

DOCTOR OF MEDICINE (M.D.)

Overview

This catalog is a general information publication only. It is not intended to nor does it contain all policies and procedures relevant to students enrolled in the Joe R. and Teresa Lozano Long School of Medicine (Long SOM). Current Long SOM students are to refer to the M.D. Degree Handbook posted in their CANVAS class cohort site (<http://www.uthscsa.edu/university/canvas/>) (*login required*) for full program policies and detailed procedures.

This publication is for informational purposes and does not constitute a contract, either expressed or implied. The Long SOM reserves the right to change any provision or requirement at any time without notice in order to ensure compliance with accreditation standards.

Policy revisions made after publication of the official UT Health San Antonio Catalog will be disseminated to students by email and posted to CANVAS class cohort sites. Students are accountable to policies herein, those in the M.D. Degree Handbook, updates posted in CANVAS, and revisions sent by email.

Notice of Nondiscriminatory Policy

The Long SOM, in compliance with applicable federal laws and regulations, and the Health Science Center Handbook of Operating Policies, Policy 4.2.1 (<https://uthealthsa.sharepoint.com/RAC/Documents/HOP/Chapter04/4.2.1.pdf>), does not discriminate on the basis of race, color, religion, sex, national origin, age, disability, citizenship, genetic information, sexual orientation, gender identity or veteran status in any of its policies, practices or procedures.

Admissions Requirements

Admission requirements are detailed online at the Long SOM, Admissions & Outreach website (<https://uthscsa.edu/medicine/education/ume/admissions/requirements/>). Applicants must have at least 90 semester hour credits from a United States or Canadian college or university with no grade lower than a C in required coursework. While not required at this time, a bachelor's degree is preferred. Web-based applications are available through the Texas Medical and Dental Schools Application Service (<https://www.tmdsas.com/>) (TMDSAS). Applicants must take the Medical College Admission Test (MCAT), the CASPer (Computerized Assessment Sample of Personal Characteristics), and submit other required documents to the TMDSAS, such as letters of recommendation and transcripts, in order to have a complete application. Refer to the TMDSAS to obtain the most current information about application instructions, and important dates and deadlines.

Jamp, Joint Admission Medical Program

<https://www.texasjamp.org/>

Acceptance & Education Requirements

The Long SOM Admissions Committee uses a holistic review process to assess each and every application. Balanced consideration is given to experiences, attributes and academic metrics. The Long SOM Admissions Committee evaluates each candidate's application to assess these elements of the holistic review and values evidence of academic strength, broad and varied experiences in healthcare, leadership and community service, and the development of an applicant's personal attributes. Demonstration of integrity, maturity, motivation, judgment, resilience, and

resourcefulness is also of value. The interview is a required component of the application process.

Applicants who are American citizens or possess official status as Permanent Residents of the U.S. or granted deferred action can be considered for interview and acceptance at this time.

Applicants are encouraged to review the Factors Considered for Applicant Interview and Acceptance (<https://www.uthscsa.edu/academics/medicine/education/ume/admissions/interview/>). All candidates must meet the required Technical Standards for Completion of the Medical Curriculum (<https://uthscsa.edu/medicine/education/ume/admissions/technical-standards/>). The Long SOM is committed to nondiscrimination policies for all populations including qualified individuals with disabilities. Please refer to Health Science Center Handbook of Operating Policies Policy 4.2.1. Nondiscrimination Policy and Complaint Procedure. (<https://uthealthsa.sharepoint.com/RAC/Documents/HOP/Chapter04/4.2.1.pdf>)

The interview selection process allows for review and re-review throughout the admissions cycle until the TMDSAS Match; applicants who did not receive an interview will be notified of this in January or at the end of the interview portion of the cycle.

The Long SOM may offer early acceptances during the TMDSAS pre-match period which usually occurs from October through December.

Other candidates may be accepted through the TMDSAS Match process, the results of which are available on the TMDSAS website in February. Acceptances may also be offered after the TMDSAS Match, from February through mid-July. An applicant receiving an offer of acceptance will be requested to show acknowledgment of the offer of acceptance, usually within two weeks of acceptance, through the Long SOM admissions software portal.

Matriculation is contingent upon satisfactory completion of all requirements, as outlined on the TMDSAS website, on the admissions website, and contained in the items listed on the Accepted Student Checklist (<https://www.uthscsa.edu/academics/medicine/education/ume/admissions/accepted/>), which includes a background check review (*see Medical Student Background Check Policy*), submission of final transcripts, completion of the degree plan, satisfactory completion of all prerequisite coursework, and presence at required matriculation events such as White Coat Ceremony and Orientation.

Medical Student Background Check Policy

Applicants who have received an offer of acceptance must complete a background check as a condition of matriculation to the Long SOM. An offer of acceptance will not be final until a background check review is performed and satisfactory results are recorded. Admission may be denied or rescinded based on the review of the background check.

Additionally, students who are currently enrolled may have to satisfactorily complete a background check as a condition to enrolling or participating in educational experiences at affiliated clinical sites as required. Students who return from a year of deferred acceptance or leave of absence may also be required to complete a background check, with subsequent review. Students who decline to complete the background check or do not pass the background check review may be dismissed from the medical education program.

Falsification of information, including omission of relevant information, may result in denial of admission or dismissal from the educational program. Refer to the full Background Check Policy (<https://>

oume.uthscsa.edu/wp-content/uploads/sites/56/2019/06/OUME_Background-Check-Req_190617_ONLINE.pdf) for more detail.

Transfer or Advance Standing Applications

The Long SOM does not accept transfer students into the Doctor of Medicine (M.D.) degree program.

Individuals whose graduate work has been in the field of dentistry may apply for advanced standing through the MD/Oral-Maxillofacial Surgery Certificate Program (<https://uthscsa.edu/dental/programs/oral-and-maxillofacial-surgery-residency/>).

Scholarships

Scholarship assistance may be available to students of the Long SOM.

Scholarships are awarded based on need, merit, or a combination of both. The Long SOM determines the selection of scholarships based on criteria established by the donor. Scholarships may be renewable depending upon academic performance and/or stated scholarship conditions.

Students can apply for scholarships online through the student portal administered by the Office of Financial Aid and Veterans Affairs.

Students must first file the Free Application for Federal Student Aid (FAFSA) in order to be considered for scholarships. The Long SOM Admissions Scholarship Committee makes recommendations for the selection of candidates for scholarships to first-time matriculants and the Long SOM Scholarship Committee makes recommendations for awards to current students. These recommendations are forwarded to the Office of Financial Aid and Veterans Affairs for processing to student accounts. If the student receives a scholarship, after he/she has been fully awarded, the Office of Financial Aid and Veterans Affairs may need to reduce other aid on the account in order to prevent an over-award of federal funds. Learn more on the Office of Financial Aid and Veterans Affairs Scholarship website. (<https://students.uthscsa.edu/financialaid/2013/04/scholarships/>)

Degree Requirements

The degree of Doctor of Medicine (M.D.) is awarded by the Board of Regents upon a student's successful completion of the degree requirements consisting of 174 total program hours, recommendation by the Student Progression & Promotion Committee to the Dean of the Long SOM, and certification by the Dean of the Long SOM to the President of UT Health San Antonio.

Candidates must:

1. be at least 18 years of age at the time the degree is awarded;
2. present evidence of good moral character;
3. offer evidence of having satisfactorily fulfilled all academic requirements of the four year medical education program;
4. comply with all necessary legal and financial requirements.

CIRCLE Curriculum

The acronym CIRCLE (Curricular Integration, Researchers, Clinicians, Leaders, Educators) represents the integrated four-year medical school education program which is described briefly below.

Preclinical Curriculum

The 19-month preclinical curriculum is taught in three foundational modules, eight sequential organ-system modules, and two longitudinal modules. Within each module there is progression of knowledge in a systematic fashion as follows: normal structure and function, pathogenesis and pathophysiology of the condition or disorder, clinical manifestations of the condition or disorder, pharmacotherapeutic interventions for the condition or disorder, clinical and translational research and evidence-based medicine approach for the condition or disorder, epidemiology or prevention of the condition or disorder, and interpretation of diagnostic tests. Each module has a weekly thematic content which is synthesized via a small group interactive patient case.

Foundational Modules:

1. Molecules to Medicine
2. Attack and Defense
3. Language of Medicine

Organ-System Modules:

1. Hematology
2. Respiratory Health
3. Circulation
4. Renal and Male Reproductive
5. Mind, Brain, and Behavior
6. Endocrine/Female Reproductive
7. Digestive Health and Nutrition
8. Form and Function: Skin, Muscles, and Bones

Longitudinal Modules:

1. Medicine, Behavior, and Society
2. Clinical Skills

Clinical Curriculum

Following successful completion of the entire preclinical curriculum students enter the clinical curriculum. This is comprised of 48 weeks of clerkships, 20 weeks of electives, eight weeks of selectives, and four weeks of didactics.

Clerkships

Students must complete 48 weeks of clerkships in eight specialties. Students will complete four-week clerkships for Emergency Medicine and Neurology; six-week clerkships for Family Medicine, Obstetrics & Gynecology, Pediatrics, and Psychiatry; and eight-week clerkships for Medicine and Surgery. Each student will assume increasing patient care responsibility commensurate with achievement of specific milestones and competencies defined by the curriculum committee. A longitudinal educational experience will be provided throughout the clerkships to cover topics that are relevant to all disciplines.

Electives/Selectives

Electives and selectives expose students to additional medical specializations and/or allow the student to return to a core specialty with advanced duties and responsibilities. Students may begin electives following the completion of the preclinical curriculum.

Selectives can be taken after the completion of the clerkships, and consist of a four-week inpatient selective and a four-week ambulatory selective. Third-year elective experiences allow students to explore other specialties and subspecialties or engage in research before fourth year while still consolidating core knowledge and skills.

MD Degrees with Distinction

The Long SOM offers additional distinction programs that a student can pursue while maintaining satisfactory achievement in the medical education program. Learn more about each by visiting the program's website.

- M.D. with Distinction in Research (<https://lsom.uthscsa.edu/office-research/research-enrichment/md-with-distinction-in-research/>)
- M.D. with Distinction in Medical Education (<https://oume.uthscsa.edu/student-affairs/md-with-distinction-in-medical-education/>)
- M.D. with Distinction in Medical Humanities (<https://www.texashumanities.org/humanities-distinction/>)

Scholastic Honors

Alpha Omega Alpha Honor Medical Society

Alpha Omega Alpha (AOA) Honor Medical Society is a national professional organization whose aims are the "promotion of scholarship and research in medical schools, the encouragement of a high standard of character and professionalism among medical students and graduates, and the recognition of high attainment and service in medical science, patient care, and related fields."

Election is based on academic excellence and on activities and achievements that promote the values of AOA. Students may be chosen in the third or fourth year. Students who are eligible for AOA in the third year must rank in the top 10% of the class, based on GPA from final grades in all preclinical courses and at least three clerkships completed by the end of the first semester of third year. Students who are eligible for AOA in the fourth year must rank in the top 25% of the graduating class, based on final GPA after completion of all eight clerkships, or achieve seven or more "Honors" grades in the clerkships (but not receive "Remediated Pass" or "Fail" grades in any course at any level). Eligible third- and fourth-year students are invited to apply for AOA with an application that highlights a student's achievements during medical school. Up to 20% of the graduating class may be elected to AOA.

Gold Humanism Honor Society

The Gold Humanism Honor Society, sponsored by the Arnold P. Gold Foundation, recognizes students who best exemplify and manifest humanism in their interactions with patients, peers, faculty and community. Additionally, elected students demonstrate excellence in clinical care, leadership, compassion and dedication to service. Society membership participates in a community service project that is formulated by the group.

Sample Plans of Study:

The tables below represent courses the students will take in their preclinical and clinical years.

Preclinical Curriculum

CIRC 5001	Medicine, Behavior and Society Longitudinal Module	6
CIRC 5003	Language of Medicine Longitudinal Module	5.4
CIRC 5005	Clinical Skills Longitudinal Module	14.75
CIRC 5007	Molecules to Medicine	9
CIRC 5009	Attack and Defense	9
CIRC 5011	Circulation	5
CIRC 5013	Respiratory Health	4
CIRC 5015	Renal and Male Reproductive	5
CIRC 5017	Hematology	3
CIRC 6007	Mind, Brain and Behavior	9
CIRC 6009	Endocrine and Female Reproductive	7
CIRC 6011	Digestive Health and Nutrition	7
CIRC 6013	Form and Function	7.5
Total Credit Hours		91.65

Clinical Curriculum

INTD 3031	Exploring Clinical Medicine- Module 1	1
INTD 3032	Exploring Clinical Medicine- Module 2	1
INTD 3033	Exploring Clinical Medicine- Module 3	1
MEDI 3105	Medicine Clerkship	8
SURG 3005	Surgery Clerkship	8
FMED 3005	Family Medicine Clerkship	6
OBGY 3005	Obstetrics/Gynecology Clerkship	6
PEDI 3005	Pediatrics Clerkship	6
PSYC 3005	Psychiatry Clerkship	6
EMED 3005	Emergency Medicine Clerkship	4
NEUR 3005	Neurology Clerkship	4
1 FOUR-WEEK SELECTIVE		4
1 FOUR-WEEK SELECTIVE (AMBULATORY CARE)		4
20 WEEKS OF ELE		20
4 WEEKS OF SENIOR DIDACTICS		3.5
Total Credit Hours		82.5

Objectives & Competencies for the Doctor of Medicine (M.D.) Degree

The objectives and competencies for the educational program for the Doctor of Medicine (M.D.) degree program were initially developed and approved by the Curriculum Committee in 2008 and reaffirmed in 2018 with minor revisions. The objectives and competencies are used to guide the curriculum and ensure that students who graduate have achieved competency in three (3) areas basic to being a physician: **Altruism**, **Knowledge**, and **Skills**.

1. **Altruism:** Medical students must be compassionate and empathetic in caring for patients, and must be trustworthy and truthful in their professional dealings. They must act with integrity, honesty, and respect for patients' privacy and dignity.

2.

Knowledge: Medical students must understand the scientific basis of medicine and be able to apply that understanding to the safe and effective practice of medicine. They must utilize self-assessment and self-knowledge to optimize their learning.

3. **Skills:** Medical students must acquire wide-ranging skills that will enable them to care for patients as a professional.

Under each area of competency there are numerous specific objectives that a medical student will be able to do by the time of graduation. View the full list of objectives and related appendices (https://oume.uthscsa.edu/wp-content/uploads/sites/56/2018/07/Objectives_Competencies_MD_revised2018.pdf) to learn more.

1. ALTRUISM:

- 1.1 List and define the basic principles guiding ethical decision-making.
- 1.2 Apply ethical concepts to medical ethical dilemmas.
- 1.3 Demonstrate respect for human dignity.
- 1.4 Provide compassionate patient care.
- 1.5 Demonstrate honesty and integrity in educational and professional interactions.
- 1.6 Demonstrate appropriate patient advocacy.
- 1.7 Understand the non-medical factors that impact health.
- 1.8 Understand the issues of access to health care.
- 1.9 Appropriately address conflicts of interest inherent to the field of medicine.

2. KNOWLEDGE:

- 2.1 Demonstrate knowledge of normal structure and function of the human body.
- 2.2 Demonstrate knowledge of the pathogenesis and pathophysiology of disease and disorders.
- 2.3 Demonstrate knowledge of the clinical manifestations of common conditions and disorders.
- 2.4 Demonstrate knowledge of the pharmacotherapeutic modalities for common conditions and disorders.
- 2.5 Demonstrate knowledge of the basic principles of clinical and translational research.
- 2.6 Demonstrate knowledge of the epidemiology of common conditions and disorders.
- 2.7 Demonstrate knowledge of systems of healthcare delivery.

3. SKILLS:

- 3.1 Obtain an accurate and complete medical history.
- 3.2 Perform all components of a complete physical examination.
- 3.3 Prepare for and perform basic clinical procedures.
- 3.4 Perform basic interpretation of commonly used diagnostic tests.
- 3.5 Recognize the typical physical exam manifestations of common medical conditions and disorders.
- 3.6 Demonstrate the skills of clinical reasoning and clinical problem solving for common conditions and disorders.
- 3.7 Create appropriate management strategies for common conditions and disorders.
- 3.8 Apply the principles of relieving total pain (physical, psychological, spiritual, social).
- 3.9 Demonstrate effective and appropriate communication of medical information, both in writing and verbally.

3.10 Demonstrate the ability and commitment to continuously improve medical knowledge and skills.

Learning Environment

The Long SOM is committed to creating an environment that promotes academic and professional success in learners and teachers at all levels. The institution strives to create an environment free of behaviors that can adversely affect the teacher-learner relationship. An environment where students, residents, fellows, faculty and staff work together, train together and promote the highest level of patient care.

All members of the Long SOM medical education community have a shared responsibility to protect the integrity of the learning environment, a right to work and learn free of unlawful discrimination, harassment and mistreatment, and to report any incident in which that positive learning environment has been compromised.

Standards of Conduct for the Teacher-Learner Relationship

• Responsibilities of teachers

Treat all learners with respect, fairness, and equality regardless of age, gender, race, ethnicity, national origin, religion, disability, or sexual orientation

• Responsibilities of learners

Treat all fellow learners and teachers with respect, fairness, and equality regardless of age, gender, race, ethnicity, national origin, religion, disability or sexual orientation

Behaviors Inappropriate to the Teacher-Learner Relationship

Behaviors that demonstrate disrespect for others or lack of professionalism in interpersonal conduct are inappropriate and will not be tolerated by the institution. These include, but are not limited to, the following:

- unwanted physical contact (e.g. hitting, slapping, kicking, pushing) or threat of the same;
- unwanted verbal contact including loss of personal civility such as shouting, personal attacks, insults, or displays of temper (such as throwing objects);
- sexual harassment (including romantic relationships between teachers and learners in which the teacher has authority over the learner's academic progress) or harassment based on age, gender, race, ethnicity, national origin, religion, disability or sexual orientation;
- discrimination of any form including in teaching and assessment based upon age, gender, race, ethnicity, national origin, religion, disability or sexual orientation;
- requests for others to perform inappropriate personal errands unrelated to the didactic, investigational or clinical situation at hand;
- grading/evaluation on factors unrelated to performance, effort, or level of achievement;
- providing health and/or psychiatric or psychological services to any student for which a teacher is involved in the academic assessment or in decisions about the promotion of that student, except in an emergency situation.

Reporting Inappropriate Conduct

General reporting processes and procedures for learners and teachers are outlined in the Standards of Conduct for Teacher-Learner Relationship and the Learning Environment policy (https://www.uthscsa.edu/sites/default/files/2018/oume_policy_standards_conduct_teacher_learner_relationship.pdf). The underlying concern is for the comfort of the individual raising the concern. The Long SOM will not tolerate any form of retaliatory conduct by or toward teachers or learners who report inappropriate conduct in good faith. Individuals who believe that retaliatory action has been taken against them as a result of reporting or raising a concern regarding inappropriate conduct, may report such action through the procedures set forth in the aforementioned policy.

Non-Involvement of Healthcare Providers in Student Assessment

The Non-Involvement of Healthcare Providers in Student Assessment policy (https://www.uthscsa.edu/sites/default/files/2018/oume_policy_non-involvement_healthcare_providers_student_assessment.pdf) is established to ensure that students are evaluated based on common agreed upon performance measures that are independent of confidential or protected health information. This is essential to ensure that student academic performance is evaluated properly and to ensure that students are not discouraged from seeking medical and/or psychological/psychiatric care that is held in the strictest standards of patient privacy and confidentiality, without concern for consequent adverse actions or repercussions.

Students and health care providers should follow these procedures to make certain that the appropriate care is sought and provided.

Health care professionals who provide medical and/or psychological/psychiatric care to medical students must:

- have no role in the formal academic or professionalism evaluation of medical students at the present or future time.
- have no role in advancement/progression/graduation of medical students at the present or future time.
- recuse herself/himself from the formal academic or professionalism evaluation of medical students and from academic or professionalism decisions of advancement/progression/graduation of medical students, if a dual relationship with medical students is anticipated or is discovered, and, when appropriate and without breaching confidentiality, alert the dean for student affairs immediately.

Students should:

- **seek medical care through the Wellness 360^o.** This medical care is usually provided by registered nurses or advanced nurse practitioners under the supervision of the SHWC medical director. The health care providers in the SHWC may refer medical students to other academic or community health care providers for further/follow-up care.
- **seek psychological/psychiatric care through the Student Counseling Center (SCC).** A multidisciplinary staff, who is not involved in academic or professionalism evaluation and/or decisions of advancement/progression through the curriculum, provides evaluation and short-term treatment including counseling,

psychotherapy, and medication management when necessary to medical students with mental health, situational, social or academic concerns. The health care providers in the SCC may refer medical students to other academic or community health care providers for further/follow-up care.

- **Inform staff in the SHWC and SCC that they are students at the Long SOM.**

Student Mistreatment

Mistreatment of students will not be tolerated. Mistreatment, intentional or unintentional, occurs when behavior shows disrespect for the dignity of others and interferes with the learning process. Student mistreatment may take many forms all of which impact student performance. Sexual harassment and assault, which are defined by policy (<https://uthealthsa.sharepoint.com/RAC/Documents/HOP/Chapter04/4.2.2.pdf>) through UT Health San Antonio's Equal Employment Opportunity/Affirmative Action Office, are included in this section as forms of student mistreatment**. Student access to personnel and processes for resolution without retaliation are detailed in the Student Mistreatment Policy (https://www.uthscsa.edu/sites/default/files/2018/oume_student_mistreatment_policy.pdf). Per policy, a student who has a grievance concerning perceived violation of her/his student rights; discrimination based on age, color, disability*, family status, gender, national origin, race, religion, veteran status, sexual orientation; or sexual harassment/sexual assault** may seek resolution through an informal or formal process. Examples of behavior that are unacceptable to the Long SOM and UT Health San Antonio include:

- Physical or sexual harassment/assault
- Discrimination or harassment based on race, gender, age, ethnicity, religious beliefs, sexual orientation, or disability
- Disparaging or demeaning comments about an individual or group
- Loss of personal civility including shouting, displays of temper, public or private abuse, belittling, or humiliation
- Use of grading or other forms of evaluation in a punitive or retaliatory manner
- Sending students on inappropriate errands

Medical students who feel they have been mistreated may report such perceptions to any of the following:

- Associate Dean for Student Affairs
- Student Ombudsperson
- Chief Student Affairs Officer/Title IX Director
- Student Counseling Center
- Office of Student Life
- Course/Clerkship Director

These school representatives are empowered to informally discuss a student's perceptions related to mistreatment, providing guidance. These school representatives should refer the student immediately to the associate dean for student affairs for further instructions.

*see additional related health science center policies/procedures: Nondiscrimination Policy and Complaint Procedure (<https://uthscsa.edu/university/notice-of-non-discrimination/>)

**see additional related health science center policies/procedures:
Sexual Misconduct Policy (<http://catalog.uthscsa.edu/generalinformation/sexualmisconduct/>)

Code of Professional Conduct

Medical students are expected to maintain the highest standards of professional and ethical conduct. Medical students are expected to conduct themselves in a professional manner in interaction not only with patients, but also with peers, faculty and staff of the health science center and the broader community. The Long SOM, health science center and UT System have written expectations of professional conduct. The Code of Professional Conduct (https://oume.uthscsa.edu/wp-content/uploads/sites/56/2018/07/Code-of-Professional-Conduct_2018.pdf) in the Long SOM governs the expected behavior of medical students. Each module, clerkship or course director may also develop additional written expectations of professional conduct.

A report of professional misconduct is investigated in accordance with applicable Long SOM, health science center and the UT System policy. Any potential violation of professional conduct is reported to the associate dean for student affairs for investigation. The associate dean for student affairs will be responsible for ensuring that no retaliation is made against the complainant. The associate dean for student affairs will interview both the complainant and the accused student, allowing the accused student the opportunity to respond to the charges and to review the available evidence supporting the charges. The associate dean for student affairs will interview others as indicated. All health science center personnel and students must cooperate with the investigation. At the conclusion of the investigation, the associate dean for student affairs will prepare a written report detailing the charges, the investigative process and the results of the investigation. The associate dean for student affairs will present the written report to the Student Progression and Promotion Committee (SPPC) for recommendations. Any disciplinary action/sanction(s) recommended by the SPPC shall be in accordance with the Long SOM Administration of Code of Professional Conduct for Students policy (https://www.uthscsa.edu/sites/default/files/2018/sppc_admin_professional_code.pdf) and applicable health science center policies. The decision of the SPPC is final, pending further appeal to the dean of the Long SOM as outlined in the Appeal Process for an Academic Grievance policy (https://www.uthscsa.edu/sites/default/files/2018/oume_academic_grievance_process.pdf).

Grades

The Curriculum Committee (CC) is the faculty body that provides central oversight and makes recommendations to the dean and dean delegates for the overall design, management and evaluation of a coherent and coordinated curriculum. The Student Progression and Promotions Committee (SPPC) is the faculty body charged with review of the academic progress and professional development of each student during all components of the medical education program. The SPPC has primary responsibility for recommending for graduation only those candidates who have satisfactorily completed all graduation requirements and demonstrated the professional conduct appropriate for a physician.

The preclinical phase includes modules taught from the beginning of the first academic year through mid-spring of the second academic year. The clinical phase includes all clerkships and selective/elective courses. The module director determines the academic standards for successful completion of a preclinical module, adhering to a grading rubric approved

by the CC. In the clinical years, academic standards for successful completion of a clerkship or selective/elective are determined by the clerkship or course director, remaining within the bounds of applicable CC standardization and approval.

The preclinical and clinical education leaders in accordance with the CC policy and Office for Undergraduate Medical Education (OUME) standards set the grade composition for preclinical modules and clerkships. Per the Timely Reporting of Grades to Students policy (https://www.uthscsa.edu/sites/default/files/2018/cc_policy_timely_reporting_final_grades.pdf), final grades in the preclinical curriculum must be made available to students within 4 weeks of the last day of the module/course. Final clerkship grades must be made available to students within 6 weeks of the last day of the clerkship. Final grades in the curriculum are submitted to the OUME and ratified by the SPPC.

Grading

All module and clerkship grades are based on Honors, High Pass, Pass, Fail system. Grades of Honors, High Pass, and Pass are considered passing. The grade of Incomplete (I) is reserved for circumstances in which academic work is not completed due to illness, family emergency, or other non-academic extenuating circumstances.

Assignment of Final Module Grade: All activities that contribute to the final module grade will be entered into a grade calculator maintained and managed by the Office of UME, and the point total will convert to a grade as follows:

- **Honors** = 90.00-100 and all Components meet "Honors" benchmarks
- **High Pass** = 85.00-89.99 and all Components meet "High Pass" benchmarks
- **Pass** = 70.00-84.99 OR >84.99 points but did not meet all benchmarks for "High Pass"
- **Fail** = 0-69.99 or failure of one or more individual components

For purposes of class rank, each letter grade is assigned a point value as follows:

Letter Grade	Grade Point Average
Honors	4 points
High Pass	3.5 points
Pass	3 points
Remediated Pass	2 points
Fail	0 points

Remediation grades (as described below) will be classified as Remediated Pass and class rank will be calculated twice during the four-year medical education program as follows: 1) at the conclusion of the preclinical curriculum 2) at the date that the clerkships must be completed during the clinical years.

Grades for Electives and Selectives

Grades for electives and selectives are based on a pass/fail system. Clinical course student assessment is based on competency and professionalism as per the individual elective or selective grading rubric.

Academic Progression

General Academic Progression and Professionalism Requirements

Per the General Academic Progression and Professionalism Requirements for the the Doctor of Medicine (M.D.) Degree Program policy (https://www.uthscsa.edu/sites/default/files/2018/sppc_policy_general_progression_professionalism_reqs.pdf), students who fail to meet minimum passing standards at the conclusion of any Long SOM course are subject to review of their performance in previous coursework. Failure to meet minimum passing standards in more than one course between the time of matriculation and graduation may result in the student being required to repeat a portion of the curriculum or may result in dismissal. Students who fail to complete all degree requirements within six years from matriculation may meet criteria for dismissal. Students who exhibit unprofessional behavior may be subject to dismissal.

The Student Progression and Promotion Committee (SPPC) monitors student progression, promotion, and professional development leading to successful completion of the M.D. degree program. The SPPC ensures uniformity in promotion and graduation by executing established policies related to student advancement and professionalism expectations that are universally applied to all medical students. In this role, the SPPC has the authority to:

- mandate a leave of absence (LOA) for a student,
- mandate that a student meet with the associate dean for student affairs and/or the associate dean for curriculum,
- restrict the extracurricular activities of a student, including removal from an office or leadership position the student may hold, and/or
- dismiss a student from the program.

Policy on Academic Progression - by individual year

All students are subject to the Impact of Course Failure on Academic Progression policy (https://www.uthscsa.edu/sites/default/files/2018/cc_policy_course_failure_impact.pdf). Students should be aware that they are subject to dismissal if they fail to meet satisfactory academic progression requirements. Students should reference the above policy for details regarding the impact of course failures.

Student Progress Based on NBME Comprehensive Basic Science Exam Performance

The National Board of Medical Examiners (NBME) offers the Comprehensive Basic Science Exam (CBSE), an achievement test covering material typically learned during basic science education. The CBSE is designed to reflect the content of USMLE Step 1 exam, and is typically used to gauge readiness for USMLE Step 1 and to identify areas of individual strength and weakness in basic science material. Scores on CBSE can be correlated to scores on USMLE Step 1. The Long SOM has established policies pertaining to successful performance on the CBSE prior to taking the USMLE Step 1 in order to ensure that graduates meet at least minimal licensing requirements and to optimize career outcomes for our students.

All students must take the CBSE at the conclusion of the preclinical phase of the curriculum at a date and time established by the Office for Undergraduate Medical Education (OUME). Students are required to meet score benchmarks established by the OUME in order to progress to the

clinical/elective phase of the curriculum, including clerkships. Inability to test on the established testing date may delay planned coursework. Students who miss testing will be placed in a USMLE Step 1 readiness pathway and will be scheduled to take the CBSE at the next offered opportunity. See Student Progress Based on NBME Comprehensive Basic Science Exam Performance policy (https://www.uthscsa.edu/sites/default/files/2018/sppc_cbse_requirements.pdf).

United States Medical Licensing Examination

The United States Medical Licensing Examination (USMLE) is jointly sponsored by the NBME and the Federation of State Medical Boards. A passing score on each portion of the USMLE is accepted by medical boards in every state as evidence of core competency to practice medicine. The current required exams are USMLE Step 1, USMLE Step 2 CK (Clinical Knowledge), and USMLE Step 3. The USMLE Step 3 is taken after medical school graduation.

It is essential that medical students meet required benchmarks that lead to medical licensure. Although designed for the purpose of licensing physicians, scores on USMLE Step 1 and USMLE Step 2 CK are often used by graduate medical education programs in decisions to interview and rank medical students for residency positions. It is, therefore, incumbent upon the SOM to establish policies pertaining to the timing and passage of the USMLE in order to optimize career outcomes for students and to ensure that graduates meet at least minimal licensing requirements.

Student must pass the USMLE Step 1 and Step 2 CK in order to graduate from the Long School of Medicine per policies governing the number of attempts on each USMLE step exam. See the relevant policy listed below (**UTHSA login required*):

- Requirements for USMLE Step 1 exam (https://www.uthscsa.edu/sites/default/files/2018/cc_usmle_step1_requirements.pdf)
- Requirements for USMLE Step 2 CK exam (https://www.uthscsa.edu/sites/default/files/2018/cc_usmle_step2ck_requirements.pdf)

Appeal Process for an Academic Grievance

An academic grievance is a complaint regarding an academic decision or action that may affect the student's academic record and or concerns adversely influencing the student's academic status. Examples include, but are not limited to, examination score, module, course or clerkship grades, clinical course narrative comments, remediation, repetition, suspension, probation, professionalism sanctions, and dismissal. A medical student may choose to resolve an academic grievance in the preclinical and clinical phases of the curriculum through either an informal or formal appeal process. An informal appeal process allows a student to pursue resolution of a grievance directly within the administrative structure of a course (i.e. through the associate dean for curriculum in the preclinical curriculum or the clerkship director/course director in the clinical curriculum), while a formal appeal process allows a student to pursue resolution of a grievance through the medical school's Student Progression and Promotions Committee (SPPC). The Appeal Process for an Academic Grievance policy (<https://www.uthscsa.edu/>)

sites/default/files/2018/oume_academic_grievance_process.pdf) defines the procedure and timeline for each option.

Adverse Action Policy

An adverse action is any action taken by the Student Progression and Promotion Committee (SPPC) that affects the status of a student. These actions include dismissal, a mandated leave of absence, repetition of a year of the curriculum and any action that would affect a student's standard progression through the curriculum. As stated in the Appeal Process for an Academic Grievance policy (https://www.uthscsa.edu/sites/default/files/2018/oume_academic_grievance_process.pdf) and Student Mistreatment Policy (https://www.uthscsa.edu/sites/default/files/2018/oume_student_mistreatment_policy.pdf), a medical student may choose to resolve an academic or non-academic grievance through either an informal or formal appeal process. However, adverse actions require special attention that include an opportunity to respond to the impending action that relates to advancement, graduation, or dismissal. In those cases, this policy takes precedence over other appeal processes.

A student facing an adverse action that relates to advancement, graduation, or dismissal will have an opportunity to respond to the impending action, including the option to appear before the Student Progression & Promotion committee (SPPC) PRIOR to any SPPC decision. The Adverse Action policy (https://www.uthscsa.edu/sites/default/files/2018/sppc_adverse_action_policy.pdf) defines the procedure and timeline for a student wishing to respond to an impending adverse action.

Courses

ANES 4000. Special Topic. 4 Credit Hours.

This is a self-designed course created by both the student and the department to cover a specific topic. A Course Approval Form must be completed along with documentation of the designed course description.

ANES 4001. Clinical Anesthesiology. 4 Credit Hours.

Students are required to participate in Anesthesiology at one of the general hospitals affiliated with The University of Texas Health Science Center at San Antonio with supervised, graded responsibility for anesthetic management during all phases of the peri-operative period. Objectives are to develop skills for physical assessment, choice of anesthetic management, administration of anesthesia, airway maintenance, and basic life support of the anesthetized patient.

ANES 4002. Critical Care. 4 Credit Hours.

Students are required to participate in the adult surgical intensive care unit at Audie Murphy VA Hospital. Emphasis will be placed on the diagnosis and treatment of all aspects of acute respiratory failure, especially that occurring in the postoperative state, including post-cardiac surgery. The principles of pulmonary, renal, cardiac, and nutritional support will be discussed. The ethics of life support are also discussed.

ANES 4004. Obstetrical/Analgesia Mgmt. 4 Credit Hours.

Students will participate in the Obstetric Anesthesiology department at University Hospital. Teaching will emphasize practical care with the student taking an active part in the monitoring of and assisting in the anesthetic care of healthy or complicated women in labor, as well as those undergoing cesarean section. Students will have the opportunity to perform intubations, epidurals, and spinals. Management of GYN outpatient anesthesia will also be included. Emergency resuscitation for hypotension, convulsions, aspiration, and respiratory cardiac arrest may be reviewed as well as prophylactic measures for the prevention of these conditions.

ANES 4005. Pain Management. 4 Credit Hours.

Students participate in the University Center for Pain Medicine at University Hospital managing chronic pain patients using a multi-disciplinary approach. Students will be exposed to areas of pain management that include operative vs. non-operative options for chronic pain patients and physical therapy and mobilization techniques. Student's responsibilities include evaluating new patient with a focused and detailed physical exam, seeing follow up patients for medication management, and managing patient pre, during, and post procedures. The student is required to become proficient in accurately evaluating back pain, neuropathies, radiculopathies, and pain diseases including regional complex pain syndromes. This rotation is designed for any student, especially those interested in primary care, anesthesiology, orthopedics, neurology, neurosurgery, or chronic pain management.

ANES 4008. Cardiothoracic Anesthesia. 4 Credit Hours.

Students will be involved in care of the cardiothoracic patients at University Hospital. Emphasis will be on anesthesia for patients with cardiovascular and thoracic disease, cardiopulmonary physiology and pharmacology, and invasive hemodynamic monitoring. Students will work directly with one of the cardiothoracic faculty in the Anesthesiology Department.

ANES 4009. Regional Anesthesia and Acute Pain. 4 Credit Hours.

Students will be involved in the care of patients on the acute pain service and of regional anesthesia patients at University Hospital with direct supervision by the acute pain and regional anesthesia faculty. Emphasis will be on orthopedic procedures requiring regional blocks, surgeries, epidural or spinal placements, and management of an acute pain service, including medication management. Students will also have an option for one week exposure to chronic pain at the UT Medicine Pain Clinic with three weeks on the acute pain service. The student would need a basic understanding of the sedation used for blocks, along with medications used for pain during and after surgery. Eligible students have an understanding of anesthetic requirements for surgery, context on when blocks may be indicated, and experience seeing blocks used successfully in the ORs. As a prerequisite, this course is recommended for students who have a strong career interest in Anesthesiology and have completed at least one MS3 or MS4 rotation in Clinical Anesthesiology.

ANES 4010. 9th Floor ICU. 4 Credit Hours.

Students are required to participate in caring for post-transplant (liver, kidney, and lung) and post-cardiac patients as well as those needing extra-corporeal membrane oxygenation (ECMO) on the 9th Floor ICU at University Hospital. Students will learn about relevant neurologic, cardiovascular, respiratory, gastrointestinal, hematologic, endocrine, and renal pathophysiology and treatment in these postoperative conditions. Emphasis will be placed on the diagnosis and treatment of all aspects of acute respiratory failure, especially that occurring in the postoperative state, including post-cardiac surgery. The ethics of life support are also discussed.

ANES 4103. Critical Appraisal of the Medical Literature. 4 Credit Hours.
Students will initially be introduced to the principles of evidence-based medicine through online lectures. They will participate in online activities and discussions to further facilitate learning. Throughout the course, students will prepare for a final small group presentation at Journal Club, which will take place at the end of the course. At Journal Club, students will present their article and participate in discussion of their peers' articles.

ANES 6081. Anesthesia Rotation. 1.5 Credit Hour.
Students rotate through the operating room and peri-operative patient areas of the hospital to evaluate patients undergoing general anesthesia and deep conscious sedation. The primary purposes of this clinical rotation are to allow the student to become comfortable with airway management and patient monitoring.

ANES 7000. Off Campus. 4 Credit Hours.
All off-campus rotations must be approved by the designated faculty member prior to the beginning of the rotation (at least one week before the course begins). Credit will not be given for any rotation that has not been approved in advance. Required paperwork includes: the Course Approval form, a written letter or email for acceptance from the physician preceptor with the start and end dates of the course/rotation, and a course description of your learning objectives and responsibilities during the rotation. Forms must include a complete address and telephone number for the off-campus location or residence address for the student while at the off-campus site. Forms will not be approved after the rotation has already begun. Contact the department for assistance with enrolling in this course.

Courses

BIOC 0003. Scientific Writing: Development and Defense of a Research Proposal. 2 Credit Hours.

The course consists of writing a progress report describing research results during the last year. The course is required of all graduate students beginning the first semester after selection of a supervising professor.

BIOC 4000. Special Topic. 4 Credit Hours.
This is a self-designed course created by both the student and the department to cover a specific topic. A Course Approval Form must be completed along with documentation of the designed course description.

BIOC 5083. Hydrodynamic Methods. 2 Credit Hours.
This course is intended to provide students with the opportunity to gain a solid understanding of hydrodynamics and macromolecular transport processes, such as sedimentation and diffusion. The focus will be on hydrodynamic methods involving analytical ultracentrifugation and light scattering. Topics in sedimentation velocity, sedimentation equilibrium, buoyant density sedimentation, as well as static and dynamic light scattering and the complementarity of these approaches will be discussed. Macromolecular interactions involving mass action, concentration dependent nonideality and reaction rates are covered. This course will also cover a range of data analysis approaches including the van Holde-Weischet method, the second moment method, direct boundary fitting by finite element modeling, the C(s) method, the 2-dimensional spectrum analysis, genetic algorithm optimization and nonlinear least squares fitting approaches to user-defined models. Statistical analysis using Monte Carlo and bootstrap methods will also be covered. Open for Cross Enrollment on Space Available Basis.

BIOC 5085. Biophysical Methods In Biology. 2 Credit Hours.
This course is required for all students enrolled in the Molecular Biophysics and Biochemistry track. The course covers modern biophysical methods for studying biological macromolecules in sufficient detail to understand the current literature. Topics to be covered include macromolecular structure determination by X-ray crystallography and NMR spectroscopy; absorbance, fluorescence, and EPR spectroscopy; circular dichroism; light scattering; mass spectrometry; and hydrodynamics, including diffusion, electrophoresis, sedimentation velocity, and sedimentation equilibrium. Open for Cross Enrollment on Space Available Basis.

BIOC 5087. Molecular Genetics And Biotechnology. 1 Credit Hour.
This course is required for all students enrolled in either Molecular Biophysics & Biochemistry Track. The objective of this course is to provide comprehensive treatment approaches to experimental biochemistry and biophysics rooted in genetics, recombinant DNA technology, and genomics.

BIOC 5091. Special Topics In Biochemistry: Hydrodynamic Methods. 1 Credit Hour.
This course is intended to provide students with the opportunity to gain a solid understanding of hydrodynamics and macromolecular transport processes, such as sedimentation and diffusion. The focus will be on hydrodynamic methods involving analytical ultracentrifugation and light scattering. Topics in sedimentation velocity, sedimentation equilibrium, buoyant density sedimentation, as well as static and dynamic light scattering and the complementarity of these approaches will be discussed. Macromolecular interactions involving mass action, concentration dependent nonideality, and reaction rates are covered. This course will also cover a range of data analysis approaches including the van Holde-Weischet method, the second moment method, direct boundary fitting by finite element modeling, the C(s) method, the 2-dimensional spectrum analysis, genetic algorithm optimization, nonlinear least squares fitting approaches to user-defined models. Statistical analysis using Monte Carlo and bootstrap methods also will be covered.

BIOC 5092. Nuclear Magnetic Resonance Spectroscopy For Biochemists. 2 Credit Hours.
This course provides a working knowledge of the basic underlying theory of modern pulsed Nuclear Magnetic Resonance methods in the study of the structures and internal dynamics of biological macromolecules in solution. The theoretical concepts to be covered include an overview of pulse excitation, digital sampling, and Fourier transformation. The product operator formalism will be used to describe how modern multinuclear multidimensional pulse methods function to yield the desired signals. The practical concepts to be covered will include an overview of modern methods for obtaining sequential resonance assignments, determining high-resolution three-dimensional structures, and analyzing internal dynamics.

BIOC 5093. Data Analysis In Biochemistry And Biophysics. 1 Credit Hour.

This course is required for all students enrolled in either Molecular Biophysics & Biochemistry Track, or the Diabetes & Metabolic Disorders Track, and is open to all students enrolled in the Integrated Multidisciplinary Graduate Program. The course covers statistical and mathematical analysis of typical biochemical data. Topics to be discussed include: enzyme kinetics, first and second order chemical reactions, ligand binding, scintillation counting of radioactivity, UV-VIS difference and derivative spectra, analytical ultra-sedimentation, and solution of multiple simultaneous equations using matrix algebra. Emphasis is placed upon the use of computers to analyze experimental data using programs running under Windows, or Linux platforms. Students will also become familiar with file transfers between these two platforms and the use of VNC viewer to enable their PC computers to be used as a Linux terminal.

BIOC 5094. Research Presentations and Career Opportunities. 1 Credit Hour.

The goal of the course is to provide students with continuous experience in (1) formal presentation of their ongoing research progress; (2) exposure to various career opportunities through guest speakers; and (3) discussion and critical analysis of current scientific literature should time allow. The course meets weekly with all second-year students cycling through to make research presentations, with interspersed guest presentations on career opportunities and student presentations of journal articles by 1st-year students selected from the student's area of research interest, but also of relevance to the whole class.

BIOC 6010. Gene Expression and Omics. 2 Credit Hours.

This course presents 1) the principles of gene expression, including transcription, epigenetic regulation (histone modifications and DNA methylation), mRNA processing and degradation, translation, post-translational modifications, and protein degradation, and 2) the omics approaches for collective characterization and quantification of different aspects of gene expression, including genomics, epigenomics, proteomics, and metabolomics. Two main teaching formats are used in this course: 1) Didactic lectures in which information is delivered to the class, and 2) Paper presentations and discussions, in which students present assigned papers and lead discussions by the entire class. Although one student will present each paper, all students will be expected to read each paper and to be prepared to discuss it in the form of comments and questions. Prerequisites: Permission of the Course Director and IBMS 5000 (or equivalent).

BIOC 6015. Metabolic Disorders. 2 Credit Hours.

This course will present an introduction to dysfunctions in normal metabolic processes that lead to major human disorders and pathologies. Major topics to be covered include the causes and pathogenesis associated with Type 2 diabetes, obesity, and related hormonal signaling pathways. Other topics will focus on lipid and protein metabolic disorders, and on dysfunctions associated with mitochondrial and extracellular matrix defects.

BIOC 6029. MBB Journal Club and Student Research Presentations. 2 Credit Hours.

To be taken by all graduate students in the MBB track each semester starting with the second year. Students will each make one presentation per semester. Presentations will typically be of a recent journal article in the area of biochemistry or biophysics. Journal articles for presentations must be approved by the instructor. With permission, a student may present a summary of his or her doctoral research. In the Spring semester of their third year, students will present a review of literature relevant to their doctoral research. Grading will be based on both the presentation and involvement in class discussion.

BIOC 6033. Cell Signaling Mechanisms. 2 Credit Hours.

This course covers the molecular mechanisms of action of various extracellular mediators including hormones, neurotransmitters, growth factors, cytokines, etc., and cell signaling events. Several areas will be discussed including: (1) mechanisms of mediator synthesis; (2) interaction of mediators with specific receptors; (3) modulation by mediators of various second messenger systems including cyclic nucleotides, inositol phospholipids, calcium, protein phosphorylation, ion flux, etc.; and (4) intra- and intercellular mechanism for regulating mediator action. Open for Cross Enrollment on Space Available Basis.

BIOC 6035. Target Identification and Hit/Lead Discovery. 2 Credit Hours.

This course provides students with an understanding of the overall process of drug discovery and development. It covers the principles of target identification and validation, the basic methods of drug development, the physical biochemistry of how drugs interact with their biological targets, the role of protein structures in drug-protein interactions, the application of medicinal chemistry in lead optimization, and the development of biologicals like antibodies, vaccines, and RNAs for therapeutics. Focused lectures on specific therapeutic areas will include anti-parasite drug development and drug development for cancer. Prerequisites for the course is at the discretion of the course directors, based on adequate undergraduate courses in chemistry, biochemistry and mathematics. Open for Cross Enrollment on Space Available Basis.

BIOC 6036. Macromolecular Structure & Mechanism. 2 Credit Hours.

This course will cover the fundamentals of protein and nucleic acid structure and of enzyme catalysis. The course is required of students in the Molecular Biochemistry and Biophysics Track. Topics to be covered include: DNA and RNA structure, protein structure, protein folding, ligand binding by proteins, and enzyme catalysis. Open for Cross Enrollment on Space Available Basis.

BIOC 6037. Integration Of Metabolic Pathways. 2 Credit Hours.

The course is required of students in the Molecular Biophysics and Metabolic Pathways track. The objective is to provide an understanding of the individual reactions in intermediary metabolism and how the reactions are integrated by regulatory mechanisms. Topics include carbohydrate, lipid, and nitrogen metabolism and mechanisms of regulation of individual enzymes and metabolic pathways. Open for Cross Enrollment on Space Available Basis.

BIOC 6038. Surface Plasmon Resonance Workshop. 0.5 Credit Hours.

Surface plasmon resonance can be used to measure the equilibrium and rate constants of a variety of biomolecular interactions, including protein-protein, protein-small molecule, protein-nucleic acid and protein-phospholipid. In this laboratory intensive workshop, students will be exposed to the principles of experimental design, data collection, and data analysis utilizing state of the art instrumentation and model interactions.

BIOC 6043. Structure & Function Of Membrane Proteins. 2 Credit Hours.

This is a course targeted at students within any of the Graduate Tracks. The objective is to provide a broad view, allowing for in depth consideration in selected areas, of the structure and diverse functions of proteins within a membrane environment. Specific topics covered will include: ion selective channels, large membrane pores, membrane transporters, membrane pumps, and membrane receptors. The format of the course will be didactic lecture followed by student presentations of relevant topics. Open for Cross Enrollment on Space Available Basis.

BIOC 6069. Contemporary Biochemistry Student Review. 1 Credit Hour.

The course has two aspects. In the first, students will have the opportunity to put together a didactic lecture on a biochemical topic, essentially an oral review. Alternatively, students who attend a scientific meeting may pick a theme that was presented at that meeting in any of multiple venues (symposia, platform presentations, posters) and develop it as a presentation equivalent to an oral review. In each case, students will research the background of the material and present the latest findings. This is not intended to be a journal club but rather a didactic or teaching lecture. The course Director will work with the students ahead of time to assist them in preparing their presentation. The second aspect is that students who are not themselves presenting are required to attend the presentations. Biochemistry students must present at least once in years 3.5 of their matriculation in order to graduate with the Ph.D. degree. May be repeated for credit.

BIOC 6071. Supervised Teaching. 1-9 Credit Hours.

This course consists of teaching medical or dental biochemistry under close supervision of instructors. Management of small conference teaching groups as well as formal lecture presentations will be included.

BIOC 6098. Thesis. 1-12 Credit Hours.

Registration for a least one term is required of M.S. candidates.

Courses

CIRC 5001. Medicine, Behavior and Society Longitudinal Module. 6 Credit Hours.

The Medicine, Behavior, and Society module explores the areas of history, law, ethics, clinical, social and cultural contexts of medicine as well as human behavior & development over the lifespan (cognitive, social and emotional development from infancy to death.) The course will focus on global issues such as the health care system and on local issues such as the physician-patient relationship. Students will be introduced to communication skills, professionalism, research, and cultural competency.

CIRC 5003. Language of Medicine Longitudinal Module. 5.4 Credit Hours.

The Language of Medicine component of the curriculum serves as the common denominator necessary for students to be able to discuss systematic anatomy in the integrated modules to follow. Basic structure, conceptual anatomical principles and development of the human body presented. Knowledge is acquired in didactic sessions emphasizing clinical relevance, reinforced by practical application during laboratory sessions in which supervised cadaver dissection is performed by the students. Imaging techniques, prosections, demonstrations, and presentations by clinical specialists supplement the laboratory work.

CIRC 5005. Clinical Skills Longitudinal Module. 14.75 Credit Hours.

The Clinical Skills Longitudinal module threads throughout the entire first and second year curriculum. Using standardized and real patients, students learn medical history taking and physical examination techniques. In addition, through didactic sessions, simulations, small group sessions and labs, students master the knowledge, communication skills, professional, and interpersonal skills necessary for fostering positive doctor-patient relationships.

CIRC 5007. Molecules to Medicine. 9 Credit Hours.

The Molecules to Medicine module provides the foundation for subsequent courses and clinical practice. Through active, collaborative learning activities which may include, but are not limited to, laboratory, small group, and clinical case sessions the students gain a deeper understanding of the homeostatic structure of molecules, cells, and tissues. Students develop problem-solving skills in a multidisciplinary approach to human health and disease.

CIRC 5009. Attack and Defense. 9 Credit Hours.

The Attack and Defense module is an integrated and innovative look at microbiology, immunology, and infectious disease including public and international health issues. Students are prepared for clinical encounters requiring diagnosis, treatment, and preventive measures for immunological conditions and disorders and infectious diseases by fostering critical thinking skills. The learning environment promotes professional identity formation, effective communication and professionalism. Students acquire a broad understanding of normal and abnormal immune system function through active, collaborative learning activities which may include, but are not limited to laboratory, small group, and clinical case sessions.

CIRC 5011. Circulation. 5 Credit Hours.

The Circulation module provides an integrated approach to the basic and clinical science concepts related to the cardiovascular and hematopoietic systems. Students acquire a broad understanding of normal structure and function of the cardiovascular and hematopoietic systems including the cardiac cycle, cardiovascular pressures and flows, nutrients and oxygen delivery, hematopoiesis, and the hemostasis system through active, collaborative learning activities which may include, but are not limited to, laboratory, small group, and clinical case sessions. A comprehensive, multidisciplinary overview of the pathophysiology, epidemiology, biostatistics, interpretation of diagnostic tests, and pharmacotherapeutic and other therapeutic principles related to cardiovascular and hematopoietic disorders is included.

CIRC 5013. Respiratory Health. 4 Credit Hours.

The Respiratory Health module integrates basic science and clinical concepts related to respiratory health disease. A comprehensive study is conducted of the normal structure and function, pathophysiology/pathology, clinical manifestations, and interpretation of diagnostic tests for respiratory diseases. The student is immersed in a multidisciplinary study of pharmacotherapeutic approaches to treatment, interventional therapies, the use of evidence-based medicine and research, epidemiology, and prevention in the field of respiratory health. Students acquire a broad understanding of normal and abnormal respiratory system function through active, collaborative learning activities which may include, but are not limited to laboratory, small group, and clinical case sessions.

CIRC 5015. Renal and Male Reproductive. 5 Credit Hours.

The Renal and Male Reproductive module is a comprehensive overview of the structural and urologic components of the renal and the male reproductive system. Students gain a deeper understanding of glomerular and tubular function and pathology, as well as acute and chronic kidney injury and also benefit from a multidisciplinary approach represented by adult and pediatrics, and biochemistry. A broad understanding of normal and abnormal renal and male reproductive system function is achieved through active, collaborative learning activities that may include, but are not limited to laboratory, small group, and clinical case sessions.

CIRC 5017. Hematology. 3 Credit Hours.

The goal of this course is to expose students to the pathogenesis and pathophysiology of disease and disorders as they pertain to the specialty of hematology. During the module, the first year medical students will come to appreciate the basic science foundation for the clinical practice of Hematology. Students will gain an understanding of the medical non-medical factors that effect the hematology system.

CIRC 6007. Mind, Brain and Behavior. 9 Credit Hours.

Mind, Brain, and Behavior module provides a comprehensive introduction to the normal anatomy, development, physiology and radiological features of the human nervous system and its pathologic disorders. Through active learning methods, students will practice clinical assessment of the nervous system while learning the major features of common neurological, neurosurgical, psychiatric and psychological disorders and pharmacological approach for the nature of the experience of the brain. The student will gain an appreciation for the nature of the experience of having an illness affecting the brain and mind, and a deepened compassion for patients with these illnesses.

CIRC 6009. Endocrine and Female Reproductive. 7 Credit Hours.

The Endocrine- Reproductive module provides an integrated, comprehensive study of the normal structure and function of the endocrine and reproductive systems as well as the clinical manifestations of endocrine and reproductive disorders. Innovative, active learning methods which may include, but are not limited to laboratory, small group, and clinical case sessions allow students to develop critical thinking skills and gain a deeper understanding of the role of the endocrine system in regulation of metabolic activity, water and electrolyte balance, the endocrinology of the menstrual cycle, pregnancy, as well as human reproduction. The students benefit from a multidisciplinary approach incorporating the study of pharmacotherapeutic modalities, evidence based medicine, as well as current clinical/translational research applications into the endocrinology/reproductive medicine curriculum.

CIRC 6011. Digestive Health and Nutrition. 7 Credit Hours.

The Digestive Health and Nutrition module provides an integrated overview of the basic science and clinical concepts related to digestive health and nutrition. Through innovative learning methods that may include, but are not limited to laboratory, small group, and clinical case sessions, students gain a deeper understanding of the normal structure and function of the digestive system, as well as pathophysiology/pathology, clinical manifestations and interpretation of diagnostic tests as they relate to digestive health and nutrition. This comprehensive, multidisciplinary study includes pharmacotherapeutic approaches to treatment, interventional therapies, psychosocial aspects of digestive disease, the use of evidence-based medicine and research, epidemiology, and prevention in the field of digestive health and nutrition.

CIRC 6013. Form and Function. 7.5 Credit Hours.

The Musculoskeletal and Dermatology module provides a comprehensive study of the development, structure, and function of the musculoskeletal and integumentary systems. Students acquire a broad understanding of normal and abnormal musculoskeletal and dermatologic function through active, collaborative learning during laboratory, small group, and clinical case sessions. Diagnostic and therapeutic techniques in the management of musculoskeletal and dermatologic disorders are discussed.

CIRC 6014. Oral Maxillofacial Surgery Clinical Skills. 8 Credit Hours.

The goal of Clinical Skills module is to develop the student's bedside diagnostic skills. As a result of course lectures, readings, labs, longitudinal preceptor experience, and other Clinical Skills (CS) activities, you will be able to: (1) Perform a full history and physical and recognize specific abnormalities; (2) Record the history and physical examination in a coherent, standardized manner; (3) Construct a problem list and differential diagnosis based on the history and physical exam findings; (4) Deliver a concise organized oral presentation of the history and physical and interpretation of the findings in a standardized format. This course requires permission to register and is reserved for OMS student enrolled in the M.D. program.

Courses**CTSR 4008. Cardiothoracic Surgery. 4 Credit Hours.**

Senior students function as "sub-interns" on the cardiothoracic surgery service, taking part in all aspects of pre-operative and post-operative care in addition to observing and assisting in the operating room. They will be exposed to a wide range of pathophysiology, including cardiovascular, pulmonary and foregut disease, as well as hemodynamics and critical care. Daily responsibilities include rounding and presenting patients in the intensive care unit and inpatient ward, keeping daily records, seeing in patient consults, assisting with patient discharges and mentoring third-year medical students. Students will also evaluate patients in the outpatient clinics and emergency room. They will attend education conferences and present a case at department grand rounds. They will take call as designated by the cardiothoracic surgery services.

CTSR 4050. Congenital & Cardiac Surgery. 4 Credit Hours.

Students will attend daily rounds with the congenital heart team, including cardiologists, cardiac surgeons, pediatric internists and neonatologists. They will participate in the pre-operative evaluation and post-operative care of patients with congenital heart disease, including attendance at weekly conferences with the team. They will perform histories and physical examinations in the hospital and in the cardiology and surgery clinics. They will scrub in for congenital heart operations and cardiac catheterization procedures and present these patients to the team on daily rounds.

CTSR 7000. Off-Campus Rotation In Cardiothoracic Surgery. 4 Credit Hours.

In this course the student will work closely with the preceptor in a clinical setting that can be either in-patient or out-patient or both. The physician can work either in private practice or a residency program setting. The preceptor must be board-certified in CT surgery and have clinical faculty appointment with a LCME-Accredited Medical School. The student must not be a relative of the preceptor. Students must arrange the preceptorship directly with the attending physician.

Courses**DEHS 5001. Foundations of Ed for the Deaf. 2.5 Credit Hours.**

History of the education of the hearing impaired including Deaf Culture and American Sign Language (ASL). Impact of hearing loss on academic access, vocational choice, and personal development. Current trends in academic programming, parent-infant through college, and provisions for multicultural populations.

DEHS 5003. Speech Mech-Anatomy/Physiology/Acoustics. 2.5 Credit Hours.

This course is a study of the component parts of the speech mechanisms and their coordination to permit functional speech, physiology and acoustics of speech, impact of hearing loss on development and maintenance of functional speech skills, and individual assessment procedures. Practicum included.

DEHS 5005. Factors In Child Language Acquisition. 2.5 Credit Hours.

Course content includes the normal progression of language, cognition and social development, and how hearing loss impacts on development; an overview of acquisition of language by children who may have more than one handicapping condition; the nature of bilingual and ESL language learning in relation to hearing loss, including the impact of visual language learning through speech reading and signing systems; and the nature of language development as related to learning theories, communicative functions, and culture. Practicum included.

DEHS 5007. Introduction to Audiology. 3 Credit Hours.

Nature of sound, anatomy, and physiology of hearing; types of testing for hearing loss; analysis of audiograms; fitting of ear molds; operation and design of hearing aids; use and maintenance of FM units; and Cochlear implants and assistive technology. Practicum included.

DEHS 5011. Language Development. 3 Credit Hours.

Course content includes the assessment of present language and listening levels in hearing impaired children and methods of aural habilitation and language instruction/therapy. Practicum included.

DEHS 5021. Teaching/Management Apprenticeship 1. 4 Credit Hours.

Students spend time in the education and management/coordination of services for the hearing impaired. Students spend time teaching both hearing and hearing-impaired students and in managing and coordinating social, education, and health services for the hearing impaired. Course fees: Practicum \$10.

DEHS 5090. Independent Study. 0.5-4 Credit Hours.

This course will be arranged through DEHS faculty. Topic and mode of study are agreed upon by student and instructor. Semester hours are variable and credit hours will be determined per topic. The course is offered any term. The course may be repeated for credit when topics vary.

DEHS 6002. Counseling Families of Children with Hearing Loss. 1.5 Credit Hour.

The impact of a hearing loss upon the child, the family, and the community; reactions and adjustments identified and evaluated; delivery of services from birth through adulthood; and newborn screening are included. Crisis periods are identified and coping mechanisms evaluated. Also included are the role of classroom teacher and health professional in providing support to the family, and a multi-professional team approach to long-term management for the hearing impaired.

DEHS 6004. Curriculum Mod-Child W/Hear Loss. 2.5 Credit Hours.

Course content includes the development and adaptation of curricular materials and instructional procedures for the child with hearing impairment; selection and writing of objectives for speech, language, and listening within the content of early childhood education best practices; impact of current research in the effective teaching of reading and the language arts for children with hearing loss, including the identification of techniques and materials useful in meeting the individual needs of each student. Students will have the opportunity to learn adaptive strategies to address the needs of students with multiple handicaps. Practicum included.

DEHS 6006. Best Practices in Early Intervention. 2.5 Credit Hours.

Provision of services to infants, toddlers and preschoolers and their families through public and private agencies. Use of the Auditory-Verbal Therapy approach emphasizing the development of optimum listening skills in children with hearing impairment and the recognition of caregivers as the primary models of spoken language. Includes parent guidance, counseling, education and support. Practicum is included.

DEHS 6008. Speech for Hearing Impaired Student. 2.5 Credit Hours.

This course addresses: specific development and remedial techniques for articulation therapy; assessment of phonetic and phonologic level skills; strategies for elicitation, development; transfer and maintenance of all English phonemes and suprasegmentals; and choosing techniques appropriate to auditory/visual/tactile modalities available to the child with hearing loss. Practicum included.

DEHS 6009. Aural (Re) Habilitation. 2.5 Credit Hours.

This course is designed to study methods of pediatrics aural rehabilitation available for children with hearing loss and the impact of new technologies on therapy and teaching.

DEHS 6022. Teaching/Management Apprenticeship 2. 4 Credit Hours.

Continuation of Teaching/Management Apprenticeship I. Students will be required to develop a comprehensive portfolio of their experiences and abilities. Outcomes of their knowledge and skills gained in the program are emphasized. Course fees: Practicum \$10.

Courses**ELEC 5004. Surgical Oncology Service. 0 Credit Hours.**

Purpose and objective of this elective is to expose the student to the current and multi-modal approach in the diagnosis and management of cancer. Students will observe and monitor all activities directed to the workup, treatment, and follow-up of patients with cancer. Students will have the chance to observe and participate in the different surgical procedures, specifically those related to the treatment of cancer. He or she will be introduced to and familiarized with the principles and concepts of adjuvant chemotherapy, immunotherapy, and hormonal therapy before and after surgical treatment of different diseases. They will also have the opportunity to observe and partake in the different activities in the conduct of clinical trials as sponsored by the different national cooperative groups, i.e. the Southwest Oncology Group and the National Surgical Adjuvant Breast and Bowel Program. The students will learn the necessity for establishing different protocols in the quest for a greater understanding and improvement in the management of malignant diseases and will participate in the discussion of problems related to cancer patient care during rounds and more didactic teachings during Grand Rounds and the regular conferences of the service. Upon completion of this elective, students will have a fairly significant introduction and familiarization into clinical surgical oncology.

ELEC 5022. History Of Anatomy. 0 Credit Hours.

This course is designed to acquaint medical, dental and graduate students with the history of medicine and especially with the physicians and scientists who made essential discoveries in human anatomy. Using a biographical approach, the course is presented as a seminar with lectures, assigned readings and student presentations.

ELEC 5023. Sports Medicine Perspectives. 0 Credit Hours.

Course will expose students to the clinical practice of orthopaedic sports medicine. This includes exposure to high school, collegiate and professional sports. Emphasis will be on injury evaluation, prevention and treatment. Sports may include football, basketball, track and field, baseball, soccer, gymnastics and water sports.

ELEC 5027. Family Violence Education. 0 Credit Hours.

The course will analyze the dynamics of family violence, including the statistics, myths, types of abuse, characteristics of battered persons, the effect of violence on children, characteristics of batterers, treatment programs, the skills needed for intervention and the responsibilities of the medical profession, the legal profession and law enforcement in family violence.

ELEC 5030. Advanced Neuroanatomy. 0 Credit Hours.

This enrichment selective is intended to reinforce basic principles learned in Medical Neuroscience and to explore in greater depth current research and thought in neuroanatomy. Clinical relevance will also be stressed whenever applicable. The instructor will meet with the student(s) 2-3 hours per week for 4 weeks. A 20-page library research paper is also required. The course will be subdivided into the following components - 1) Essential Concepts - Cell Biology of Neurons & Glia, Electrochemical Basis of Neuronal Integration, Development of the Nervous System & Its Disorders; 2) Regional Neuroanatomy- Ventricles and Meninges, Cerebrovascular System, Spinal Cord, and Brainstem Anatomy; 3) Systems Neurobiology - Somatosensory System Chemosenses, Special Senses, Motor System, Extrapyramidal System, Cerebellum, Limbic System; and 4) Homeostatic Mechanisms.

ELEC 5031. Introduction To Emergency Medicine. 0 Credit Hours.

Students will be exposed to clinical emergency medicine in an extracurricular setting by working with assigned preceptors in the University Hospital Emergency Department (with the possible addition of BAMC ED or a community ED experience, including toxicology experience). Students will learn about the specialty of Emergency Medicine and its subspecialties. Students will also receive lectures on core emergency medicine topics and attend case presentations.

ELEC 5032. Interdisciplinary Issues & Approaches to Death & Dying. 0 Credit Hours.

The course provides an opportunity to explore issues and interdisciplinary approaches related to death and dying at both the personal and professional levels. Emphasis is placed on the positive and necessary values of compassion, listening and tolerance for varied beliefs. The course encourages participants to engage in constructive critical analysis through self-discovery about death and dying. Areas for discussion include: values clarification, definitions of death, stages of dying, emotions surrounding loss, survivorship, ethical and legal components of death, and transcultural aspects related to death and dying. Communication will be presented as a primary intervention method in dealing with death related issues. Critical analysis of a variety of situations will be stressed as an integral part of the interdisciplinary approach in determining appropriate therapeutic interventions.

ELEC 5036. Let Your Life Speak: Authentic Decision-Making For Your Medical School Career. 0 Credit Hours.

This course is designed to give students in their first or second year of medical school a unique opportunity to evaluate their personal decision-making process. The course will provide a forum for learning and dialoguing with other students about the various factors from a student's history and present circumstances that impact how the student makes decisions. Questions like, "How will I choose a specialty?" and "How will I maintain my passion for medicine?" will be addressed as the anatomy of the decision-making process is considered. Class will be held in a guided group discussion format with each student also receiving a one-hour personal coaching session with the instructor during the semester.

ELEC 5038. Medicine Through Literature 1. 0 Credit Hours.

The purpose of the course is for second year medical students to engage in literature that prepares them for and to process their clinical experiences and identity as people and as physicians. The course also will allow students to interact with fourth-year medical students enrolled in INTD 7007 and faculty in a venue that is open and informal. In this course we will read short stories, poems, essays, and excerpts from books of nonfiction and fiction. Many of the texts directly address medical or ethical issues, and we will promote our appreciation of these works through discussions with each other.

ELEC 5040. Trauma Enrichment Elective. 0 Credit Hours.

This course is designed to give first- and second-year medical students an introduction to the exciting field of trauma and trauma surgery. It will offer students the opportunity to observe how attendings, medical residents, medical students, and hospital staff work towards caring for patients who suffer from traumatic injury. Students may also have the opportunity to observe the surgeries if approved by the attending on duty.

ELEC 5041. Homelessness, Addiction, & How To Better Care For Patients. 0 Credit Hours.

The goals and objectives of this course are to increase awareness about homelessness and addiction and how they relate to healthcare; to prepare first- and second-year students for working at student-run clinics; and encourage student teaching within all four years of medical school. This is a student-run course, led by MS4 students in the Humanism fellowship, for MS1 and MS2 students with a special interest in learning about issues of homelessness and addiction, and how these relate to the provision of healthcare.

ELEC 5044. Enrichment Elective In Interprofessional Community Service Learning. 0 Credit Hours.

This innovative inter-professional community 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. Students will have the opportunity to examine social justice and social determinant of health issues and apply these principles in a structured service learning practicum. The student-led service learning project will address the social and health needs of a community partner and will be conducted with a 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 help foster civic responsibility in the health professions. Open for Cross Enrollment on Space Available Basis.

ELEC 5047. Global Health Enrichment Elective. 0 Credit Hours.

The course is a longitudinal enrichment elective for first- and second-year medical students who are planning to pursue global health experiences during winter, spring, or summer breaks. This elective will utilize a community-service learning module, in which preparation, mentorship, evaluation, reflection, and reporting are essential in meeting the expressed need of a particular community. The elective will provide an opportunity to learn a foundation of practical knowledge in global health and to optimize the students' overseas experiences, maximize the safety of their travel, facilitate their adaptation to working in different cultural settings, and maximize their impact in communities where they serve. Course material will be presented through a variety of approaches, including lectures, small-group case discussions, laboratory sessions, practical workshops, and online learning modules. Open for Cross Enrollment on Space Available Basis.

ELEC 5048. Enrichment Elective in Art. 0 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.

ELEC 5051. Applied Neuroanatomy. 0 Credit Hours.

This course is aimed at students and faculty who are interested in understanding applied neurosensory pathways. The purpose of the course is to reinforce the neurosensory material in the MSI Neuroanatomy course by applying the material to real world situations via interactive activities and clinical vignettes. Additionally, this course would allow students to use different types of art media to express themselves as they learn the material through different types of art media. The course content and schedule is constructed to correspond with the material and schedule of the MSI Neuroanatomy course. This elective will explore four neurosensory modalities: proprioception/balance, vision, auditory and taste/olfaction. Each modality will be covered in one two-hour class session that will be comprised of a lecture component and its corresponding laboratory component. The course will be open to 15 students.

ELEC 5054. Introduction to Culinary Nutrition. 0 Credit Hours.

Introduction to Culinary Nutrition is a medical student enrichment elective that provides the foundation for learning the principles of culinary nutrition and its role in optimizing health and wellness for the physician as a healer as well as encouraging physicians to serve as role models and educators of their patients. Intro to Culinary Nutrition is an enrichment elective, set in a state of the art kitchen theater in a downtown Culinary Academy and is taught by chefs trained in culinary nutrition and facilitated by your peers who have successfully completed the course and faculty dedicated to the practical application of nutrition in physician and patient wellness. The culinary medicine elective is a series of eight dynamic hands-on cooking experiences and will meet on various afternoons throughout each semester. Patterned after Tulane University School of Medicine's groundbreaking course, the elective aims to teach medical students about nutrition in a new way through one-on-one coaching and interactive cooking so that they can embrace a healthy lifestyle themselves while helping their patients and peers to do the same.

ELEC 5055. Issues in Women's Healthcare. 0 Credit Hours.

A comprehensive introduction to Women's Health, with an emphasis on topics that are not covered in preclinical curriculum. This course is an enriching supplement to medical school education. It will empower future doctors in any specialty to consider female patients in the context of their unique body processes, and potentially catch symptoms of various health problems early. Lectures will be given throughout the semester. Faculty and local experts in the fields under discussion will be our guest lecturers.

ELEC 5056. Integrating Public Health and Medicine in the 21st Century: Special Topics for MD/MPH Students. 0 Credit Hours.

This hybrid in-person and virtual seminar course is designed for MD/ MPH students to discuss the intersection of medicine and public health. Throughout the elective, students will explore career pathways for MD/ MPH recipients in different sectors and brainstorm regarding their own goals as physicians with public health expertise. The course will include readings, group discussion, and monthly seminars, including guest seminars from leaders in public health locally and from around the globe. Prerequisites: Students must be a part of the MD/MPH dual-degree program.

ELEC 5057. Global Health Longitudinal Elective. 0 Credit Hours.

Student demand to learn about global health and participate in global health service learning at the School of Medicine continues to grow every year. To date, the Center for Medical Humanities & Ethics has met this demand successfully. However, students who complete the Longitudinal Global Health elective (ELEC 5047) in their first year are now requesting the opportunity to continue their education in global health and engagement with global health service learning. These experienced students play an important role on subsequent trips as they serve as peer mentors and trip coordinators, improving the overall quality of the services our teams provide abroad. As a result, we are requesting the creation of a new Global Health Longitudinal Elective, specifically for second year medical students who have previously completed ELEC 5047. The Center has set a precedent for offering another elective course for students wishing to participate in the Literature in Medicine course a second time, by offering the course to both second year (ELEC 5038 - ELEC 5039) and fourth year (INTD 7004) medical students. This proposed elective will utilize a community service learning model, in which preparation, mentorship, evaluation, reflection and reporting are essential in meeting the expressed need of a particular community. The elective will also provide a foundation of practical knowledge in global health and will optimize the students' overseas experiences, maximize the safety of their travel, facilitate their adaptation to working in different cultural settings, and maximize their impact in the communities where they serve. The course material will be presented through a variety of approaches, including lectures, small group case discussions, optional laboratory sessions, practical workshops, and online learning modules. Prerequisites: ELEC 5047.

ELEC 5058. Healthcare Value Elective. 0 Credit Hours.

A comprehensive introduction to the principles of Value-Based Health Care (VBHC), with an emphasis on topics that are not typically covered in preclinical curriculum. Lectures will be given throughout the semester by School of Medicine Faculty, visiting lecturers, and community-based professionals with experience and knowledge germane to VBHC. The course material will be complemented by Dell Medical VBHC Modules.

ELEC 5059. Introduction to Research Study Design. 0 Credit Hours.

This course will provide students with an overview of basic research study design and methods. The goal of this elective is to equip students with the knowledge and skills to design a standard research protocol, thereby achieving success in their individual research endeavors. Through a combination of didactic lectures and individualized mentoring, students will learn how to conduct and interpret research literature, the basics of research ethics and regulatory considerations, and about basic study designs and data analysis. Throughout this semester long elective, students will work on a research protocol, and at the conclusion they will submit this protocol, thereby demonstrating their knowledge and application of the principles learned.

ELEC 5060. The Healer's Art. 0 Credit Hours.

The Healer's Art engages students in a community of inquiry focusing on the meaning of physicianhood and the practice of medicine. It combines seed talks in a large group setting along with small group experiential exercises. Session themes include: Discovering and Nurturing Your Wholeness, Sharing Grief and Honoring Loss, Allowing Awe in Medicine, and The Care of the Soul: Service as a Way of Life. This elective is available to first year medical students in the spring session and second year medical students in the fall session.

ELEC 5061. Basic Science Technical Training. 0 Credit Hours.

The next generation of physician leaders will interface at the frontline of clinical care and basic science research. Clinical care requires mechanistic knowledge of underlying disease progression to evaluate treatments. As a co-investigator in a basic science grant or leading a clinical care unit, physicians with advanced basic science knowledge are called to lead in the medical community. To cultivate the next generation of physician leaders, research training during medical school becomes critical for successful research opportunity achievements. The LSOM Deans Office for Research has developed an initiative to help medical students achieve a basic science foundation that will allow them to capitalize on research opportunities across campus. Through this course, medical students will learn basic science techniques and enhance technical communication and critical thinking skills that are the requisite attributes of physician leaders.

ELEC 5070. Introduction to Generative AI. 0 Credit Hours.

This longitudinal course provides a comprehensive introduction to Generative AI technologies with specific focus on applications in medicine. Through monthly 90-minute sessions combining lectures, interactive demonstrations, and hands-on exercises, students will explore the fundamental concepts and practical applications of Large Language Models (LLMs). Topics include data structures, vectorization, tokens, encoding/decoding, sentence transformers, fine-tuning techniques (PEFT/LORA), retrieval augmented generation, multimodal applications (visual/audio), and critical considerations regarding bias and legal implications. Open for Cross Enrollment on Space Available Basis.

ELEC 5080. Introduction to Python and Machine Learning. 0 Credit Hours.

This introductory enrichment course is to learn Python programming and explore its applications in Machine Learning. Machine Learning is a field of study within artificial intelligence (AI) that focuses on pattern recognition and predictive modeling, as such it has many potential applications in clinical medicine and medical research. In Machine Learning, data are given to an AI model which is used to learn patterns in the data capable of permitting predictions on non-training data. Participants will learn into Python basics, progressing to advanced topics like OOP and data manipulation. The course culminates with hands-on implementation of Machine Learning algorithms, including Random Forests and Neural Networks using NumPy. Each session features an in-class project to reinforce learning.

ELEC 5306. Medical Spanish. 0 Credit Hours.

Effective communication in health care is crucial for patients with limited English proficiency. Language-concordant care enhances patient satisfaction and reduces communication barriers. Despite a shortage of Spanish-speaking physicians, prioritizing language concordance can improve health equity and overall healthcare quality. This elective course will enhance medical students' linguistic and cultural competency to better prepare them to communicate with Spanish-speaking patients. The curriculum integrates language learning with clinical experiences to ensure students improve their Spanish skills alongside their medical education. This curriculum is open to second-year students of all levels of Spanish fluency. Permission is needed to enroll in this course along with being an MS2. A pre-test must be taken before the start of the course.

ELEC 6068. Beauty and the Brain: Neuroaesthetics and Neuroarthistory. 0 Credit Hours.

Does your brain help you appreciate the Mona Lisa? What about the Taj Mahal? This elective course explores the role of the brain in the human experience of art as well as how artists have manipulated these effects to design and orchestrate aesthetic experiences. Heavily focusing on, but not limited to, visual perception, this course investigates the way that neuroscience can be used to examine contemporary and historical human experiences of art. We begin with a critical survey of existing neuroaesthetic literature guided by the question: what assumptions about art and art viewership do researchers bring to their study of art objects and are these assumptions valid? We will then observe how collaborations between art historians and scientists have historically situated neurological phenomenon and effects of perception to examine human experience with art and the built environment. Students will then lend their own medical expertise to the examination of artistic case studies that engage the body within the sensory environment. What neural, physiological, and cognitive systems might be coming to bear on engagement with or the appreciation of a work of art and how might medical professionals begin to investigate the connection between beauty and the human brain? Open for Cross Enrollment on Space Available Basis.

Courses**EMED 3005. Emergency Medicine Clerkship. 4 Credit Hours.**

This four week core clerkship introduces the 3rd year medical students to the specialty of emergency medicine and reviews principles of emergency care that will benefit a graduate entering any specialty.

EMED 4002. Topics in Emergency Medicine. 2 Credit Hours.

This elective will allow students to create, implement, and/or complete special clinical, research and/or educational projects in the specialty of Emergency Medicine. Specific learning objectives will be written and tailored to the project by the supervising faculty member with approval by the course director prior to the start of the elective.

EMED 4005. Emergency Medicine Selective. 4 Credit Hours.

This sub-internship is designed to prepare students for the intense and responsible role of the intern. The sub-intern is an integral member of the team and will participate in all team activities and medical care for his/her patients, under the supervision of the Emergency Medicine attending. In addition to working clinical shifts, students are expected to participate in didactic sessions and perform ambulatory ride-alongs to successfully complete the course. This course is an outpatient selective. Prerequisite: EMED 3005.

EMED 4006. Toxicology and Poison Center Clinical Elective. 4 Credit Hours.

The Toxicology & Poison Center rotation is a 4-week, on-campus, pass-fail elective in the MS-4 year. This rotation is designed to develop fundamental knowledge and skills necessary to evaluate and treat patients experiencing a wide range of poisonings, envenomations, and toxicological exposures. The learner will develop skills to diagnose and manage acute and chronic poisoning in adults and children, covering the spectrum of not sick to critically ill patients. Participants will learn about the major classes of intoxication/poisoning, as well as relevant antidotes and supportive care. Environmental and occupational toxicology are also emphasized, along with terrorist toxicological weapons of destruction. The concentrated experience of lectures, case discussion rounds, webinars, simulation scenarios, hands-on toxicology lab, journal club discussion, telephone consultations, teaching by Specialists in Poison Information, and occasional patient encounters will provide an educationally rich and productive experience. Students have the opportunity to participate in a wide variety of educational experiences including toxicology case rounds, topic presentations, conferences, informal teaching sessions reviewing interesting cases with toxicology faculty, poisoning prevention, and community educational outreach activities.

EMED 4007. Wilderness and Survival Medicine. 4 Credit Hours.

Wilderness and Survival Medicine is a four-week elective designed to prepare students to practice safely in resource-limited and backcountry environments. The course consists of three weeks of face-to-face instruction and skills-training and an additional four-day wilderness practicum. All instructors are UT Health San Antonio faculty from the Departments of Emergency Medicine, Orthopedics, and Medicine. In addition to the standard wilderness medicine curriculum, students will receive specialized training in austere ultrasound, infectious disease, and survival. Upon successful completion of this course, students will be eligible for Advanced Wilderness Life Support (AWLS) certification. Prerequisites: Completion of the Emergency Medicine (3rd year) clerkship.

EMED 4008. Emergency Medicine in Global Health. 4 Credit Hours.

The elective is designed for senior medical students who will be pursuing Emergency Medicine residency, and who have interest in global health or emergency care in resource-limited environments. The entirety of the World Health Organization Basic Emergency Care (WHO BEC) curriculum for initial care of acutely ill or injured patients will be covered, and students will also complete a "training of the trainer" program so that they can be certified to co-teach the WHO BEC curriculum in the future. This will be the major component of the elective, and will strengthen senior medical students' confidence and abilities in patient resuscitation in both resource-rich and austere environments. This will also allow students to educate and develop other healthcare providers. This elective curriculum will also touch upon more advanced emergency care topics, high-yield tropical medicine, environmental and wildlife exposures, travel medicine, global health ultrasound applications, and humanitarian aid response. The curriculum consists of lectures, small group and case-based sessions, and hands-on skill sessions. Students will be evaluated based on their attendance, participation in group-based scenarios, and written examination. Prerequisites: EMED 3005. Open for Cross Enrollment on Space Available Basis.

EMED 4051. Emergency Ultrasound. 4 Credit Hours.

Senior (4th year) medical students will be instructed in the basic use of ultrasound equipment and its application in the emergency department. Topics to be covered during this elective include ultrasound equipment and knobology, basic ultrasound physics, ultrasound-guided vascular access(peripheral, central, arterial), Extended Focused Assessment with Sonography for Trauma (E-Fast), aortic ultrasound, pelvic ultrasound, biliary ultrasound, bedside echocardiography, musculoskeletal ultrasound, deep venous thrombosis evaluation, ocular ultrasound, ultrasound guided regional anesthesia, thoracic ultrasound, renal and bladder ultrasound, ultrasound-guided procedures. This training will be accomplished with a combination of didactic lectures, extensive supervised bedside ultrasound training on emergency department patients, independent student ultrasound scanning sessions, required textbook reading, weekly video review sessions and weekly literature review. Each student will be required to complete a minimum of 100 complete ultrasound examinations covering the scope of the course material. This elective is designed to provide a base knowledge in emergency ultrasound for students interested in pursuing an emergency medicine residency.

EMED 4060. Disaster Medicine, Climate Change, Emergency Preparedness. 4 Credit Hours.

This intensive course is designed to equip medical professionals with the knowledge and skills necessary to effectively respond to a wide range of disasters and emergencies, both natural and non-natural. Participants will engage with a multidisciplinary approach covering disaster medicine, incident command systems, emergency preparedness, and global health considerations. This course is only open to 4th year or late 3rd year medical students who have complete their core clerkships. Prerequisites include completion of all core clerkships. Open for Cross Enrollment on Space Available Basis.

EMED 4076. Emergency Medicine Rotation - Brooke Army Medical Center. 4 Credit Hours.

BAMC is a Level 1 Trauma Center seeking approximately 50,000 patients per year. All patient types are seen: trauma victims, complicated medical patients, children, OB/GYN patients and psychiatric patients. There is no "compartmentalization" of the Emergency Department. Students work on average of 5 eight-hour shifts per week with a mixture of days, evenings, nights and weekends. Students work one-on-one with staff physicians or senior emergency medicine residents. There are five hours of Grand Rounds per week. There is Morning Report every Monday, Tuesday, Wednesday and Thursday. Each student has the opportunity to participate in a procedure lab, DPL, chest tubes, thoracotomy, transvenous pacing and cricothyroidotomy. This rotation must be arranged through Vanessa Soto, even if you are a HPSP student. No late Drops will be accepted.

EMED 7000. Off Campus Rotation In Emergency Medicine. 4 Credit Hours.

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

Courses

INTD 1091. Independent Study. 4 Credit Hours.

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

INTD 3001. International Elective. 0 Credit Hours.

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

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

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

INTD 3030. Clinical Foundations. 3 Credit Hours.

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

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

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

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

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

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

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

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

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

INTD 3091. Independent Study. 9 Credit Hours.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

INTD 4019. Clinical Ethics. 2 Credit Hours.

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

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

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

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

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

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

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

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

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

INTD 4048. Art Rounds. 2 Credit Hours.

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

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

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

INTD 4103. Communication Skills. 0.5 Credit Hours.

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

INTD 4104. Improving Patient Outcomes. 0.5 Credit Hours.

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

INTD 4105. Medical Jurisprudence. 0.5 Credit Hours.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

INTD 4300. Advanced Generative AI. 4 Credit Hours.

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

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

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

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

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

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

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

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

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

INTD 5023. Research Ethics. 1 Credit Hour.

The goal of this course is to provide the Master's student an opportunity to gain the essential standards necessary for training and education approved by the National Institute of Health. This course links to the web-based NIH Clinical Research Training On-Line Course <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 Education Experience - LINC. 0 Credit Hours.

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

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

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

INTD 5035. UTeach. 2 Credit Hours.

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

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

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

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

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

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

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

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

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

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

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

INTD 5047. Neuroanatomy. 2 Credit Hours.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

INTD 6002. Ethics In Research. 0.5 Credit Hours.

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

INTD 6007. Advanced Cell Biology. 2 Credit Hours.

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

INTD 6008. Mitochondria & Apoptosis. 1 Credit Hour.

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

INTD 6009. Advanced Molecular Biology. 2 Credit Hours.

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

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

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

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

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

INTD 6019. Pharmacotherapeutics. 1 Credit Hour.

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

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

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

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

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

INTD 6038. Biomedical Fundamentals. 3 Credit Hours.

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

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

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

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

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

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

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

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

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

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

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

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

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

INTD 6075. Practical Machine Learning. 2 Credit Hours.

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

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

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

INTD 6085. Advanced Machine Learning. 2 Credit Hours.

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

INTD 6097. Research. 0.5-12 Credit Hours.

This course is intended for first-year 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 7009. HIV Out Loud: Building the History of an Epidemic. 2 Credit Hours.

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

INTD 7020. Clinical Patient Management. 4 Credit Hours.

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

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

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

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

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

INTD 7050. Gross Anatomy. 6 Credit Hours.

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

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

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

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

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

Courses**PSYC 3005. Psychiatry Clerkship. 6 Credit Hours.**

The psychiatric clinical clerkship is designed to familiarize the student with the personality traits, illnesses, and emotional disturbances that affect health and productivity. It is an opportunity for the student to develop and strengthen clinical skills in interviewing patients, formulating treatment plans, and carrying out treatment with patients who have psychiatric illness. The clerkship is arranged so the student may select the assignment area on the basis of particular interest, i.e., an inpatient/outpatient setting. The student's role in the clerkship is arranged to allow for considerable experience in the working relationship between patient and "physician" in the treatment process. Seminars have been developed to allow the student an in-depth appreciation of the various psychiatric states and emotional problems that affect the general practice of medicine. The student-staff ratio allows for small groups of students to meet with faculty, thereby enhancing learning. The clerkship is an opportunity for the students to look at their personal feelings and values and understand how they influence patient care, to learn how to deal with psychiatric disease, and to become more comfortable in dealing with the personalities of patients with organic disease. Prerequisites: Successful completion of all required preclinical courses is prerequisite to enrollment in any of the clinical clerkships.

PSYC 4000. Special Topic. 4 Credit Hours.

This is a self-designed course created by both the student and the department to cover a specific topic. A Course Approval Form must be completed along with documentation of the designed course description.

PSYC 4001. Clinical Psychiatry. 4 Credit Hours.

The fourth-year medical student inpatient rotation is designed as a bridge between the role of third-year clerk and the very active, responsible role of the intern. The fourth-year medical student will act as the primary psychiatrist under the supervision of a full-time attending. The student will be an integral member of the team, and will participate in all team activities. All activities for this experience will be on an inpatient psychiatric service at the University Hospital, Veterans' Administration Hospital, in San Antonio. These are busy units with brief lengths of stay. The student will have the opportunity to gain considerable experience with crisis management of serious mental illness as well as an understanding of acute exacerbations of chronic mental illness.

PSYC 4015. Geriatric Psychiatry. 4 Credit Hours.

This course teaches student how to manage the developmental, psychological, and neurodegenerative changes associated with aging. Students rotate through academic geriatric psychiatry clinics that treat elders with mood, anxiety, thought, and cognitive disorders. Students rotate through VA memory clinics where they learn how to administer, score, and interpret psychometric assessments and how to treat and prevent cognitive decline. Prerequisites: Psychiatry Clerkship.

PSYC 4020. Consultation-Liaison Psychiatry. 4 Credit Hours.

The course includes participation in the evaluation and management of medical and surgical inpatients with psychiatric conditions at the University Hospital or the VA. Students commonly treat patients diagnosed with delirium, depression following severe suicide attempts, illness anxiety disorder, and abuse. Student learn the interface between medicine and psychiatry and how to assess decisional capacity. Prerequisites: Psychiatry Clerkship.

PSYC 4023. Child & Adolescent Psychiatry. 4 Credit Hours.

To gain clinical experience in outpatient child/adolescent psychiatry, students will attend the Clarity Child Guidance Center outpatient psychiatry clinics. Students will also be assigned to various selected sites including the Bexar County Juvenile Detention Center, the Cyndi Taylor Krier Secure Juvenile residential treatment center, the Roy Maas Youth Alternatives outpatient clinic, Trauma Clinic and Child Consultation/Liaison service. During the rotation, students will attend seminars and journal club with the child and adolescent psychiatry residents.

PSYC 4024. Telepsychiatry. 4 Credit Hours.

The rotation introduces the medical student to some of the technical, legal, and patient care issues arising from the use of telehealth technologies. Telehealth is defined as providing services remotely through technology including phone contact and videoconferencing. This technology is being used increasingly to provide needed psychiatric services for underserved rural areas. Studies have demonstrated non-inferiority of services provided through telehealth services. Medical students will participate in a 1:1 supervised experience with a faculty member providing telepsychiatry for mental health evaluation and treatment using a Tandberg unit from the remote site in San Antonio to an originating clinical site in VA Texas Valley Coastal Bend Healthcare System (VATVCBHCS). There are no in-person patient contacts during this rotation as all services are provided through videoconferencing to the originating VA clinics. This educational experience will be provided under the supervision of the telehealth psychiatrist located on site in San Antonio with the medical student. Notes and orders will be documented through the VA's Computerized Patient Record System (CPRS). Patients will be asked to complete clinical rating scales at the time of the appointment and a satisfaction survey following each clinical encounter, which are tracked for quality improvement purposes. The rotation will include 1/2 hour weekly didactic sessions for the students. Material will include information on clinical skills such as interviewing, mental status exam, and diagnostics as they are performed using the videoconferencing equipment.

PSYC 4025. Introduction to Psychotherapy: Principles and Practice. 4 Credit Hours.

In the Introduction to Psychotherapy Principles and Practice elective, fourth year medical students will learn how to apply the fundamentals of psychotherapy, including empathy, identifying affect, transference phenomena, therapeutic alliance, patient motivation, and boundaries with guidance from an established psychodynamic therapy clinical manual [1]. Students will have opportunities to practice basic psychotherapy skills with patients in a variety of clinical settings, including UT Health outpatient psychiatry clinics and University Hospital inpatient and consult-liaison psychiatry services. Students will be assigned readings and videos on core psychotherapeutic modalities, including Supportive Psychotherapy, Dialectical-Behavioral Therapy, Cognitive Processing Therapy, and Motivational Interviewing. Interactive weekly meetings will be held to review assigned readings and process patient encounters. Students will be evaluated on participation in scheduled activities and development of basic clinical psychotherapy skills. References: [1] Cabaniss, D., Cherry, S., Douglas, C., and Schwartz, A (2017). Psychodynamic Psychotherapy: A Clinical Manual (2nd ed.). John Wiley & Sons Inc. Prerequisites: PSYC 3005.

PSYC 4040. Interventional Psychiatry. 4 Credit Hours.

During the Interventional Psychiatry Elective, third and fourth-year medical students who have completed their Psychiatry Clerkship rotation will learn about the subspecialty of psychiatry that utilizes procedures to address psychiatric conditions. Examples include electroconvulsive therapy (ECT), repetitive transcranial magnetic stimulation (rTMS), and intranasal esketamine (Spravato). Students will participate in screening patients for these outpatient interventions, monitoring them during interventional procedures, and performing pre-/post-interventional assessments. They will learn about the neurobiological theories and research supporting the use of each intervention, as well as the limitations of each procedure. Students are evaluated using the Clinical Elective Rotation Performance Assessment of Student tool. A pass is awarded if the student's overall performance meets or exceeds expectations. Prerequisites: Psychiatry Clerkship.

PSYC 4044. Sleep Medicine Psychiatry. 4 Credit Hours.

Learning Objectives: Obtain sleep history in compassionate, caring and emphatic manner. Perform focused clinical examination with skilled bedside manners and respect for patient's privacy and dignity. Demonstrate basic understanding of common sleep disorders and their impact on health and well-being. Understanding of basic sleep physiology and neurotransmitters involved in sleep and wake regulation. Understanding of pharmacology of commonly used sleep and wake promoting medications. Basics of polysomnographic testing. Understanding of different sleep stages and EEG features. Describe and discuss Spielman's 3P model of insomnia. Brief Description: Sleep medicine is a relatively new medical discipline that has grown tremendously and has become an independent discipline over the last 30 years. Sleep is a fundamental part of our lives, and about one-third of our life is spent sleeping. It is a multidisciplinary field with overlap with psychiatry, neurology, ENT and pulmonology. Asking about sleep is an integral part of a psychiatric consultation. Almost all of the psychotropic medications have an effect on sleep architecture. Understanding sleep can help enhance comprehension and understanding of psychiatric illness. Many psychiatric patients have comorbid sleep disorders and vice versa. There is a need for sleep medicine trained physicians; in recent years an increasing number of residents are pursuing further training in sleep medicine. The sleep medicine elective at the University of Texas School of Medicine is a flexibly structured clinical experience for clinical students. The course consists of various experiences in the (1) sleep medicine outpatient clinic (2) in a 4 bed sleep laboratory at the VA medical center and (3) at the University Hospital affiliated sleep lab and clinic. Students will receive an introduction to common sleep disorders including insomnia, parasomnia, sleep related breathing disorders, hypersomnias and sleep related movement disorders. There will be an opportunity to learn how to obtain a sleep history and perform a focused sleep related examination. Students will observe board certified physicians every other week interpret polysomnograms, multiple sleep latency tests and actigraphy. This four-week elective is tailor made to fit the interest, learning needs and aspirations of the student. At times, opportunities will be available to spend time with a sleep psychologist learning basics of Cognitive Behavioral Therapy for insomnia and dental sleep exposure. Prerequisites: Successful completion of the internal medicine, psychiatry and neurology clerkships.

PSYC 4045. Community Psychiatry and Substance Use Disorder MS4 Clinical Elective. 4 Credit Hours.

Learning objectives: Substance use disorder is a common psychiatric condition encountered with high frequency in psychiatric and other medical practice areas. However, physicians and other health professionals often receive little training in how to manage substance use disorder in routine clinical practice. In this 4-week elective experience, the student will 1) Assist in evaluation of typical community psychiatry outpatients, learn to effectively screen for substance use problems and learn to manage this psychiatric co-occurring condition in the outpatient setting. 2) Assist in formal substance use disorder evaluation and treatment in the Be Well substance use disorder treatment clinic including group psychotherapies and medication management of opioid, alcohol, and other substance use disorders. 3) Read and discuss 3-4 journal articles on substance use disorder topics over the 4-week period. 4) Receive and read other directed readings from the course directors relevant to patients treated in the clinics. Conditions: Medical students must complete the Psychiatry MS3 rotation prior to this elective. No visiting students may be enrolled. Most medical students will have very limited or no exposure to a comprehensive outpatient substance use disorder treatment clinic in their standard psychiatry rotation. This elective fills an important gap in training exposure that can benefit not only students applying to psychiatric residencies but also those applying to general medicine or other medical specialty residencies. Location: University Plaza Bldg., 7526 Louis Pasteur, 3rd floor. Types of instructional methods: Clinical demonstration and observation with attending physicians, residents, psychotherapists; 1:1 discussion with course director/ co-director during weekly 1-hour meetings. Average number of contact hours per week: 20 hours When offered and number of students: 1-2 students (per period) by mutual agreement and approval with the course director for all periods throughout academic year(course director reserves right to exclude occasional periods based on vacation times, etc.) Assessment: Direct feedback to student and completion of the standard on-line medical student evaluation instrument. Additional information: this course is an elective, it involves interprofessional interactions, there is no travel requirements, and no enrollment of visiting students. No Memorandum of Understanding is needed with the clinic (already exists) and no medical equipment. Prerequisites: Medical students must complete the Psychiatry MS3 rotation prior to this elective; No visiting students may be enrolled.

PSYC 7000. Off Campus. 4 Credit Hours.

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

Courses

MEDI 3105. Medicine Clerkship. 8 Credit Hours.

The objectives of this clinical experience are to provide opportunities for students to develop patient evaluation skills, productive self-learning techniques, a sound pathophysiological approach to medical disease, a concern and awareness for the patient's needs, and personal professional behavior. The student spends eight weeks, divided into two 4-week blocks, assigned to the inpatient General Medicine Service. An additional four weeks are spent in outpatient services. Bedside clinical teaching is emphasized by asking the student to perform patient evaluations, to contribute to the care of selected patients, and to participate in the clinical rounds of the services. During this clerkship the student receives intensive instruction from the Internal Medicine house staff and faculty. In addition, the student is expected to undertake independent patient-oriented reading and to systematically review pertinent information introduced during the preclinical years. Finally, students attend a series of clinical conferences including medical grand rounds, morbidity and mortality conferences, clinical subspecialty conferences, and organized courses in electrocardiography and nutrition. Successful completion of all required preclinical courses is prerequisite to enrollment in any of the clinical clerkships. The student spends eight weeks, divided into two 4-week blocks, assigned to the inpatient General Medicine Service. An additional four weeks are spent in outpatient services. Bedside clinical teaching is emphasized by asking the student to perform patient evaluations, to contribute to the care of selected patients, and to participate in the clinical rounds of the services. During this clerkship the student receives intensive instruction from the Internal Medicine house staff and faculty. In addition, the student is expected to undertake independent patient-oriented reading and to systematically review pertinent information introduced during the preclinical years. Finally, students attend a series of clinical conferences including medical grand rounds, morbidity and mortality conferences, clinical subspecialty conferences, and organized courses in electrocardiography and nutrition.

MEDI 4000. Special Topic. 4 Credit Hours.

This is a self-designed course created by both the student and the department to cover a specific topic. A Course Approval Form must be completed along with documentation of the designed course description.

MEDI 4002. Clinical Cardiology. 4 Credit Hours.

Students are required to participate in inpatient consultations and outpatient clinics evaluating patients with cardiovascular disease. Students are required to perform inpatient consultations at University Hospital and Audie L. Murphy V. A. Hospital. Students are required to perform appropriately focused history and physical exam, prepare written and verbal presentations, interpret laboratory data, and develop differential diagnosis and management plan on each assigned patient. Students are required to also have learning opportunities in ECG interpretation, the cardiac catheterization laboratory, and non-invasive test interpretation such as exercise treadmill testing and echocardiograms. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4006. Coronary Care Unit - Subinternship - VA. 4 Credit Hours.

This subinternship is designed to prepare students for the intense and responsible role of the intern. The subintern is an integral member of the team and is required to participate in all team activities and participate in all medical care for his/her patients, under the supervision of the Internal Medicine resident, Cardiology fellow, and Cardiology attending. Students are required to care for patients in the CCU and Telemetry ward. The student will be involved in the inpatient care of patients with cardiac disease, including critically ill patients needing hemodynamic and respiratory monitoring and ventilation support. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4007. Cardiology Care Unit Sub-Internship-SAMMC. 4 Credit Hours.

This subinternship is designed to prepare students for the intense and responsible role of the intern. The subintern is an integral member of the team and is required to participate in all team activities and participate in all medical care for his/her patients, under the supervision of the Internal Medicine resident, Cardiology fellow, and Cardiology attending. Students are required to care for patients in the CCU and Telemetry ward. The student's clinical performance will be evaluated by the supervising attending. Students are required to participate in the care of patients with a wide spectrum of acute and chronic cardiovascular problems. Emphasis is placed on mastering basic physical assessment through history and detailed cardiovascular physical examination and the interpretation of non-invasive and invasive cardiac testing. Students will have exposure to the catheterization laboratory, M-mode, 2-D, and Doppler echocardiography, color flow imaging, exercise testing, and 24-hour dynamic ECG rhythm monitoring and analysis. No late drops will be accepted. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4008. Clinical Endocrinology. 4 Credit Hours.

Students are required to participate in inpatient consultations and outpatient clinics evaluating patients with pituitary and hypothalamic disease, adrenal disease, diabetes mellitus, thyroid disorders, and lipid disorders. Students are required to perform inpatient consultations at Audie Murphy VA Hospital and University Hospital. Outpatients will be evaluated in weekly endocrine clinics at the VA Hospital and Texas Diabetes Institute. Students will be responsible for the initial evaluation of assigned patients, presentation of findings from the history and physical exam, interpretation of endocrine testing, and formation of differential diagnosis. If rotation is done as the Ambulatory selective, the student is required to prepare a written essay based upon specific course objectives concerning systems of care. Essays must be submitted on the last day of the rotation and are required to receive a passing grade in the course. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4010. Clinical Dermatology. 4 Credit Hours.

This elective is recommended for students with a serious interest in Dermatology, and for those intent upon further training in Internal Medicine, Family Medicine, and Pediatrics. It offers considerable clinical experience in both outpatient clinics and supervised inpatient consultations. Students rotating at UTHSCSA are required to attend teaching conferences every Wednesday (all day) and Friday afternoons. This didactic time for students and residents includes lectures, journal reviews, text reviews, and clinical Kodachrome sessions. Didactic sessions will be held separately at WHMC and BAMC. Each student is required to do a 10-minute PowerPoint presentation on a topic of choice that is both dermatology related and fits in with choice of residency. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4012. Clinical Endocrinology - WHMC. 4 Credit Hours.

Students will have exposure to a very active clinical endocrinology consultation service, outpatient endocrine clinic, and the performance and interpretation of diagnostic procedures in endocrinology. Students must perform appropriately focused history and physical exams, prepare written and verbal presentations, interpret laboratory data, and develop differential diagnosis and management plan on all assigned patients. Clinical performance will be evaluated by supervising attending. No late drops will be accepted. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4015. Clinical Gastroenterology. 4 Credit Hours.

Students are required to participate in inpatient consultations at Audie L. Murphy V. A. Hospital (ALMVAH) and University Hospital, outpatient clinics at ALMVAH and University Health System, and special gastrointestinal diagnostic testing under the supervision of Internal Medicine residents, GI fellows, and GI Faculty. Students are required to participate in the independent evaluation of patients with disorders of the gastrointestinal tract, pancreas, and liver. Students are required to become familiar with the application, indications, contraindications, and complications of gastroenterological procedures, as well as the proper preparation of the patient for the procedure. Students are required to perform appropriately focused history and physical exams, prepare written and verbal presentations, interpret laboratory data, and develop differential diagnosis and management plans on all assigned patients. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4017. Gastroenterology - SAMMC. 4 Credit Hours.

Students will be exposed to clinical gastroenterology with didactic instruction, and will work in conjunction with house staff as part of the primary care team. Students are required to perform appropriately focused history and physical exams, prepare written and verbal presentations, interpret laboratory data, and develop differential diagnosis and management plan on all assigned patients. Students will have exposure to the full range of special diagnostic procedures including observation of upper endoscopy, endoscopic ultrasound, colonoscopy, flexible sigmoidoscopy, endoscopic retrograde cholangiopancreatography (ERCP), percutaneous liver biopsy, laparoscopy, and related techniques. No late drops will be accepted. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4018. Clinical Hematology. 4 Credit Hours.

The consultation service includes clinical exposure to inpatient consultations, conferences, and outpatient clinics. There is opportunity for training in blood and marrow morphology, observation, and performance of special clinical and laboratory procedures. Students are responsible for the following on all assigned patients: history and physical examination, admission/progress notes, doctor's orders, interpretation of laboratory data, formation of differential diagnosis, assessment, and management plan. Students on both services are required to attend conferences including Hematology Clinical Conference, Hematology/Pathology Conference, Bone Marrow Transplant Conference, and Coagulation Conference. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4023. Clinical Infectious Disease. 4 Credit Hours.

Infectious diseases cross all subspecialty lines, especially because antibiotics and antifungal and antiviral agents are employed widely throughout medical practice. This elective will provide practical experience in the diagnosis and management of patients with infectious diseases. There will be particular emphasis upon the pharmacology and pharmacodynamics of antimicrobial agents, selection of appropriate diagnostic tests and therapeutic agents, and the appropriate orientation of the clinician to hospital microbiology laboratories. Students are required to participate in outpatient clinics and inpatient consultations at University Hospital and Audie L. Murphy V. A. Hospital and the associated clinics. Students will be responsible for the following in all assigned patients: history and physical examination, written and verbal patient presentations, interpretation of laboratory testing, participation in applicable procedures, development of differential diagnosis, assessment, and management plans. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4024. Infectious Disease - SAMMC. 4 Credit Hours.

The course will provide students the opportunity to obtain a broad experience in the management of infectious diseases. The spectrum of illness ranges from HIV infection to chronic osteomyelitis. Students are required to care for patients with primary infectious disease problems, or patients with major illnesses in whom an infectious complication has arisen, under the direction of the consultation resident, with supervision from the fellow and staff on the Infectious Disease Service. Students are required to perform appropriately focused history and physical exams, prepare written and verbal presentations, interpret laboratory data, and develop differential diagnosis and management plans on all assigned patients. Basic bacteriological techniques and specific techniques of bacteriological identification and sensitivity testing are reviewed. No late drops will be accepted. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4025. Clinical Nephrology. 4 Credit Hours.

Students are required to participate in the consultation service, outpatient clinics, conferences, acute dialysis unit, and renal biopsy program. A variety of acid-base fluid and electrolyte disorders are seen in addition to the entire spectrum of renal diseases. Student exposure to chronic dialysis and renal transplantation programs is also possible. Students perform appropriately focused history and physical exam, prepare written and verbal presentations, interpret laboratory data, and develop differential diagnosis and management plans on all assigned patients. If rotation is done as the Ambulatory Selective, the student is required to prepare a written essay based upon specific course objectives concerning systems of care. Essays must be submitted on the last day of the rotation and are required to receive a passing grade in the course. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4026. Nephrology Service - SAMMC. 4 Credit Hours.

The Nephrology Service offers students training and experience in the broad field of clinical nephrology. This consult rotation provides exposure to ambulatory and hospitalized patients with a variety of renal diseases including hypertension, glomerulonephritis, acute and chronic renal failure; exposure to problems of fluid, electrolyte, and acid-base disturbance. While on the service, students will be able to observe acute and chronic hemodialysis. Students are required to perform initial evaluations, including history and physicals, and will, under appropriate supervision, perform selected diagnostic procedures. A didactic lecture series, covering the broader topics of nephrology, is repeated on a monthly basis and the students are expected to attend. No late drops will be accepted. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4034. Oncology Consultation Service. 4 Credit Hours.

The students are required to participate in the clinical activities of the Medical Oncology Section of the Division of Hematology/Oncology, with experience on the consultation service at both University Hospital and the VA Hospital, plus intensive outpatient experience in the Oncology Clinics. The inpatient consultation experience provides exposure to management of complex oncology problems. The clinic experience provides exposure to a variety of clinical medical oncology problems and their management in the outpatient setting. The student is required to become familiar with all aspects of supportive care for the oncology patient. Students are required to perform appropriately focused history and physical exams, prepare written and verbal presentations, interpret laboratory data, and develop differential diagnosis and management plans on all assigned patients. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4042. Coronary Intensive Care Unit - Subinternship - UH. 4 Credit Hours.

The objective of this subinternship is to prepare students for the intense and responsible role of the intern. The subintern is an integral member of the team and are required to participate in all team activities and participate in all medical care for his/her patients, under the supervision of the Internal Medicine resident, Cardiology fellow, and Cardiology attending. The student is required to become proficient in the work-up, diagnosis, and management of patients with acute myocardial infarction, acute respiratory failure, and other commonly encountered acute crises; develop expertise at arrhythmia recognition/ therapy, principles involved with airways management/mechanical ventilation. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4043. Clinical Chest Disease Consultation Service. 4 Credit Hours.

Students are required to work in the inpatient and outpatient settings, participating in clinics, inpatient consultations, and division conferences. Students are required to perform appropriately focused history and physical exams, prepare written and verbal presentations, interpret laboratory data, and develop differential diagnosis and management plans on all assigned patients. Students are required to actively participate in the work-up and management of patients with acute and chronic lung diseases seen by the Consultation Service and attend Pulmonary clinics at the VA Hospital and UHC-D. Students will be exposed to various diagnostic methods including radiographic, radionucleotide, bronchoscopy, and pleural biopsy techniques. Through active participation, the student should become proficient in interpreting commonly used pulmonary function tests and chest x-rays. Principles and methods involving respiratory therapy, antimicrobial therapy, and evaluation of common pulmonary disorders will be emphasized. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4045. Pulmonary Medicine- SAMMC. 4 Credit Hours.

Students are required to learn the recognition and treatment of acute and chronic pulmonary problems on a consult service with selection and implementation of appropriate treatment modalities. Students also are required to become familiar with pulmonary function testing to include interpretation and application of pulmonary physiology to a clinical setting. Principles of respiratory therapy will be emphasized to include the utilization of respirators and oxygen delivery systems. Clinical projects may be assigned to stress key teaching points. An active pulmonary clinic and complete pulmonary function laboratory will be available for students to gain clinical experience. No late drops will be accepted. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4046. General Medicine Ward Subinternship-UH/VA. 4 Credit Hours.

The goal of this subinternship is to prepare students for the intense and responsible role of the intern. The subintern is an integral member of the team and is required to participate in all team activities and participate in all medical care for his/her patients, under the supervision of the Internal Medicine resident and attending. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4047. General Medicine Ward Subinternship-SAMMC. 4 Credit Hours.

This subinternship is designed to prepare students for the intense and responsible role of the intern. The subintern is an integral member of the team and is required to participate in all team activities and participate in all medical care for her/his patients, under the supervision of the Internal Medicine resident and attending. No late drops are accepted. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4048. Medical ICU Subinternship - SAMMC. 4 Credit Hours.

The goal of this subinternship is to prepare students for the intense and responsible role of the intern. The subintern is an integral member of the team and is required to participate in all team activities and participate in all medical care for his/her patients, under the supervision of the Internal Medicine resident, Critical care fellow and attending. Familiarization with pulmonary and hemodynamic physiology, as it applies to intensive care medicine, as well as the use and interpretation of data obtained from monitoring instruments, will be covered. No late drops will be accepted. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4049. Clinical Rheumatology. 4 Credit Hours.

The differential diagnosis and treatment of rheumatic and autoimmune diseases are taught through active student participation in outpatient clinics, consultation rounds, journal clubs, and division conferences. Students are required to evaluate patients at University Hospital, Audie Murphy VA Hospital, and UHC-D. Students are required to perform appropriately focused history and physical exams, prepare written and verbal presentations, interpret laboratory data, and develop differential diagnosis and management plans on all assigned patients. Students will also have exposure to community resources for the special problems encountered by the patients in this clinic and be able to identify different types of medical delivery systems. If rotation is done as the Ambulatory Selective, the student is required to prepare a written essay based upon specific course objectives concerning systems of care. Essays must be submitted on the last day of the rotation and are required to receive a passing grade in the course. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4058. Clinical Pharmacology. 4 Credit Hours.

This selective is an essential course in Drug Prescribing and Therapeutics for future interns in any specialty. It is an excellent opportunity to brush up on drug therapy before entering residency and to avoid causing harm to the patients through mis-prescription of drugs. The drugs of the major therapeutic areas and how they are used are reviewed by specialists from the Departments of Medicine, Psychiatry, Surgery, Pharmacology, and Clinical Pharmacy. Particular emphasis is placed on the use of drugs in clinical scenarios and on developing therapeutic regimens.

MEDI 4062. Allergy-Immunology - WHMC. 4 Credit Hours.

The student will be a member of the Allergy-Immunology Ward Consult Team, along with a staff member, first-year fellow, and usually a resident. Students are required to assist in the evaluation of the inpatient consultations, and in addition see outpatients and attend all Allergy-Immunology Service educational activities. Students are required to perform appropriately focused history and physical exam, prepare written and verbal presentations, interpret laboratory data, and develop differential diagnosis and management plan on all assigned patients. No late drops will be accepted. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4066. Medical ICU Subinternship - UH/VA. 4 Credit Hours.

This subinternship is designed to prepare students for the intense and responsible role of the intern. The subintern is an integral member of the team and is required to participate in all team activities and participate in all medical care for his/her patients, under the supervision of the Internal Medicine resident, Pulmonary fellow, and Pulmonary/Critical care attending. Students are expected to participate in daily hospital rounds, morning report, Grand Rounds, Morbidity and Mortality conference, IM Housestaff conferences. The students are required to actively participate in the work-up and management of patients with critical illnesses under close supervision of the housestaff, fellows, and faculty. During this rotation, the student will be exposed to the fundamentals of ventilation support, airway management, respiratory and hemodynamic monitoring, stabilization and support of the critically ill patient. Emphasis is placed upon a system approach to patient evaluation and will include didactic sessions with critical care faculty in addition to daily rounds. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4068. Geriatric Medicine. 4 Credit Hours.

This rotation offers clinical experience in geriatric internal medicine. The student is required to participate in the Section's outpatient clinic, academic nursing home, and didactic educational activities. The student also has the opportunity for exposure to other multidisciplinary programs in geriatric medicine, including hospital-based home care. Students are required to perform appropriately focused history and physical exams, prepare written and verbal presentations, interpret laboratory data, and develop differential diagnosis and management plans on all assigned patients. Students will also have exposure to community resources for the special problems encountered by geriatric patients and have the opportunity to learn to be able to identify different types of medical delivery systems. If the rotation is done as the Ambulatory selective, the student will be required to prepare a written essay based upon specific course objectives concerning systems of care. Essays must be submitted on the last day of the rotation and are required to receive a passing grade in the course. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4074. AHEC Clinic Experience. 4 Credit Hours.

Under the auspices of the UT Health Science Center's South Texas Program, this experience exposes students to primary care of ambulatory patients at various clinical training sites in South, East, West, and the Coastal area of Texas. The goals are to expose you to 1) primary care, 2) community-based practice, and 3) delivery of medical care to underserved/rural populations and health disparities. Please reference the link <http://southtexas.uthscsa.edu> for more information. The student must spend time working in the office practice of a physician who is board certified in Internal Medicine and/or one of its specialties. In addition, the student can gain experience in preventive services applicable to infectious diseases, tuberculosis, diabetes, etc., and work with health professionals to gain a broader understanding of health care needs and services depending upon the area in which he/she is working. The student will be required to prepare a written essay based upon specific course objectives concerning systems of care. Essays must be submitted on the last day of the rotation and are required to receive a passing grade in the course. Student housing expenses may be covered by the AHEC, but there will be no reimbursement for travel costs. No late drops will be accepted. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4077. EKG Interpretation. 2 Credit Hours.

This rotation is designed for students who have basic to intermediate expertise in reading ECG's and who are motivated to enhance this expertise through independent study. Students have the opportunity to become proficient in the interpretation of ECG's through daily self-study of electrocardiograms. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4078. HIV/AIDS Inpatient Service. 4 Credit Hours.

This elective on the HIV/AIDS Medicine Team 6 at University Hospital offers the opportunity to assume direct patient responsibility under the supervision of a resident, Infectious Disease fellow, and attending faculty. This subinternship is for persons interested in obtaining extensive teaching in HIV disease. It provides practical experience in the diagnosis and treatment of HIV complications such as PCP, CMV, toxoplasmosis, invasive fungal infections, mycobacterial disease, and oncological and neurological complications of this disease. These objectives will be obtained through a team approach to patients with HIV infection involving nurses, physicians, and other staff, and also will include a formal didactic teaching series. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4079. Clinical Preceptorship in General Internal Medicine. 4 Credit Hours.

The student will join the practice of a clinical faculty member practicing general internal medicine in an internal medicine subspecialty in the local community. Activities include hospital rounds, office visits, hospital committee meetings, and an introduction to practice management. Students are required to perform appropriately focused history and physical exams, prepare written and verbal presentations, interpret laboratory data, and develop differential diagnosis and management plans on all assigned patients. Students will also have exposure to community resources for the special problems encountered by patients in the ambulatory setting, and be able to identify different types of medical delivery systems. If rotation is done as the Ambulatory Selective, the student will be required to prepare a written essay based upon specific course objectives concerning systems of care. Essays must be submitted on the last day of the rotation and are required to receive a passing grade in the course. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4086. Mindfulness in Medicine. 0.5 Credit Hours.

Mindfulness is important in one's personal life as well as professional work. It supports the physician in successfully caring for patients, connecting to colleagues and patients, and maintaining personal satisfaction. There is some evidence that mindfulness training in the professional development of physicians helps with effective decision making and reducing medical errors, increases sensitivity to feelings, improves attention and memory, decreases stress, and enhances reflective consideration in problem solving and decision making. Senior students are facing the formative transition to residency training, which is laden with new challenges and stressors such as work demands that conflict with emotional and physical availability for family and friends, an immense amount of new knowledge and skill to acquire, increased work hours in a complex health care system, and coping with death and the potential for errors in patient care. New interns are fearful of making mistakes that harm a patient and worry about their work-life balance. The goal of this course is to provide and apply skills in mindfulness for everyday practice so that learners are armed with the knowledge and techniques to improve their attention, renew their perspective during times of stress, build resiliency, and prevent errors and harm in their professional practice. Learning Objectives: By the end of this course, students should be able to: 1. Identify personal characteristics of leadership, bias, and resiliency and use this self-awareness to enhance professional relationships 2. Integrate techniques of mindfulness into daily life to improve attention to personal well-being, reduce stress, and avoid burnout during residency training 3. Use self-reflective writing to increase self-awareness, broaden perspectives, and cultivate empathy 4. Apply mindfulness to clinical practice to improve patient communication, recognition of error-prone situations, and quality of medical care. Course topics include: 1) Self-awareness and Resiliency; 2) Leadership, Bias, and Collaboration; 3) Mindfulness in Patient Care: Self-care and preventing medical errors; and 4) Narrative Medicine. Learning of course topics will be accomplished with a combination of self-study educational resources and assigned readings, didactic lecture, skills workshops, writing exercises, and small group discussion. Each student will be required to complete a portfolio of reflective writing and surveys, which will be used in small group discussions. To monitor the effectiveness of the course content and teaching methods, students will complete pre- and post-course surveys. Prerequisites: Completion of all core clerkships.

MEDI 4087. Point of Care Ultrasound. 4 Credit Hours.

This elective is designed to introduce students to the use of diagnostic bedside ultrasound in the care of hospitalized medicine patients, and is paired with the Internal Medicine Residency Point of Care Ultrasound Elective. In addition to review of ultrasound physics and machine controls/transducers, students will obtain knowledge and skills in image acquisition, image interpretation and pitfalls/limitations of various cardiac, pulmonary, abdominal and vascular diagnostic ultrasound applications. Other topics include clinical integration of ultrasound skills into patients with shock, cardiac arrest, respiratory failure, and volume status abnormalities. Training will be accomplished with a combination of didactic lectures, provided self-study educational resources, image acquisition skills workshops at the Center for Clinical Ultrasound Education, supervised bedside ultrasound exams of hospitalized medicine/ICU patients and independent ultrasound scanning sessions. Each student is required to complete a portfolio of ultrasound examinations covering the scope of the course material, which will be reviewed with expert faculty on a weekly basis for quality assessment, image interpretation practice and further teaching. The elective is primarily designed for students pursuing residency with an adult inpatient focus. Students must have successfully completed Internal Medicine, Family Medicine, Surgery and Emergency Medicine clerkships before taking this elective.

MEDI 4103. Hematology for the Intern. 0.5 Credit Hours.

The Advanced Hematology course will be taught using case-based discussion. The first session will be a review of red blood cell and white blood cell abnormalities. The remainder of the sessions will focus on two to three specific cases of red blood cell or white blood cell disorders. Discussion will cover differential diagnosis, appropriate laboratory studies, clinical findings, and prognosis. Discussions will include adult and pediatric cases of various types of anemia, leukemia, myeloproliferative disorders, myelodysplastic states, plasma cell disorders, and lymphoma. The pass/fail grade will be determined by attendance and participation in group discussions.

MEDI 4105. Human Rights and Asylum Medicine. 4 Credit Hours.

This elective is geared toward fourth-year medical students interested in working with underserved populations and patients whose health is greatly affected by their personal histories of torture or other abuse, social conditions, and/or legal circumstances. The course's aim is to teach medical students to identify and assist survivors of abuse and to integrate a human rights viewpoint into their practice of medicine. This course will offer instruction on the legal process of refugee placement and application for asylum and for special immigrant juvenile status. It will provide training in diagnosing and evaluating medical evidence of human rights violations. Emphasis will be given to conducting an appropriate trauma-informed interview and physical and psychological examination of a patient with a history of torture or other abuse to complete a forensic evaluation for asylum in the United States. Prerequisites: MEDI 3105.

MEDI 4114. Combined Consultation Service In Geriatrics & Palliative Medicine. 0.5 Credit Hours.

This elective didactic course will introduce the basic elements of assessing a geriatric patient or a patient in need of palliative care in the in-hospital setting.

MEDI 4115. Palliative Care. 0.5 Credit Hours.

This MS4 didactic elective will focus on the main beliefs of palliative care, which include symptom control and end-of-life care in general and in specific populations, fulfilling the following educational principles, applicable to many other areas in medicine: * Communication skills instruction for medical students * Exposure to interdisciplinary teams (IDT) * Instruction in the multicultural practice of medicine.

MEDI 4120. Interpretation of Electrocardiograms. 0.5 Credit Hours.

This course consists of eight one-hour seminar sessions with active student verbal participation. Topics will include ECG basics, axis determination, analysis of rhythms, atrial arrhythmias, ventricular arrhythmias, conduction abnormalities, hypertrophy, ischemia, infarction, and vector analysis. The course will include examples of multiple ECG tracings for discussion, which will be moderated by the course director. Students will be called upon during the sessions to help interpret ECG tracings using the knowledge gained during the course didactics. The grade is based on student participation.

MEDI 4121. Intermediate Bedside Cardio Exam. 0.5 Credit Hours.

Course consists of 8 one hour sessions. Each session will include demonstrations of physical findings and their elucidation in patients with cardiovascular disease. Topics covered will include brief review of cardiac cycle, characteristics of innocent murmurs, systolic murmurs, diastolic murmurs, evaluation of arterial and venous pulsations, congestive heart failure, and self assessment. Grade based on class participation.

MEDI 4150. Tropical Medicine & International Health. 0.5 Credit Hours.

Course consists of 10 contact hours and will cover topics specifically related to health in the tropics and developing world. The course will consist of an introductory lecture and nine 1 hour small group case-based discussions. Students will prepare for the small group discussions through self-initiated study of the provided syllabus and faculty will lead the case-based discussion groups. Student grades will be determined by participation in the small group discussions (50%) and a final exam (50%).

MEDI 4151. Poverty, Health, And Disease Elective. 0.5 Credit Hours.

This elective course is offered to students who wish to gain insight into the complex interplay between poverty and health, both in the United States and in resource-limited settings around the world. The purpose of the course is to expose the students to several thought leaders and appropriate published literature, including books written to address these concepts. The course will explore the problems of inequality of access to health care and its impact on health delivery systems with examples from Guatemala, Haiti, and New Orleans. Open for Cross Enrollment on Space Available Basis.

MEDI 4153. Informatics and Advanced Evidence-Based Medicine. 0.5 Credit Hours.

The course is for students who want to master information and evidence. We will use the computer lab to learn advanced skills in: 1) retrieving information, 2) storing and filing information, 3) assessing information, and 4) keeping up with new advances. The skills will include both strategies and techniques. To pass the course, students must complete a small final project that previous students have enjoyed. In their project, they will publish on Wikipedia a short, structured summary of one article for a clinical topic. I will walk you through creating the edits. The edit can be done anonymously if the student prefers. By completing the project, the students learn the goals of the course. Credit for successful completion of the course requires active participation in class activities, a minimum of 100% attendance, and successful completion of final project.

MEDI 4155. Clinical Epidemiology for the Intern. 0.5 Credit Hours.

Clinical epidemiology – the basic science of clinical medicine that makes predictions about individual patients based on the occurrence of clinical events in groups of similar patients and using strong scientific methods to ensure that the predictions are accurate – is especially powerful in situations of medical uncertainty. Essential concepts and methods of clinical epidemiology are presented as they pertain to obtaining answers to clinical questions and guiding clinical decision-making with the best available evidence. A case-based approach is used to illustrate the relevance of clinical epidemiological approaches to decision-making about the care of individual patients. Learning activities incorporate both didactic, small-group problem solving approaches, and procedure skills (e.g., central venous line placement, incision and drainage of abscess, lumbar puncture, and thoracentesis). Credit for successful completion of the course will be based on attendance.

MEDI 4170. Internal Medicine Internship Readiness Elective. 4 Credit Hours.

This rotation (Internal Medicine Boot Camp) is a 4-week elective restricted to students who will begin a categorical internal medicine residency in July of that same academic year. The purpose of the course is to present the diagnosis and management of common medicine topics that an IM intern can expect to encounter during residency, enhance differential diagnosis skills of common chief complaints seen on a medicine service, and develop procedural skills and patient evaluation skills. Students are expected to attend all scheduled conferences and interactive laboratory and clinical sessions focused on procedural skills and clinical assessment of standardized patients. Clinical skills labs will include heart sounds using Harvey manikin, intubation, mechanical ventilation, PFT, joint aspiration and placement of central lines. Students will receive training in BLS and ACLS and can receive certification if all classes are attended and performance is satisfactory. Students are required to give an oral presentation on a medicine topic/clinical question. Students must meet expectations of clinical performance and professional behavior based on School of Medicine evaluation for fourth year students to "pass" course.

MEDI 4450. Compassionate Care for the Seriously Ill Longitudinal Elective. 2 Credit Hours.

This rotation offers exposure to the aging and seriously ill population through a longitudinal service-learning elective providing community service engagement through the "No one dies alone" volunteer program (NODA) at University Health System (UHS) and South Veterans Health Care System (STVHCS). Course participants will provide volunteer-role compassionate care to hospitalized aging and seriously ill patients in need through the NODA program; complete on-line learning modules to improve knowledge of the aging and seriously ill patient population; participate in debriefing sessions to integrate volunteer experience with course learning.

MEDI 7000. Off Campus. 4 Credit Hours.

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

Courses**MICR 4000. Special Topic. 4 Credit Hours.**

This is a self-designed course created by both the student and the department to cover a specific topic. A Course Approval Form must be completed along with documentation of the designed course description.

MICR 5025. Eukaryotic Pathogens. 1 Credit Hour.

The course will provide students with the opportunity to gain a basic comprehensive understanding of parasitology and mycology. The first part of this course will focus on virulence mechanisms and the host immune response with respect to a variety of parasites that cause major human diseases. The second part of this course will cover several important areas of medical mycology including molecular biology, diagnostic/epidemiology, mating/phenotypic switching, morphology, pathogenesis, and antifungal therapies.

MICR 5026. Bacterial Pathogenesis. 1 Credit Hour.

This is an introductory course in microbial pathogenesis focusing on bacterial pathogens that are important in human disease. Students will receive a foundation in the basic concepts and experimental approaches that are crucial for understanding the discipline through directed readings and didactic instruction. Specific concepts, strategies, and mechanisms used by human bacterial pathogens to cause disease will be illustrated.

MICR 5027. Immunology. 1 Credit Hour.

MICR 5027 is designed to build on the immunological concepts covered in MICR 5051 given in the Fall semester and to put those concepts to use as we focus on understanding the world of the mammalian host response to infection and on applying fundamental immunological concepts to the understanding of current immunological research questions in a student-presentation and in-class discussion format. Prerequisite: MICR 5051.

MICR 5028. Virology. 1 Credit Hour.

This course focuses on the molecular and cellular biology of animal viruses, and their interactions with host cells. Many of the viruses to be covered in this course are medically significant or have provided critical information that has expanded our understanding of cell biology, immunology, development, and differentiation.

MICR 5029. Building Scientific Thinking Skills. 2 Credit Hours.

The goal of this course is to provide the opportunity for graduate students to develop critical thinking skills in reading scientific literature, writing scientific grant proposals and manuscripts, and effectively communicating their own scientific ideas with peers. The course will be offered in three consecutive stages. First, each student will be assigned a scientific article focusing on a topic in the areas of Microbiology and Immunology and will give a 50 minute review presentation to the class. The content of the article will be discussed and reframed in the context of a grant proposal, followed by questions/critiques from fellow students and faculty members. Second, each student will be guided to develop a F31-style fellowship proposal on their chosen topic. Students are encouraged to work with their mentors to develop the proposal focused on their own research. The writing is expected to complete over the course of four weeks, after which feedback is provided by peers and MIMG faculty before a final draft is submitted. Finally, each student presents an oral mock qualifying exam (QE) defense of his or her final written proposal to the class and a mock QE committee composed of MIMG faculty members. This course is different from many other writing courses because it is designed to achieve multiple purposes: 1. Since the proposal writing and defense portions mimic the process involved in the MIM discipline QE with MIMG faculty, this course will serve as a practice for the QE (though all MIM students must write an entirely original QE proposal for actual QE); 2. Since the scientific proposal is fully spelled out and written in the format for F31 fellowship application, the student may use the same proposal for his/her F31 application; 3. Since the proposal focuses on the research of the thesis project, the discussions/critiques from the class will help the student to evaluate the feasibility and significance of his or her potential thesis project before investing too much into the project; 4. Finally, the three stages of this course have a long lasting impact on scientific skill development.

MICR 5031. Pathogenic Microbiology. 3 Credit Hours.

This lecture-only course integrates different disciplines (immunology, cell biology, genetics, biochemistry, molecular biology, physiology, and medical microbiology) with a central theme focused on molecular mechanisms of microbial pathogenesis in humans. Recommended prerequisites for this course are Biochemistry and Molecular Biology.

MICR 5035. Emerging Trends in Immunology and Infection. 2 Credit Hours.

An intense and advanced exploration of the primary literature focusing on the latest emerging trends in immunological research. The format will allow students to develop skills of in depth critical analysis and will involve a combination of student presentations of current data and discussions of the historical development and evolution of new directions in immunological research.

MICR 5051. Intro To Immunology. 2 Credit Hours.

This course is a study of immune responses with emphasis on experimental strategies for elucidating cellular and molecular mechanisms. Three phases of study: (1) immunochemistry and molecular biology of antibodies, lymphocyte receptors, and products of the major histocompatibility complex; (2) cellular interactions and immunoregulation; and (3) immunopathologies (hypersensitivity, autoimmunity, immunodeficiency, transplantation rejection, and tumor immunology). Prerequisites: consent of instructor, courses in General Biology and Genetics recommended.

MICR 5090. Research Progress Report. 1 Credit Hour.

This course allows students to present a progress report on their research project in a formal setting. Students present a 50-minute seminar to members of the Molecular Immunology & Microbiology Discipline and the Department of Microbiology, Immunology and Molecular Genetics. Students are challenged to think independently and critically through practice of asking and answering critical questions as they organize their presentation, and they evaluate each other's research findings. This course serves as a mechanism for the students to develop and practice oral presentation skills in a friendly environment, learn to explain experimental rationale, scientific methods, results and their significance to colleagues. Research Progress Report (RPR) serves as a vehicle to encourage student productivity within the laboratory. The seminars are videotaped for review by the presenters.

MICR 5091. Current Topics In Microbiology And Immunology. 0.5-3 Credit Hours.

Students will be given an opportunity to gain in-depth understanding of selected topics in microbiology and immunology through a combination of library research and discussion with faculty. Prerequisites: consent of instructor.

MICR 5092. Special Problems. 1-9 Credit Hours.

The course provides an opportunity for the student to engage in a special research project or to develop proficiency in the use of certain laboratory methods. Prerequisites: consent of instructor.

MICR 5095. Current Topics in Immunobiology and Host-microbe Interactions. 1 Credit Hour.

This course is designed to enhance and expand on the existing Research Progress Report (RPR) course (MICR 5090) that is required of all graduate students in the Molecular Immunology & Microbiology discipline of the IBMS Graduate Program. Although the RPR course allows students to gain experience with regard to making formal lecture presentations of their research, it is limited in that students present their work only once a year, the opportunity for full discussion is limited by the time available after presentations, and being a course in which participants are exclusively students, there are no opportunities to observe examples of how skilled seasoned investigators (i.e., faculty and postdoctoral fellows) present their work. In the currently proposed course, graduate students will not only have more frequent opportunities to present their own research and receive vital feedback and critiques, but will also hear and critique presentations by more senior investigators regarding projects performed in labs throughout the Department of Microbiology, Immunology & Molecular Genetics. Prerequisites: MICR 5090.

MICR 6026. Advanced Molecular Genetics Of Eukaryotic Pathogens. 2 Credit Hours.

This course will cover the major research methods and techniques used to study human fungal pathogens.

MICR 6030. The Microbiome & The Associated Metabolites in Health and Diseases. 2.5 Credit Hours.

This course provides an overview on the role of the microbiome and the associated metabolites in human health and diseases. It will focus on clarifying the conceptual framework for understanding how microbiome and the associated metabolites, particularly gut microbiome, impact human health and well-being. The course will also introduce students to the technologies and approaches used to study the microbiome and the associated metabolites in human and murine models. Prerequisites: MICR 5051 Open for Cross Enrollment on Space Available Basis.

MICR 6043. Advanced Topics In Virology. 2 Credit Hours.

This course is an in-depth study of selected topics in animal virology at the molecular level. Prerequisites: consent of instructor.

MICR 6050. Advanced Topics In Tumor Immunology. 1 Credit Hour.

This course provides an opportunity for students to gain a solid foundation in modern tumor immunology. Topics include tumor antigens, autoimmunity, mechanisms of killing, dysregulation of inflammation, and counter measures mediated by tumor to thwart or subvert host immunity.

MICR 6052. Advanced Immunobiology. 3 Credit Hours.

MICR 6052 is composed of 2 separate Modules that are designed to build on the immunological concepts covered in IBMS 5000 given in the Fall semester and to put those concepts to use as we focus on understanding the world of the mammalian host response to infection. In addition, students will gain a more detailed understanding of the current concepts, approaches, and applications of research in the field of immunology. Module 1 is devoted entirely to understanding fundamental concepts in immunology primarily through lectures and including some in-class discussion. Module 2 is focused on applying fundamental immunological concepts to the understanding of current immunological research questions in a student-presentation and in-class discussion format. Prerequisites: IBMS 5000 or consent of instructor. Open for Cross Enrollment on Space Available Basis.

MICR 6071. Supervised Teaching. 1-9 Credit Hours.

This course consists of teaching under the close supervision of instructors as laboratory assistants and as leaders in tutorial or review sessions. The more advanced students may present formal lectures in the classroom or lead discussions in the laboratory. Prerequisites: consent of chair or department.

MICR 6097. Research. 1-12 Credit Hours.

This course consists of independent, original research under the direction of faculty advisor. May be conducted in bacteriology, virology, mycology, parasitology, and immunology.

MICR 6098. Thesis. 1-12 Credit Hours.

Registration for at least one term is required of M.S. candidates. Admission to candidacy for the Master of Science degree is required.

MICR 7099. Dissertation. 1-12 Credit Hours.

Registration for at least two terms is required of Ph.D. candidates. In addition, Ph.D. candidates may be required to complete a course in Biostatistics. Prerequisites: Admission to candidacy for the Doctor of Philosophy degree.

Courses

NEUR 3005. Neurology Clerkship. 4 Credit Hours.

This core clerkship is designed to give the student experience in the evaluation, diagnosis, and treatment of patients with neurologic disorders. The format of the clerkship consists of three weeks on a variety of inpatient services and one week in the outpatient clinic setting. During the clerkship, students will attend didactics, grand rounds, and a lumbar puncture clinical skills lab. The student will be expected to participate in the complete care of assigned patients spending time at six possible inpatient services: UH wards, VA wards, UH stroke team, UH neuro-intensive care unit, pediatric neurology, and UH neurological consult service. Outpatient rotations will be in Neurology subspecialty or private practice clinics. Students will work with multidisciplinary teams in a variety of different settings, and they will be exposed to a variety of neurological disorders. The goal of the rotation is to allow the student to master the neurological exam and enhance their knowledge of the most common neurological diseases.

NEUR 4000. Special Topic. 4 Credit Hours.

This is a self-designed course created by the student and the department to cover a specific topic. This elective allows students to gain Neurology knowledge and experience through clinical or non-clinical venues depending on the goals of the student. Students may work with faculty on research, literature reviews, book chapters, quality improvement projects, etc. It can be taken as a 2-week or 4-week option, which will average 40 hours of activities per week. Prerequisites: NEUR 3005.

NEUR 4002. David Sherman Academy of Teaching Neurology. 4 Credit Hours.

A longitudinal medical student elective, David Sherman Academy of Teaching Neurology, provides the foundation for learning the principles of practical clinical teaching techniques and the opportunity to create a Neurologic educational product. Teaching is a skill and this class provides students with formal training to help them excel as effective clinical teachers via in person and online modules. There are three major objectives of this elective: (1) To learn teaching skills relevant to both clinical and non-clinical settings. (2) To gain mentored teaching experience in a variety of settings through completion of at least 5 sessions over the course of the year; (3) To complete an educational product of the student's choice with a measurement tool to assess the effectiveness of the project. This project may be incorporated into the future Neurology curriculum. This product may also meet criteria for the MD in Education Distinction (see below), but this is not a requirement; The student may choose to pursue the MD Distinction in Medical Education using the project designed for this elective if they also meet the following requirements: 1) Develop a measurement tool to assess the effectiveness of the educational project; 2) Submit the project for publication; 3) Display the project on a poster presentation; 4) Give a capstone presentation and reflective summary to the DIME Committee and advisors. Interested students can find details and deadline to apply at <https://www.uthscsa.edu/academics/medicine/education/ume/distinction-medical-education> Prerequisites: NEUR 3005.

NEUR 4029. Neurology Consultation Service. 4 Credit Hours.

Students are required to perform neurological consultations either at University Hospital or Audie L. Murphy VA Hospital. Attending rounds with the staff neurologist will be made daily Monday-Friday. Students are required to perform appropriately focused history and physical exam, prepare written and verbal presentations, interpret laboratory data, and develop differential diagnosis and management plans on all assigned patients. Students will also attend neurology didactics, and grand rounds. The student may participate in specialty clinics as assigned. The clinic exposure is designed to advance the knowledge and experience introduced in the Neurology Clerkship in specialty areas of neurology as directed by the students' interest and as availability allows. Both the inpatient consultation service and the specialty clinics provide understanding of and advanced experience in the application of systems of care and the coordination of a variety of care systems toward the optimal benefit of the patient. Prerequisites: NEUR 3005.

NEUR 4030. Neurology Subinternship - University Hospital & Audie Murphy VA. 4 Credit Hours.

The student will function as a sub-intern under the direct supervision of the Neurology resident. Considerable responsibility in the management of neurologic patients above the level of the core clerkship is provided on the inpatient ward services at the University Hospital or Audie L. Murphy VA Hospital. The student will participate in the evaluation of patients in the Emergency Department who are being considered for admission to the Neurology Ward service. The student will participate in short call and work at least one weekend day each weekend as allowed by the call schedule. Attendance at daily rounds, Neurology didactic conferences and Friday morning Neurology Grand Rounds is expected. If student is interested in completion of Neurology sub-internship in the Neurocritical care unit (NeuroICU), please register for NRSR 4035 under Neurosurgery. Prerequisites: NEUR 3005.

NEUR 7000. Away Rotation in Neurology. 4 Credit Hours.

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

Courses**NRSR 4010. Neurosurgery Elective. 4 Credit Hours.**

Senior students function as "interns" on the neurosurgery service. They admit and discharge neurosurgery patients. They perform history and physical examinations, and keep daily records on neurosurgery patients. They follow patients in the outpatient clinics, in the emergency department, in the intensive care units, and on general wards. They participate in operations for their patients. They participate in pre and post-operative care of neurosurgery patients. They present cases, attend all conferences, and take call as designated by the neurosurgery service. They mentor third-year medical students on the neurosurgery service. They learn how to obtain a history and perform a focused neuroexamination on a patient with brain and spinal cord injury. They are encouraged to participate in basic or clinical science research projects with neurosurgical faculty.

NRSR 4035. Neurocritical Care. 4 Credit Hours.

The goal of this elective is to give students exposure to the specialty of neurocritical care. Students will act in the role of intern, taking responsibility for a minimum of 2-3 patients. They will gain knowledge in the multi-system aspect of critical care along with the unique aspects relating to patients with central nervous system disorders/injury. Students will have ample opportunity for procedures including: arterial line placement, central line placement, intubation, bronchoscopy. They will also learn about ICP monitors, EEG and neuroradiology. Students will be supervised by interns and neurocritical care faculty.

NRSR 7000. Off Campus Rotation In Neurosurgery. 4 Credit Hours.

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

Courses**OBGY 3005. Obstetrics/Gynecology Clerkship. 6 Credit Hours.**

A clerkship consisting of gynecology and obstetrics is provided for medical students who have successfully completed the course in reproductive physiology and pathophysiology. The goal of the clerkship is to provide students with opportunities to prepare to function as a house officer capable of providing preventive care and treatment or competent to identify the patient's need for direction into an appropriate care environment. Supervised direct patient experience occurs in the obstetrical wards, operating room, labor and delivery suite, emergency room, and the obstetrical, gynecologic, family planning, and cancer detection clinics. A guide identifying instructional goals and the mechanisms to reach them is provided. Twenty-five seminars provide the opportunity for integration of clinical experience and didactic learning. In order to enroll, students must have successfully completed all required preclinical courses.

OBGY 4000. Special Topics. 4 Credit Hours.

This 4 week course will focus on a particular clinical topic in women's health as determined by the supervising faculty, student, and course director at least one month prior to the start of the course. The course may include outpatient and inpatient clinical settings, operating room, delivery room, community patient/provider education and outreach, curricular development in women's health, simulation, and some time for independent student study. Examples of potential topics include, but are not limited to, teen pregnancy, sexually transmitted infections, contraception and family planning, breastfeeding, women's preventive healthcare, surgical education in women's health, Team-based simulation in OBGYN, or any other OB/GYN related clinical topic. The student must choose a faculty preceptor in advance, and in conjunction with the course director, determine the topic, schedule, formats to be used, and required assignments for completion of the course. At the conclusion of the course, the student is required to submit a brief summary of their experience.

OBGY 4001. Obstetrical Externship. 4 Credit Hours.

This 4 week selective offers training and experience in the care of complicated and normal pregnancies and exposure to advanced obstetric techniques. It is designed primarily as a preparatory sub-internship for students anticipating residency in obstetrics and gynecology, and is primarily an inpatient course. The student will have the opportunity to be an integral member of the obstetric service and function at the junior intern level under the supervision of the obstetric faculty and residents. Opportunity for direct participation in labor and delivery, outpatient clinics (maternal-fetal medicine, diabetes, high-risk OB), operative obstetrics, and obstetric sonography is provided. The student is required to attend patient care conferences, didactic sessions, teaching rounds, and obstetric quality improvement conferences. The student will be required to give one formal seminar presentation on an obstetric clinical topic, and will participate in call on labor and delivery. Prerequisite: Completion of core clerkship in Obstetrics and Gynecology (OBGY3000 or equivalent) Additional prerequisite for visiting students is successful completion of USMLE Step 1 exam, satisfactory completion of all preclinical and clinical coursework.

OBGY 4008. Reproductive Health & Gynecological Surgery. 4 Credit Hours.

This selective is a primarily inpatient, surgically based sub-internship experience designed primarily for students planning to enter obstetrics and gynecology. The student will gain a broad experience in gynecologic care, perioperative care, and surgery. The student is required to be an active member of the gynecology service at the subintern level under the supervision of the faculty preceptor and the residents. Responsibilities will include participation in: 1) inpatient gynecologic surgeries and therapies; 2) outpatient procedures such as diagnostic laparoscopy, tubal sterilization, vaginal sonography, and hysteroscopy; 3) clinic-based care including annual gynecologic and breast examination, cancer screening, contraception, treatment of sexually transmitted diseases, common gynecologic problems, and preoperative planning; 4) treatment of acute gynecologic emergencies; and 5) patient care rounds, patient care conferences, and didactic lectures. The student will be required to deliver one formal presentation and will also participate in gynecologic emergency room call. Prerequisite: Completion of a core clerkship in obstetrics and gynecology (OBGY3001 or equivalent) For visiting students: successful completion of USMLE Step 1 examination and adequate performance on all required preclinical and clinical courses is also required.

OBGY 4009. Endo-Infertility Elective. 4 Credit Hours.

This elective offers training and experience in Reproductive and Infertility. It is designed as an advanced course for students who have completed the core clerkship in Obstetrics and Gynecology, are interested in reproductive medicine, and anticipate a residency in Obstetrics and Gynecology. The student is required to work with faculty in the Division of Reproductive Endocrinology participating in patient consultations for infertility and is required to observe ongoing management of infertility. In addition, the students are required to learn laboratory techniques associated with andrology as well as in vitro fertilization. Hands-on microsurgery laboratory experience will be available. The student is required to attend the weekly Combined Reproductive Endocrinology and Infertility Conference, be present for surgeries on the faculty service as well as on the resident service, and participate twice weekly in the infertility clinic at the Downtown University Outpatient Center.

OBGY 4010. Advanced Sonography. 4 Credit Hours.

This elective offers training and experience in Obstetric Sonography. It is designed as an advanced course for students who have completed the core clerkship in Obstetrics and Gynecology and who are interested and anticipate a residency in Obstetrics and Gynecology. The student is required to work with the faculty in the Division of Obstetrics participating in patient consultations and observe ongoing management of patients. In addition, the student will have the opportunity to obtain hands-on experience in sonography. The student is required to attend weekly Gyn Rounds and Cesarean Section Conferences.

OBGY 4012. Gynecology/Oncology. 4 Credit Hours.

This selective gives focused experience in surgical techniques as well as the critical care of gynecologic oncology patients. The goal of this rotation is to provide students with the opportunities to prepare to function as a house officer capable of diagnosing and managing patients with gynecologic malignancies. Students will also have the opportunity to prepare to become competent to identify a patient's need for direction into an appropriate care environment with a gynecologic/oncologist. The student is required to be a team member of gynecologic oncology service. It is a 7-term level under the supervision of gynecology/oncology faculty preceptors and the chief resident of that service. Responsibilities include inpatient gynecologic/oncology surgeries, inpatient gynecologic/oncologic critical care, outpatient gynecologic/oncology clinic care, gynecology-radiation/oncology conference(s), and gynecologic/oncology rounds.

OBGY 4013. Ob/Gyn Bootcamp. 4 Credit Hours.

The purpose of this elective is to prepare senior medical students who are interested in a career in obstetrics and gynecology for their internship. This elective is a "bootcamp" that provides practical "hands on" surgical training and valuable experiences so students are ready to perform day 1 of their residency. Prerequisites: Students are required to have passed their required MS3 obstetrics/gynecology clerkship.

OBGY 4014. Urogynecology. 4 Credit Hours.

This course would provide exposure to Urogynecology by working in the clinic and operating room setting by assisting in office urodynamics, evaluation of pelvic floor disorders and incontinence, and assist in operative management of these disorders. The schedule would consist of clinical practice with our Urogynecology faculty and fellow (3 days per week) and operative room experience for complex pelvic floor conditions (1-2 days per week). In addition, the student would be involved weekly resident didactic lectures and our department gynecology conference. Prerequisites: Successful completion of OBGYN 3rd year clerkship.

OBGY 7000. Off Campus. 4 Credit Hours.

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

Courses

OPHT 4000. Special Topic. 4 Credit Hours.

This is a self-designed course created by both the student and the department to cover a specific topic. A Course Approval Form must be completed along with documentation of the designed course description.

OPHT 4001. Clinical Ophthalmology. 4 Credit Hours.

The goal of the senior selective experience is to help the student learn how to perform an ophthalmological examination using external examination techniques, Schiotz, and applanation tonometry, the direct and indirect ophthalmoscope, gonioscopy, and refraction, and to become familiar with the common systemic disorders that have ocular manifestations. The student is required to learn to recognize and understand the treatment of the most frequently encountered ocular diseases. Attire: Unless otherwise stated, scrubs should be worn in an operating room environment or during call hours. Under no circumstances may scrubs be worn during clinics or for any academic related activities. Exceptions may be made, but as a general rule, the student should always ask their faculty advisor before wearing any non-professional attire. Call: While this is not required, taking first ophthalmology call is highly encouraged as it is an excellent example of ophthalmology resident duties. We encourage all medical students to discuss this with their faculty mentor and a first or second year resident.

OPHT 4003. Clinical Ophthalmology Research. 4 Credit Hours.

The student is required to design and carry out a clinical project, review of literature, chart review, etc., with approval and guidance by instructor. The student also is required to participate with faculty instructors in seeing private patients, observing surgery, scheduled teaching conferences and Journal Club.

OPHT 7000. Off Campus. 4 Credit Hours.

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

Courses

ORTO 4003. Selective In Hand Surgery. 4 Credit Hours.

The student participates as a team member on the Orthopaedic Hand Surgery Service of University Hospital. The student participates in the care of acute, traumatic, and elective reconstructive problems of the hand. Principles of examination of the hand and upper extremity, as well as patient management, are taught through clinical experience and gross dissection of the upper extremity. The student is required to attend core lectures on basic orthopaedics by orthopaedic faculty. No late drops. Prerequisite: ORTO 4005.

ORTO 4005. Trauma, Fracture & Clinical Care. 4 Credit Hours.

Participate as a member of an orthopaedic elective service team (including VA) for two weeks and two weeks as a member of the orthopaedic trauma service. On the elective service, the student will be assigned to a specific resident and faculty member to work in the outpatient clinics, on wards, and in surgery. Experience will emphasize both operative and nonoperative treatment. On the trauma service, the student will be assigned to a specific resident to work in the emergency room, trauma clinics, and operating room. Broad experience in assessment and care of extremity trauma will include fracture reduction and application of plaster casts. The student is required to also attend core lectures in basic orthopaedics by faculty. Reading material includes excerpts from Essentials of Musculoskeletal Care, as well as reading material required by a particular service. No late drops.

ORTO 4006. Adult Reconstruction In Orthopaedics. 4 Credit Hours.

Assigned to the Total Joint Service. Clinic exposure includes two half days of adult reconstruction clinic: one at UT Medicine and the second at University Clinic Downtown. Students are required to learn to conduct a thorough orthopaedic examination including preoperative and post-operative evaluations. Operative experience includes two or three days per week at University Hospital, Audie L. Murphy V. A. Hospital, and Santa Rosa Northwest. Students will scrub with and assist Dr. Marshall and/or Dr. Trick in the operating room. Procedures primarily include total hip and total knee replacement and revision as well as hip and knee arthroscopy. Learning objectives will focus on basic biomechanics, anatomy, and perioperative care. Will attend core lectures on basic orthopaedics by orthopaedic faculty. Reading material includes excerpts from Essentials of Musculoskeletal Care. No late drops.

ORTO 4008. Pediatric Orthopaedics SRCH/UH. 4 Credit Hours.

Students are assigned to work with one of the pediatric orthopaedic faculty for broad exposure in the essentials in pediatric orthopaedics. Students are required to attend outpatient clinics at Christus Santa Rosa Children's Hospital, University Clinic Downtown, and University Clinic. Students are required to perform preoperative workups, attend surgery, and attend conferences at Christus Santa Rose Children's Hospital. Both assessment and treatment of pediatric trauma, congenital conditions such as clubfoot and dislocated hip, spinal disease, and neurologic conditions such as cerebral palsy will be emphasized. Students are required to attend core lectures on basic orthopaedics by orthopaedic faculty. Reading material includes excerpts from Essentials of Musculoskeletal Care, as well as reading material required by a particular service. No late drops.

ORTO 4011. Sports Medicine Selective. 4 Credit Hours.

Students are assigned to the Sports Medicine Service. Students are required to participate in the knee rehabilitation clinic, weekly training-room visits, and attend surgeries. Introduction to the diagnosis and treatment of joint instability as well as care of the athlete will be made. Students are required to attend core lectures in basic orthopaedics by faculty. A brief review paper on a sports subject related to the student's chosen field of study, researched and submitted in rough draft, is required. Reading material includes excerpts from Essentials of Musculoskeletal Care. No late drops.

ORTO 7000. Off Campus. 4 Credit Hours.

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

Courses**OTOL 4000. Special Topic. 4 Credit Hours.**

Special topics in Otolaryngology-Head and Neck Surgery.

OTOL 4001. Head & Neck Surgery. 4 Credit Hours.

The course is a clinical experience in the outpatient, in-patient, and operative environments. The course is normally offered for those senior medical students who are interested in pursuing a career in the field, although the clinical experience is also valuable for students interested in primary care, ophthalmology, and applicable internal medicine subspecialties. The student clerk is a full participatory member of the clinical team and will gain valuable knowledge and experience in the diagnosis, medical, and surgical care of the patient with upper aerodigestive tract and related disorders. The student will have the opportunity to enhance her/his surgical technical skills, including emergency patient care. Clinical activities are available at both the University Hospital System and the VA Hospital. Clerkships at BAMC or WHAFMC are arranged through the institution's education office. Exposure to the breadth and depth of the field includes general and pediatric otolaryngology, rhinosinusology, head and neck oncologic surgery, otology, laryngology and bronchoesophagology, maxillofacial trauma, and facial plastic and reconstructive surgery.

OTOL 7000. Off Campus. 4 Credit Hours.

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

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

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

PATH 4002. Blood Banking. 4 Credit Hours.

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

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

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

PATH 4012. Cytopathology. 4 Credit Hours.

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

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

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

PATH 4015. Forensic Pathology. 2 Credit Hours.

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

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

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

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

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

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

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

PATH 5030. Oral Histopathology. 1 Credit Hour.

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

PATH 5035. Oral Pathology. 2 Credit Hours.

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

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

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

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

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

PATH 7000. Off Campus. 4 Credit Hours.

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

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

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

Courses**PEDI 3005. Pediatrics Clerkship. 6 Credit Hours.**

This third-year pediatric clerkship addresses issues unique to childhood and adolescence by focusing on human developmental biology, and by emphasizing the impact of family, community, and society on child health and well-being. Additionally, the clerkship focuses on the impact of disease and its treatment on the developing human, and emphasizes growth and development, principles of health supervision, and recognition of common health problems. The role of the pediatrician in prevention of disease and injury and the importance of collaboration between the pediatrician and other health professionals is stressed. During this clerkship, students spend time working in outpatient and inpatient settings.

PEDI 4000. Special Topic. 4 Credit Hours.

This is a self-designed course created by both the student and the department to cover a specific topic. A Course Approval Form must be completed along with documentation of the designed course description.

PEDI 4003. General Pediatrics Selective. 4 Credit Hours.

The goal of the General Pediatrics Selective is to teach medical students the knowledge and skills to understand human growth and development and its clinical application from infancy through adolescence; to take a complete, accurate, and culturally-sensitive history from children and their families; and to perform complete and problem-focused physical examinations of infants, children and adolescents for common acute and chronic pediatric illnesses. Students will communicate effectively in written and oral form with physicians, patient families, and clinic staff; describe the influence of family, community, and society on child health and disease; incorporate strategies for health promotion and injury prevention into patient care; and refer to and coordinate care with subspecialists and community agencies. Students will interpret common radiologic studies and perform office-based diagnostic tests and minor procedures. Students will be expected to demonstrate professional responsibility in working as a team member with other members of the General Pediatrics team, patients, and families. Students work Monday-Friday with faculty and residents in an academic clinic primarily in the acute care setting.

PEDI 4006. Pediatric Cardiology. 4 Credit Hours.

The goal of the Pediatric Cardiology Selective is to improve the student's understanding of the pathophysiology and management of pediatric and congenital heart diseases. Clinical skills in cardiac auscultation, EKG interpretation, and chest x-ray interpretation will be emphasized primarily in the outpatient setting. The student will observe noninvasive techniques in diagnosis such as echocardiography and invasive procedures in the cardiac catheterization laboratory. The student will participate in didactic instruction and online materials to improve knowledge and skills. The student is expected to research a cardiology topic during the rotation, and give a presentation on findings to the group at the end of the rotation. Student learning will be further enhanced by participation in weekly multidisciplinary patient management conferences. The student will be expected to demonstrate professional responsibility in working as a team member with other members of the Pediatric Cardiology care team, patients, and families.

PEDI 4009. Pediatric Gastroenterology/Nutrition. 4 Credit Hours.

The goal of the Pediatric Gastroenterology Selective is to increase the knowledge and skills of students in the diagnosis and management of gastrointestinal, liver, and nutritional disorders of children. Clinical teaching activity takes place in the inpatient setting, with opportunities to follow patients in the outpatient setting. The student will actively participate in evaluating and managing patients including observing endoscopy and other procedures if necessary. Required reading and discussion of study material with faculty will be expected. The student will participate in didactic sessions to enhance learning of common diagnoses. The student will be expected to demonstrate professional responsibility in working as a team member with other members of the Pediatric Gastroenterology team, patients, and families.

PEDI 4013. Pediatric Hematology/Oncology. 4 Credit Hours.

The goal of the Pediatric Hematology/Oncology Selective is to develop knowledge and skills in diagnostic evaluation, therapy, and follow-up of hematology/oncology patients. Clinical activities will take place primarily in the outpatient setting. This is an opportunity for experience in blood and bone marrow morphological diagnosis, in techniques for bone marrow aspiration, and in administration of intravenous and intrathecal chemotherapy. The student will work with a multidisciplinary team to meet the complex psychosocial needs of this patient population. The student is expected to demonstrate professional responsibility in working as a team member with other members of the Pediatric Hematology/Oncology team, patients, and families. Pediatric Clerkship is required prior to taking this course.

PEDI 4016. Pediatric Allergy, Immunology, And Infectious Diseases. 4 Credit Hours.

The goal of this Selective is to develop student skills in clinical and laboratory evaluation of hypersensitivity, infection, immunity, and inflammation, and in the management of allergic disease, infectious disease, primary and secondary immune deficiencies, rheumatologic conditions, and associated complicated complications. The scope of infectious diseases typically encountered includes community and hospital acquired infections, including post-surgical infections, infections in cancer and transplant patients, and HIV-infected children. The student will participate in outpatient clinics and inpatient consultations. The student will spend time in the laboratory covering bacteriology, virology, mycology, flow cytometry, and HLA typing. Scheduled conferences include weekly Case Management which will include presentation of patient cases to the faculty and care team. The student is expected to research a pertinent topic during the rotation and give a presentation on findings to the group at the end of the rotation. The student is expected to demonstrate professional responsibility in working as a team member with other members of the Pediatric infectious Disease, Allergy, and Immunology teams, patients, and families.

PEDI 4018. Child Neurology. 4 Credit Hours.

The goal of the Child Neurology Selective is to develop the knowledge and skills to evaluate and manage children with neurologic disorders. The student will distinguish normal from abnormal neurologic development; perform a skillful neurologic history and exam to distinguish normal from abnormal findings, peripheral from central nervous system lesions, and static from progressive neurologic dysfunction; identify temporary vs. chronic progressive neurological dysfunction; and recognize and manage neurological disorders that generally require referral. Students will be able to discuss the indications, side effects, and mode of action of commonly used medications in pediatric neurology; the indications for complex or expensive neurologic testing; and the pediatrician's role in prevention of neurologic disorders in children. Patient activity is primarily in the outpatient setting, but students will participate in consultations and care of select inpatients. Students are expected to demonstrate professional responsibility in working as a team members of the Pediatric Neurology care team, patient, and families.

PEDI 4020. Pediatric Endocrinology. 4 Credit Hours.

The goal of the Pediatric Endocrinology Selective is to develop the knowledge and skills needed to diagnose and manage disorders of thyroid/parathyroid, adrenal/gonad, growth (including hypopituitarism), and carbohydrate metabolism (including diabetes mellitus). Most patient care activity occurs in the outpatient setting with clinics focused on either diabetes (type 1, type 2, medial diabetes) or endocrine issues. Students will explain how to use a glucometer and insulin pump and how to perform growth and puberty stimulation tests. Directed reading is provided, and the patients are reviewed and the pertinent literature discussed at regularly scheduled conferences. Each student will present one interesting case at a weekly Case Conference. Students are expected to demonstrate professional responsibility in working as a team member with other members of the Pediatric Endocrinology team, patients, and families.

PEDI 4023. Neonatology. 4 Credit Hours.

The goal of Neonatology Selective is to gain the knowledge and skills needed to evaluate and manage preterm and term infants requiring intensive care. Students will work neonatologists and their staff in the Neonatal Intensive Care Unit and participate as a member of the neonatal response team in attending high-risk deliveries and admitting babies to the NICU. All aspects of the medical and nursing care of the high-risk or fragile newborn will be open to the student for study. The student is expected to function at the level of a sub-intern. The student will also be encouraged to participate in the support and instruction of families and gain understanding of "life beyond the NICU" for these special babies. The preceptor will guide the student in selecting appropriate reading to enhance the experiential component of the selective. The student is expected to demonstrate professional responsibility in working as a team member with other members of the neonatal team, patients and families. Weekend and night call schedules are integrated with those of the pediatric house staff. Students will work 6 days/week with 1 day off. As the 4th weekend is off, this translates to 3 days off during the rotation. These 3 days may be used for interviews; additional days off for interviewing should not be expected.

PEDI 4027. Pediatric Genetics. 4 Credit Hours.

The goal of the Pediatric Genetics Selective is to develop student knowledge and skills in diagnosing and developing management plans for children with single gene disorders, chromosome abnormalities, multiple congenital anomalies, metabolic disorders, teratogenic exposures, developmental delay, intellectual disability, and autism. Most patient activity is in the outpatient setting, but students will participate in inpatient consultations. Patient encounters range from 45 minutes to 2 hours in length depending on the patient and the chief concerns. Students will participate in multidisciplinary clinics, including craniofacial anomalies clinic. Training in differential diagnosis includes use of online genetics databases and resources. Students are expected to demonstrate professional responsibility in working as a team member with other members of the Genetics team, patients, and families.

PEDI 4029. Pediatric Pulmonology. 4 Credit Hours.

The goal of the Pediatric Pulmonary Selective is to develop the knowledge and skills needed to diagnose and manage common pediatric pulmonary disorders. The emphasis will be on how to obtain pertinent history, the recognition of physical signs of pulmonary diseases, CXR, and blood gas evaluation, and the critical assessment of the data gathered. Students will participate in outpatient pulmonary clinics, including cystic fibrosis and asthma clinics, and will follow pediatric inpatients with pulmonary disorders. The practice of evidence-based medicine will be emphasized. Regularly scheduled didactic sessions will expand on topics encountered in patient care. Students are expected to demonstrate professional responsibility in working as a team member with other members of the Pulmonary team, patients, and families.

PEDI 4031. Pediatric Nephrology. 4 Credit Hours.

The goal of the Pediatric Nephrology Selective is to develop skills in diagnosis and management of common renal disorders in children as well as significant participation in the management of dialysis and kidney transplant patients. The student will learn the essential concepts in the pathophysiology and management of fluid and electrolytes and acid base disturbances. Most patient care activity occurs in the outpatient setting, but students will also participate in the management of inpatients. The student will learn histopathology of renal diseases through reviewing biopsies with pathologists. The student is expected to demonstrate professional responsibility in working as a team member with other members of the Renal team, patients, and families.

PEDI 4036. Pediatric Critical Care. 4 Credit Hours.

The goal of the Pediatric Critical Care Selective is to develop the skills needed to evaluate and manage critically ill infants and children with medical and surgical diagnoses. The student will actively participate in a multidisciplinary team in the Pediatric Intensive Care Unit. Students will enhance their knowledge and skills in invasive procedures, principles of mechanical ventilation, principles of resuscitation, pharmacology of critical care, and the pathophysiology of these diseases. The student will serve as a sub-intern, participating in daily rounds with the attending pediatric faculty. Directed reading and didactic materials will be provided. The student is expected to demonstrate professional responsibility in working as a team member with other members of the Critical care team, patients, and families.

PEDI 4039. Child Abuse Pediatrics. 4 Credit Hours.

The goal of the Child Abuse Pediatric Selective is to increase the student's awareness that maltreatment is a common cause of many acute, delayed, and chronic physical and mental health conditions. The student will recognize demographic risk factors, but will see child abuse as a medical diagnosis made by the history and physical examination. The student will learn the history and physical exam necessary to evaluate concerns for injury and neglect and document in the correct medico-legal format. The student will learn the reporting mandate, and know how to report to the appropriate agency(s). The student will understand that abuse and neglect have immediate, short term, intermediate term, and long term effects that extend out into adulthood. Most patient care activity occurs in the outpatient setting, but the student may participate in emergency room and inpatient consults. The student will participate in staffing with CPS and other investigators and may have the opportunity to observe court hearings. The student is expected to demonstrate professional responsibility in working as a team member with other members of the Child Abuse Pediatrics team, CPS investigators, patients, and families.

PEDI 4040. Inpatient Pediatrics. 4 Credit Hours.

The goal of the Inpatient Pediatrics Selective is to prepare the student for pediatric inpatient wards during residency by enhancing knowledge and skills needed to evaluate and manage basic inpatient pediatric diseases as well as improving clinical skills such as oral and written case presentation, physical examination, hand-offs, and incorporating evidence-based medicine into clinical practice. The student will demonstrate knowledge of procedure skills including but not limited to conscious sedation, incision and drainage, and lumbar puncture. The student will function at the level of a sub-intern. The student will participate in the care of inpatients, small-group didactics, an online clinical reasoning skills module, and various organized educational activities. The student will also be expected to spend two weeks in nursery focused on teaching 3rd year medicals students and the evaluation and management of newborns. The portion of the rotation spend on the inpatient floor will require flexibility in scheduling with some night shifts possible given the current variability in patient volume. The student will demonstrate professional responsibility in working as a team member with other members of the Inpatient Pediatrics team, patients, and families and recognize the importance of working as a highly-effective team to deliver safe, efficient, care. Students must have completed all core clerkships.

PEDI 4041. Pediatrics Internship Readiness Elective. 2 Credit Hours.

This 2wk for-credit longitudinal elective course is an intensive preparation ("boot camp") for fourth-year medical students who plan to pursue a categorical Pediatrics Residency. Students who are pursuing a residency in Med-Peds or Child Neurology will also benefit from this course. The course will prepare students to function at the expected level of a Pediatrics Intern upon graduation from medical school. Students will be provided with general and specialty-specific, clinically relevant, and practical content in a variety of modalities, to improve clinical skills, communication skills, and engage in reflective practice. Course content will focus on the 13 core Entrustable Professional Activities (EPAs) as defined by the AAMC and will align with the defined Pediatrics-specific EPAs to prepare students for their future careers. Prerequisites include core pediatrics clerkships.

PEDI 4074. AHEC Clinic Experience. 4 Credit Hours.

The goal of the AHEC Clinic Experience Elective are to provide medical students with the knowledge and skills to understand human growth and development and its clinical application from infancy through adolescence; take a complete, accurate, and culturally-sensitive history from children and their families; and perform complete and problem-focused physical examinations of infants, children and adolescents for common acute and chronic pediatric illnesses. The student will interpret common radiologic studies and perform office-based diagnostic tests. Under the auspices of the UTHSCSA AHEC Program, this experience exposes students to the primary care of ambulatory patients at various AHEC clinical training sites in South Texas. Under the direct supervision of a Board Certified General Pediatrician, the student serves as the initial physician in the evaluation and management of a wide array of outpatient problems. This clinic experience may include associated inpatient experience, depending on the patient responsibilities of the physician. The student will be expected to demonstrate professional responsibility in working as a team member with other members of the pediatric team, patient and families. Information about training sites may be found on the AHEC websites: <https://stahec.uthscsa.edu/>. Student must first receive permission from the Department of Pediatrics before contacting the AHEC Office (567-7819). Application must be made 6-8 weeks in advance of the date on which you want to start the rotation. Once the rotation is confirmed by the AHEC Office, the student will be given electronic permission to go online and register for the course. On or before the first day of the rotation, the student will need to meet with Administrative Associate at the Center of South Texas Programs/AHEC Office (567-7819).

PEDI 4100. Nutrition Readiness For Internship. 0.5 Credit Hours.

This course will consist of four two-hour sessions that cover a variety of clinically oriented discussions and practical points of value to new interns. Topics are modified annually to cater for every year participants' areas of interest and upcoming internship. Reading material about topics of discussion will be distributed to students to review before the class to insure maximal participation in team based learning style. Topics to be covered: nutritional care of the surgical patient and TPN, nutrition in pregnancy, nutrition in special situations such as brain injury, encephalopathy, renal and liver disease, enteral nutrition and nutritional rehabilitation in growth and intestinal failure in short bowel patients.

PEDI 7000. Off Campus. 4 Credit Hours.

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

PEDI 7002. Pediatric Developmental Disabilities. 4 Credit Hours.

The goal of the Pediatric Developmental Disabilities Elective is to develop the knowledge and skills needed to assess and interpret findings of developmental-behavioral assessments, understand the neurological and genetic work-up, and become familiar with community resources for special needs children. The student will have the opportunity to participate in the developmental, neurological, and genetic evaluation of children with developmental-behavioral disabilities. Common developmental-behavioral disabilities encountered in this rotation may include Autism Spectrum Disorders, Attention-Deficit Hyperactivity Disorder, Global Developmental Delay, Intellectual Disability (formerly Mental Retardation), Learning Disabilities, Neural Tube Defects, and Cerebral Palsy. Patient care activity takes place in the outpatient setting. Students will also participate in key community site visits. In addition to core didactic sessions, students will have independent readings that complement their clinical activities. For electives occurring in June, July and August, the student will spend 1 week at Camp CAMP (Children's Association for Maximum Potential), a summer camp in the Texas Hill Country for children with a variety of disabilities. (All expenses are paid). Medical Students will be part of a medical team responsible for daily medical management of a "tribe" of children. The student must complete paperwork as required by Camp CAMP before attending.

PEDI 7012. Pediatric Community Preceptorship. 4 Credit Hours.

The goal of the Pediatric Community Preceptorship is to provide medical students with knowledge and skills to diagnose and manage patients found in the preceptor's practice; to understand the social, cultural, economic, and family forces which impact on the health status of children; and understand the community roles of the pediatrician, as a member of the health care team, and as an advocate for children. Students will actively participate in patient care in the office practice of board-certified pediatrician preceptors. Preceptorships are available with general pediatricians or with subspecialists. Preceptorship experience must be scheduled well in advance and may be 2 or 4 weeks in length, students must arrange to work with a preceptor before contacting the department for permission. All preceptors must have an adjunct faculty appointment with a medical school.

Courses**PHAR 4000. Special Topic. 1-42 Credit Hours.**

This is a self-designed course created by both the student and the department to cover a specific topic. A Course Approval Form must be completed along with documentation of the designed course description.

PHAR 5013. Principles Of Pharmacology & Physiology 1. 3 Credit Hours.

Topics include principles of drug action; receptor classification and quantitation; dose response relationships; cellular mechanisms of drug action; fundamental concepts of drug receptor interactions; voltage gated and ion channels; drug actions mediated by transduction and non-transduction enzymes; time course of drug action; absorption, distribution, biotransformation and elimination of drugs; pharmacokinetics; and experimental approaches to drug action.

PHAR 5014. Integrative Physiology & Therapeutics. 4.5 Credit Hours.

This course provides students with a base of knowledge in physiology and pharmacology taking an integrative approach to understanding experimental and clinical therapeutics. Primary focus will be on understanding normal physiologic functions, cellular mechanism underlying disease, and systematic consideration of the pharmacology, clinical applications, and toxicities of the major classes of drugs. This required 4.5 credit hour course for Pharmacology and Physiology students is comprised of three sections, each covering major areas of physiology and pharmacology along with their corresponding therapeutics. The three sections include: 1) autonomic nervous system control and therapeutics, 2) cardiovascular, renal and respiratory physiology and therapeutics, and 3) metabolism, hormones, GI physiology and therapeutics. Each section is to be offered separately as an independent micro-elective for students from other programs within the Graduate School of Biomedical Science. Prerequisites: IBMS 5000 and PHAR 5013.

PHAR 5018. Cardiovascular, Renal and Respiratory Physiology and Therapeutics. 2 Credit Hours.

This course covers the anatomy, physiology and pharmacology of the heart, the blood vessels, kidneys, and airways and lungs. Specific areas include: 1) normal physiology of the cardiovascular system and mechanisms underlying its major pathologies such as atherosclerosis, hypertension, heart failure and stroke, as well as the major classes of drugs (antihypertensives, anti-lipemics, anti-anginals, and anticoagulants) to treat these primary cardiovascular disorders. 2) importance of the kidneys in maintaining body electrolyte and water balance, and examples of cardiovascular and kidney diseases that are targets for important therapeutic drugs such as the diuretics and ACE inhibitors. 3) respiratory physiology and drugs used in the treatment of asthma and chronic obstructive pulmonary disease. Prerequisites: IBMS 5000 or equivalent.

PHAR 5019. Metabolism, Hormones, GI Physiology and Therapeutics. 2 Credit Hours.

This course provides an overview of the following: 1) physiology of major endocrine systems, including pituitary, thyroid, GI and renal hormones, etc. It covers endocrine regulation of stress, blood sugar, male and female fertility, calcium balance, growth, pregnancy, and appetite. Pharmacological approaches to management of diseases caused by defects in metabolism (e.g. diabetes) and hormonal regulation (e.g. thyroid disorders), as well as sex steroids and adrenal steroids, will be discussed. 2) mechanisms and regulation of digestion/acid secretion and nutrient absorption by the GI tract along with pharmacological management of GI diseases, including GERD, peptic ulcer, etc. Prerequisites: IBMS 5000 or equivalent.

PHAR 5020. Basics Of Research Design. 2 Credit Hours.

This course aims at teaching first-year graduate students fundamentals of research design and analysis of scientific literature to orient them with setting up scientific experiments and writing grant proposals. The course is divided into three sections: research design, communicating scientific data, and getting scientific ideas funded.

PHAR 5021. Autonomic Control & Therapeutics. 0.5 Credit Hours.

This course covers basic anatomy, physiology and pharmacology of the autonomic nervous system, including its higher order CNS components of the ANS in the regulation of homeostasis. Diseases that involve alterations in ANS function and drugs that modulate catecholaminergic and cholinergic neuro-effector transmission will be discussed.

PHAR 5023. Drug Discovery and Development. 3 Credit Hours.

This course provides students with an understanding of the overall process of drug discovery and development. It covers the basic principles of how new drugs are discovered, how drugs interact with their biological targets, and application of medicinal chemistry in lead optimization. Focused lectures on specific therapeutic areas will include drug development for cancer, diabetes, pain, and psychiatric disorders. Patenting, phase 1, 2 and 3 clinical trials, and marketing processes will be covered, as will contract opportunities for basic science researchers with drug companies. Case studies of both successful and unsuccessful drug candidates will be presented, where students will learn about the entire drug discovery and development process. Upon successful completion of this course, students will have a comprehensive knowledge of the fundamental principles of drug discovery and development, leading to successful implementation of the new drug in the clinic.

PHAR 5024. Principles of Pharmacology 1. 1.5 Credit Hour.

Principles of Pharmacology 1 is a 1.5 credit hour course that provide students with fundamentals of Pharmacokinetics and Pharmacodynamics. The course covers basic principles of Drug Disposition (Absorption, Distribution, Metabolism and Excretion), Dose-Response and Therapeutic Window, an overview of Pharmacogenomics, Ligand-Receptor Interactions (saturation, competition and kinetic binding methods), Affinity, Occupancy-Response Theories, Agonism and Intrinsic Efficacy, Antagonism, Allosterism, Constitutive Receptor Activity and Inverse Agonism, and Multi-Active State Models and Functional Selectivity. Upon successful completion of this course, students will have a comprehensive knowledge of the core principles of pharmacology. Open for Cross Enrollment on Space Available Basis.

PHAR 5025. Principles of Pharmacology 2. 1.5 Credit Hour.

This course will provide students with fundamentals of Pharmacodynamics. The course covers basic concepts of receptor (7 transmembrane-spanning, receptor tyrosine kinase, nuclear, and ligand-gated ion channels) and transporter function and includes lectures on principles of systems pharmacology, including Cancer Pharmacology, Immunopharmacology, Alzheimer Disease Pharmacology. Additional topics include principles of chronic drug treatment and the pharmacological consequences of mixtures of drugs. Upon successful completion of this course, students will have a comprehensive knowledge of the core principles of systems pharmacology. Prerequisites: PHAR 5024 Open for Cross Enrollment on Space Available Basis.

PHAR 5090. Seminar. 1-9 Credit Hours.

This course consists of presentation and discussion of recent advances in research by staff faculty, students, and outside scientists. A monthly journal club that emphasizes student presentations of current primary literature is also a component.

PHAR 5091. Special Topics: Microelectives. 0.5-9 Credit Hours.

Micro-electives are courses that can be of any type (tutorial or original literature review, short [2-week] didactic, technique, etc.). In general, since they are short, they are often offered at any time of convenience between the student(s) and the faculty. Various topics include but not limited to: (1) New Views on Monoaminergic Neurotransmission: Are Transporters Important?; (2) Drug Discovery: Nuts and Bolts; (3) Historical Perspectives of Receptor Theory; (4) Cell Membrane Microdomains and Signaling; (5) Neuropeptide Metabolism; (6) Serotonin: From Soup (Transmission) to Nuts (Behavior); (7) Central-Cardio-Respiratory Systems; (8) Neural Substrates of Regulatory Behaviors: Peptides and Monoamines; (9) Current Issues in Basic Research on Mechanisms of Epilepsy; (10) Appetite Control: Adiposity Hormones and Neuropeptides; (11) Fundamentals of Behavioral Pharmacology; (12) Therapeutics: Autonomic Pharmacology; (13) Therapeutics: Cardiovascular-Renal Pharmacology (Prerequisite - PHAR 5091.012); (14) Therapeutics: Central Nervous System Pharmacotherapeutics; (15) Therapeutics: Chemotherapy; (16) Therapeutics: Endocrine Pharmacology; (17) Therapeutics: Pharmacological Management of Pain; and (18) G protein-coupled receptor heteromers.

PHAR 5092. Special Problems In Pharmacology: Research Practicum. 1-9 Credit Hours.

This is a full-semester research experience for the principal investigator to evaluate if a student demonstrates the potential for productive and independent investigation during the summer following the first year. The course concludes with a 15 minute oral presentation given by the student and a written report in a journal style.

PHAR 6005. Drugs in Society. 2 Credit Hours.

This course will provide an overview of the basic neuropharmacology, preclinical pharmacology, epidemiology, as well as legal and social issues associated with alcohol and the major classes of abused drugs. The course will be team taught by several faculty members from the Departments of Pharmacology, Physiology, and Psychiatry. The format will include lectures, videos, and group discussion. The major drug classes that will be discussed include the following: 1) alcohol, benzodiazepines, and barbiturates; 2) nicotine (tobacco and other delivery systems); 3) marijuana and other cannabinoids; 4) opioids; 5) stimulant drugs including cathinones; 6) ketamine and related drugs; 7) hallucinogens; and 8) dietary supplements and over the counter medications. Readings will include scientific original and review articles, selected chapters in books (e.g., *Drugs, Society, and Human Behavior*, McGraw-Hill), as well as blogs and recent government and news agency publications as they become available and are relevant.

PHAR 6015. Effects, Power, Meta-Analysis. 1 Credit Hour.

Evaluating the statistical significance of research findings requires knowledge of statistics, but additional skills are needed to evaluate their importance. This course introduces tools that help answer three questions: 1) How do I assess the practical or everyday significance of my research results, 2) Does my study have sufficient power to find what I am seeking, and 3) How do I draw conclusions from past studies reporting disparate results. Answering these questions involves estimation of effect size, calculation of statistical power, and pooling of individual effect size estimates by meta-analysis. This course discusses these activities together, because they are interrelated. A well-designed study is normally based on a prospective power analysis, and a good power analysis will ideally be based on a meta-analytically derived mean effect size. There is a growing recognition by scientific journals and funding agencies of the need to report effect sizes along with the results of test of statistical significance and to quantify the statistical power of studies. The aim of this course is to help acquire the skills necessary to meet these needs. This micro-elective builds on the significance-testing and power analytic skills that students learn in CSAT 5095 Experimental Design and Data Analysis. Thus, having taken CSAT 5095 is a prerequisite for this course.

PHAR 6020. Molecular & Pharmacological Basis Of Therapeutics. 3 Credit Hours.

This course provides the graduate student with current knowledge of how genetic variants can affect drug response and the potential to optimize drug therapy. Course format will include lectures, discussion of selected literature, individual student presentations, and the opportunity for the development of a mini pharmacogenetic/genomic protocol and consent form to address a clinical/biomedical question mutually agreed upon between course director and students.

PHAR 6021. Pharmacological Basis of Therapeutics. 1 Credit Hour.

The course provides students with an understanding of how pharmacological knowledge is applied in rational therapeutics. The course begins with principles of drug effect and disposition that apply to all medications, so that student will be able to develop an understanding of the pharmacological basis of therapeutics. Using specific disease states as examples, the course will address major classes of pharmacological agents affecting the cardiovascular and the central nervous systems. Other pharmacological areas covered include medications affecting the autonomic nervous system and treating cancer. Classical (adverse drug reactions) and more recent (pharmacogenomics) pharmacological topics will also be covered.

PHAR 6025. Molecular Pharmacology. 2 Credit Hours.

This course will be presented in a journal club/paper discussion format and will focus on the molecular aspects of pharmacology, with emphasis on molecular biology, biochemistry, and cell biology of a variety of physiological systems subjected to pharmacological manipulation. The topics to be discussed will include molecular mechanisms of drug action, signal transduction and regulation, molecular approaches, and recent advances in areas of molecular pharmacology.

PHAR 6027. Fundamentals Of Neuroethics. 1 Credit Hour.

Recent advances in neuroscience have considerably improved our understanding of brain function. However, the fascinating examination of brain's mysteries often intersects with the concerns of ethics and public policy. This course aims at presenting and discussing philosophical and scientific perspectives on major bioethical issues pertinent to neuroscience research. Several subjects will be covered in the course, including the effects of pharmacological and surgical interventions on the brain/min binomial, therapy versus enhancement, brain imaging and mental privacy, neurobiology of decision making, consciousness, unconsciousness, and death.

PHAR 6071. Supervised Teaching. 1-9 Credit Hours.

This course provides a mentored teaching experience. The student will be responsible for directing an undergraduate Physiology laboratory course under the guidance of the Physiology faculty. The student will prepare and provide limited lectures addressing background information required to understanding and performing research laboratories, as well as direct undergraduates in performance of these laboratories. Physiology faculty will insure that graduate students are prepared and knowledgeable about the laboratories they will direct. In addition, students will receive training in general pedagogy and specifically, in the performance, conduct, and directing of physiology research and its dissemination. In addition to learning to direct a laboratory course and providing lecture-based information, graduate students will be trained in preparing, administering, and marking laboratory exams.

PHAR 6097. Research. 0.5-12 Credit Hours.

Independent, original research under the direction of a faculty advisor.

PHAR 6098. Thesis. 1-12 Credit Hours.

Registration for at least one term is a Graduate School requirement for all MS candidates.

PHAR 7002. Bridging The Gap From Bench To Bedside: Pharmacology Clinical Practicum. 1 Credit Hour.

Pharmacology is the most basic of the science disciplines to bridge the gap between "bench and bedside." This micro-elective will provide students with focused exposure to therapeutics and clinical practice. The course will incorporate case-based, operating room scenarios using human simulator mannequins, with a clinical experience in association with the Department of Anesthesiology. Students must directly contact the course director before registering for this course.

PHAR 7003. Electrophysiology In Neuroscience Research. 1 Credit Hour.

The purpose of this course is to explore the rationale underlying the use of electrophysiological techniques in neuroscience research. Rather than focusing on the technical aspects of electrophysiology, this course will discuss current hot topic manuscripts that utilize different electrophysiological approaches including in vivo (anesthetized and conscious), in vitro, extracellular (single-unit and field potential), intracellular and patch. It is anticipated that at the end of the course students will be more familiar with the area of electrophysiology and able to understand why particular approaches are utilized in neuroscience research and be able to critically review electrophysiological data from manuscripts.

PHAR 7009. Pharmacotherapeutics. 1.5 Credit Hour.

The emphasis of this course is on understanding the rationale, indications, and contraindications for prescribing pharmacologic agents in dentistry. Consideration of the pharmacologic agents that the patient may be taking at the time of the dental visit is emphasized.

PHAR 7099. Dissertation. 1-12 Credit Hours.

Registration for at least two terms is a Graduate School requirement for all Ph.D. candidates. Prerequisites: admission to candidacy for Doctor of Philosophy degree.

PHAR 8009. Pharmacotherapeutics. 2 Credit Hours.

The emphasis of this course is on understanding the rationale, indications, and contraindications for prescribing pharmacologic agents in dentistry. Consideration of the pharmacologic agents that the patient may be taking at the time of the dental visit is emphasized.

Courses**PHYL 3014. Research in Endocrinology of Aging. 0 Credit Hours.**

The course consists of student participation in research on glucocorticoid-induced gene expression during aging and food restriction.

PHYL 3016. Ion Channel Research. 0 Credit Hours.

The course includes student participation in ongoing basic research on the molecular mechanisms of signaling pathways acting on ion channels. Techniques may include patch-clamp, electrophysiology, molecular biology and biochemistry.

PHYL 4000. Special Topic. 1-42 Credit Hours.

This is a self-designed course created by both the student and the department to cover a specific topic. A Course Approval Form must be completed along with documentation of the designed course description.

PHYL 4012. Molecular Endocrinology Research. 4 Credit Hours.

The course consists of student participation in research on glucocorticoid-induced gene expression during aging and food restriction.

PHYL 4016. Ion Channel Research. 4 Credit Hours.

The course includes student participation in ongoing basic research on the molecular mechanisms of signaling pathways acting on ion channels. Techniques may include patch-clamp, electrophysiology, molecular biology and biochemistry.

PHYL 5017. Discovery Of Physiological Principles 3. 2 Credit Hours.

This course consists of laboratory demonstrations and experiments in areas covered in Organ Systems Physiology 2 and acquisition of skills for analyzing and communicating the results of laboratory research. Corequisites: PHYL 5025.

PHYL 5025. Organ Systems Physiology 2. 4 Credit Hours.

This course is a continuation of the study, begun in Organ System Physiology 1, of the mechanisms that produce and control the functions of the body's organ system. Prerequisites: PHYL 5011, PHYL 5014, PHYL 5021, and PHYL 5024.

PHYL 5028. Fundamentals of Physiology. 2 Credit Hours.

Fundamentals of Physiology is a 2 credit hour course designed to provide students with a basic understanding of mammalian physiology. Students will be exposed to overarching concepts and contemporary perspectives regarding the normal function (physiology) of the organs and systems of organs of the human body. Lectures will focus on fundamental functions of the cardiovascular, renal, respiratory, gastrointestinal and endocrine systems. This course aims to blend targeted student learning outcomes with critical thinking skills to enhance student understanding of integrative systems biology as an aid to success in the field of biomedical research. Upon successful completion of this course, students will have knowledge of physiological principles of individual organs and systems and a basic appreciation for how interactions between these systems integrate to subserve healthy function. This course is centered on the principle that doctoral students must take personal responsibility for their own learning. As an upper level course, all lectures will be interactive. Lectures will be built around assigned readings. Therefore, each student will be expected to actively engage with faculty and fellow students during lectures to facilitate and enhance the learning experience. Prerequisite: IBMS 5000 or at the discretion of the course directors.

PHYL 5030. Biology of Pain. 2 Credit Hours.

Biology of Pain is a 2.0 credit hour course that provide students with fundamentals of sensory transduction and pathways for pain. It covers the basic principles of how sensory neurons are regulated at the periphery as well as centrally, how pain is perceived in the brain and different therapeutic options of pain management. This course will be divided into specific lectures focused on neuronal and non-neuronal involvement, peripheral and central pathways of pain, assessment, pharmacology and treatment of pain as well as several important clinical states causing pain in various diseased conditions. Upon successful completion of this course, students will have a comprehensive knowledge of the core principles of physiology, basic biology and pharmacology of pain. Prerequisites: IBMS 5000 or at the discretion of the course directors.

PHYL 5041. Excitable Membranes. 1 Credit Hour.

This course addresses fundamental mechanisms of cell excitability in neurons and other excitable tissues. The format is a combination of lectures, readings, discussions, a laboratory demonstration, and online simulations (where available). Examples of the latter include activities to simulate the resting membrane potential and action potentials. The module will emphasize contemporary issues in the scientific literature as well as translational science where dysfunction in ion channels underlie common disorders such as Alzheimer's Disease, Myasthenia Gravis, Cystic Fibrosis, Long QT Syndrome, and Epilepsy to name just a few. PHYL 5041 is a co-requisite for Fundamentals of Neuroscience I as it is the first module of that course, but it also can be taken as a standalone one-hour course.

PHYL 5042. Cardiovascular Physiology. 1 Credit Hour.

This course explores the physiological mechanisms by which the cardiovascular system carries out its principle function. Mechanisms that produce and regulate cardiac pumping, organ blood flow, capillary fluid and solute exchange, and arterial blood pressure are examined. The nature and importance of various local, neural, and hormonal mechanisms are emphasized. Integrated control of cardiovascular function in situations requiring cardiovascular adjustments (e.g., exercise, blood pressure alterations) are also covered. Students may take the full series but are only required to take three out of the four courses (PHYL 5041, 5042, 5043, and 5044).

PHYL 5043. Respiratory & Renal Physiology. 1 Credit Hour.

This course covers the physiology of respiratory and renal function in the human body. Our focus is on basic mechanisms of function, role in body homeostasis, as well as dysfunction of both systems associated with pulmonary and renal disease. Two sessions are set aside for discussion around significant advances in each field. One or more recently published articles will serve as the focus for each of these discussions sessions. Students may take the full series but are only required to take three out of the four courses (PHYL 5041, 5042, 5043, and 5044).

PHYL 5044. Metabolism/Hormones/GI System. 1 Credit Hour.

The course serves to expose students to the current state of knowledge in the field of endocrinology and metabolism, including reproductive physiology, and the related topics of the physiology of the digestive tract. Three sessions are assigned to advanced topics. In these three sessions students will engage in a discussion format centered around one recent important publication. The lecturer will lead the discussion with the aim of showing how the topics the students have been exposed to integrate one with another, providing the context for present-day discoveries.

PHYL 5045. Mammalian Physiology. 4 Credit Hours.

The course begins with fundamental processes that govern membrane transport, membrane potential, and excitation-contraction coupling. The course then proceeds to coverage of organ system function including cardiovascular, respiratory, renal, gastrointestinal and endocrine/metabolic physiology. Lecture material is enhanced by supplemental discussion of research literature encompassing molecular biology, integrative function, and pathophysiological implications. Students may take the full course but are only required to take three out of the four modules (PHYL 5041, 5042, 5043, and 5044).

PHYL 6020. Regulation of Glucose Metabolism. 3 Credit Hours.

The normal regulation of glucose metabolism will be reviewed integrating whole body, organ, cellular, and molecular control mechanisms. Dysregulation of these control mechanisms in diabetes and other common metabolic disorders such as obesity and the metabolic syndrome will be examined in detail. State-of-the-art in vivo and in vitro techniques essential for the study of normal and deranged glucose homeostasis will be discussed in depth. Diabetic microvascular (nephropathy, retinopathy, neuropathy) and macrovascular complications and their relationship to impaired glucose metabolism will be reviewed. Lastly, pharmacologic therapy of diabetes and its associated complications will be discussed.

PHYL 6070. Teaching Assistant. 1 Credit Hour.

This course provides a mentored teaching assistant experience to graduate level physiology coursework. The student will assist faculty members with classroom instruction, proctoring quizzes and exams, record keeping and other miscellaneous projects. Students will learn to create appropriate classroom materials, including syllabus, quizzes and exam questions. Physiology faculty will ensure that graduate students are prepared and knowledgeable about their responsibilities. If student does not have prerequisite, they may also register at the discretion of the course director, and with mentor approval. Teaching Assistants will be responsible for organizing and leading two exam review sessions. This will include interacting with students to determine their individual weakness and developing appropriate content to address these issues. This content can include additional didactic material, problem sets, or reading. Teaching Assistants will hold office hours by appointment with the students. Prerequisite: PHYL 5028.

PHYL 6071. Supervised Teaching. 1 Credit Hour.

A student enrolled in this course is expected to participate in the teaching program of the Department.

PHYL 6090. Seminar. 1 Credit Hour.

The course is comprised of research presentations by Physiology graduate students. This course is required of all students each semester.

PHYL 6091. Selected Topics Of Physiology. 2 Credit Hours.

Students must take a least two courses selected from among the offerings in: (1) Cardiovascular; (2) Cell Biology in Neural Science; (3) Endocrine and Metabolism; (4) Molecular Physiology; and (5) Ion Channels in Disease. Courses that may be substituted for one of these selections: (1) INTD 5040 - Fundamentals of Neuroscience I: Molecular, Cellular, and Developmental Neuroscience; (2) INTD 5043 - Fundamentals of Neuroscience II: Systems Neuroscience; (3) CSBL 6048 - Biology of Aging; and (4) CSBL 6058 - Neurobiology of Aging. Not all selected topics are offered each semester. Please discuss this with the Academic Coordinator for more details. Substituted courses in conflict with Physiology course schedule will require approval from COGS.

PHYL 6097. Research. 1-12 Credit Hours.

If a track chooses to give a seminar course, the specific course requirements will be determined by the track. The sub-designations for each track are: (1) Biology of Aging; (2) Cancer Biology; (3) Cell & Molecular Biology; (4) Genetics, Genomics & Development; (5) Membrane Biology & Cell Signaling; (6) Metabolism & Metabolic Disorders; (7) Microbiology & Immunology; (8) Molecular Biophysics & Biochemistry; (9) Molecular, Cellular, & Integrative Physiology; (10) Neuroscience; and (11) Pharmacology.

PHYL 6098. Thesis. 1-12 Credit Hours.

Registration for at least one term is required of M.S. candidates. Prerequisite: admission to candidacy for Master of Science degree.

PHYL 6291. Seminar 2. 1 Credit Hour.

Presentation and discussion of recent research advances by outside scientists.

PHYL 7099. Dissertation. 1-12 Credit Hours.

Registration for at least two terms is required of Ph.D. candidates. Prerequisites: admission to candidacy for the Ph.D. degree.

Courses

RADI 4000. Special Topic. 4 Credit Hours.

This course is intended for 4th year medical students interested in Radiology Residency and Radiology Research opportunities. Students must contact the coordinator prior to committing to this course. A designated faculty member will be assigned to the student prior to enrollment.

RADI 4001. General Diagnostic Radiology. 4 Credit Hours.

This course is designed as an introduction to diagnostic radiology. The primary goals of the course are directed toward introducing the student to the different diagnostic imaging modalities available and teaching the student to select the appropriate radiologic examinations for different clinical problems. Students will have the opportunity to receive a working knowledge of diagnostic radiology through lectures, individual projects, reading assignments, participation in subspecialty rotations, teaching conferences, and study of the American College of Radiology teaching file.

RADI 4006. Pediatric Radiology. 4 Credit Hours.

By being with the pediatric radiologist on a one-on-one basis through most of the working day, the student will have the opportunity to gain some insight as to the radiologist's role as a clinician, consultant, and teacher; and acquire some knowledge of general pediatrics, neonatology, urology, orthopaedics, and other specialties. The student may attend Diagnostic Radiology Lectures.

RADI 4007. Review Of Radiology for the Intern. 0.5 Credit Hours.

This is a refresher course in Clinical Diagnostic Radiology. In a large group format, a Radiology faculty member will review with the participants the basics of evaluating the chest X-ray, chest CT, abdominal CT, spinal, head, and pediatric cases. In addition, time will be spent on reviewing the appropriate studies to order for the work-up of various clinical scenarios.

RADI 4020. Mammography- A Multidisciplinary Approach. 4 Credit Hours.

This elective is intended to educate students in the subject of mammography with a multidisciplinary approach. Students will be allowed to spend 2 days each week in medical oncology, surgical oncology, or radiation therapy. Students will primarily be assigned to the mammography section of radiology, learning what criteria are used to detect breast cancer and participating in the work-up of lesions and witnessing biopsies. In addition, they will attend tumor board once a week that is multidisciplinary one day per week will set aside for library student and the students will be asked to research a topic or participate in a project regarding mammography. We intend that this elective will thoroughly educate those who are interested in mammography and help them understand how our specialty is integrated with many other disciplines.

RADI 4202. General Diagnostic Radiology. 4 Credit Hours.

By being with the pediatric radiologist on a one-on-one basis through most of the working day, the student will have the opportunity to gain some insight as to the radiologist's role as a clinician, consultant, and teacher; and acquire some knowledge of general pediatrics, neonatology, urology, orthopaedics, and other specialties. The student may attend Diagnostic Radiology Lectures.

RADI 5001. Basic Radiation Safety. 1 Credit Hour.

This course provides the student with the opportunity to gain a conceptual understanding of the radiation protection principles involved in the research, diagnostic, and therapeutic uses of radiation sources. This course will cover the safe receipt, use, storage, and disposal of radiation sources in the biomedical research setting. The contents of this course fulfill HSC training requirements in order to use radioactive materials on campus. Successful participants will earn three HSC safety certificates of completion: Basic Radiation Safety Training, Basic Laser Safety Training, and Basic Laboratory Safety Training.

RADI 5005. Fundamentals Of Radiation Dosimetry. 3 Credit Hours.

The aim of this course is to introduce the students to the fundamentals of radiation dosimetry, including dosimetry quantities, interactions with matter, cavity theory and calibration protocols. More specifically, the topics that will be covered during this course are the following: 1) Introduction/Ionizing Radiation, 2) Quantities for describing interactions, 3) Exponential attenuation, 4) Charged particle and radiation equilibria, 5) Absorbed dose in radioactive media, 6) Radioactive decay, 7) X-ray interactions with matter, 8) Charged particle interactions with matter, 9) Cavity theory, 10) Dosimetry Fundamentals, and 11) Calibration protocols.

RADI 5007. Statistics in the Radiological Sciences. 2 Credit Hours.

An overview of biomedical statistics methods and basic applications to experimental design with special emphasis given to those methods used in radiation detection, image analysis, and evaluations of diagnostic efficacy. Students will learn the theory behind these methods and apply them to actual and simulated problems in the Radiological Sciences using the R statistical programming environment.

RADI 5010. Medical Biophysics. 3 Credit Hours.

This course is an introduction to the basic principles of biophysics as applied to medicine and biology. Emphasis will be placed on non-imaging topics of medical biophysics such as mechanics, thermodynamics, diffusion, electrical conduction, biomagnetism, and light spectroscopy.

RADI 5011. Radiation And Nuclear Physics. 3 Credit Hours.

This course reviews nuclear structure, interactions of radiation with matter, and the statistical nature of radiation. The course covers gas, scintillation, and solid-state detector technologies and their applications, including spectroscopy.

RADI 5015. Physics Of Diagnostic Imaging 1. 3 Credit Hours.

This course introduces the student to the basic principles and radiological practice using noninvasive imaging systems. Topics include production of x-rays, interaction of radiation with matter, and the physics of imaging using computed tomography, ultrasound, and magnetic resonance. Prerequisites: consent of instructor.

RADI 5018. Physics Measurements In Imaging Lab. 2 Credit Hours.

This is a laboratory course focusing on performance of measurements used in quality assurance (QA), system characterization, and acceptance testing of medical imagers. Corequisites: RADI 5015.

RADI 5020. Principles of Health Physics 1. 3 Credit Hours.

This course covers the basic principles of protection dealing with the major forms of ionizing radiation.

RADI 5025. Molecular Oncology & Radiobiology. 1.5-3 Credit Hours.

This course is an overview of the physics and chemistry of radiation biology; the biological effects of ionizing and non-ionizing radiations and hyperthermia at the cellular and tissue levels and whole body and late effects.

RADI 5030. Neuroscience Imaging Laboratory. 1 Credit Hour.

Students are assigned to rotate in 6 laboratories at the RIC: MRI, PET, TMS, ERP, animal imaging, and optical imaging. In each lab, students will have the opportunity for hands-on experience on subject preparation, data acquisition, and processing.

RADI 5050. Human Neuroelectrophysiology. 3 Credit Hours.

A detailed study of the electrophysiological basis of human behavior, with an emphasis on event-related brain potentials associated with cognitive function, perception, and action. See instructor for prerequisite coursework.

RADI 5090. Radiological Sciences Seminar. 1-9 Credit Hours.

Enrolled students are required to attend a minimum of 9 faculty/outside speaker seminars per semester and complete an evaluation sheet on each seminar attended. To fulfill the number of seminars, students may include seminars offered by disciplines other than their own. A list of seminars of interest to the students will be supplied on the first class day. Students must also prepare a PowerPoint presentation on a Radiological Sciences topic and present their seminar for critique by program faculty and students. By the end of this course, each student should be able to: 1) Demonstrate competence in verbal communication. 2) Demonstrate competence in written communication. 3) Critically review research literature and analyze scientific data.

RADI 6012. Phys Nuclear Medi Imaging. 3 Credit Hours.

This course is a study of physical principles of planar, SPECT, and PET radionuclide imaging; instrument theory; dosimetry; computer uses; and safety considerations.

RADI 6014. Physics Of Dental Imaging. 2 Credit Hours.

This course is a survey of imaging procedures used in modern dentistry with an emphasis on the clinical objectives and physical principles underlying intraoral, panoramic, cephalometric, and digital dental radiography. Prerequisites: consent of instructor.

RADI 6015. Physics Measurements in Imaging 2. 3 Credit Hours.

Students will study and work with advanced methods for evaluating the performance of clinical imaging systems, including x-ray imaging, fluoroscopy, mammography, ultrasound, x-ray CT and MRI. Testing will follow procedures described in publications of the AAPM and ACR and used to achieve compliance with the regulations and recommendations the DSA, MQSA, ACR, NRC, MIPPA and State of Texas' Radiation Control Program. Students will study the procedures and then use "best practices" to perform the tests in a clinical setting. Methods for evaluating nuclear medicine equipment shall also be reviewed and carried out, but in a less intensive manner. Prerequisites: RADI 5015, RADI 6049, RADI 6012 and RADI 6016.

RADI 6016. Physics of Diagnostic Imaging 2. 3 Credit Hours.

This course includes theory and applications of various forms of electronic imaging systems; advanced diagnostic imaging principles involving mathematical image analysis, digital image processing, digital image display, and concepts of electronic imaging. Prerequisites: consent of instructor.

RADI 6017. Neuroimaging Methods. 3 Credit Hours.

This course will deal extensively with several noninvasive brain imaging techniques to study the functional organization of the human and animal brains. Methods covered include positron-emission tomography (PET), event-related potentials, magneto-encephalography, optical imaging, voltage and calcium imaging, autoradiography, as well as transcranial magnetic stimulation. The course will only touch upon anatomical and functional MRI as well as high field MRI, as students will receive exhaustive MRI training from other classes. Course format will include both lectures on the several methods and seminars in which recent technical advances in the field are discussed. Prerequisites: consent of instructor.

RADI 6018. Foundations Of Neuroscience Imaging. 3 Credit Hours.

This course will explore several advanced topics in cognitive neuroimaging techniques. Examples of such topics include strategies to study the functional and/or anatomical organization of the human brain and paradigms used for studying a variety of brain functions. Students interested in functional MRI as well as DTI will have an opportunity to gain extensive knowledge and experience.

RADI 6020. Advanced Topics In Cognitive Neuroscience. 3 Credit Hours.

This course will explore several advanced topics in cognitive neuroscience. It includes exhaustive study of a brain function in normal and in disease states. Brain functions include but are not limited to sensation, perception, action, language, motion, and cognition.

RADI 6021. Prin/Health Physics 2. 3 Credit Hours.**RADI 6022. Programming for Medical Physics. 1 Credit Hour.**

The purpose of the course is to demonstrate to students the usefulness of programming for medical physics. The Matlab programming language is chosen because it enables rapid coding and data visualization. Students will first be taught basic programming techniques. Then, they will be shown specific examples of these techniques being applied to medical physics. Finally, they will create a final program, which performs a task of the student's choosing and utilizes several concepts from the course. Students will be graded based on their attendance and programming projects. Must have familiarity with the field of medical physics.

RADI 6023. Introduction To Clinical Medical Physics Practice. 1-9 Credit Hours.

This course allows students to observe professional medical physicists in a clinical setting and learn the roles of various other medical professionals in the Radiology and Radiation Oncology medical clinic. Students participate in simple tasks related to medical physics data and are shown how to evaluate data to provide reports and tables. Students are also trained in basic safety and ethical issues in clinical medicine and the professional conduct of the medical physicist, following the guidelines established in AAPM Report 109. This material is intended to cover ethical issues in clinical medicine and in the professional conduct of the medical physicist. The term ethics is used here in the sense of a permissible standard of conduct for members of profession. While different people may have different opinions of what is ethical professions always have certain ethical standards or codes of conduct that are compiled in written form and are generally by practitioners. In addition to becoming familiar with written codes of conduct, the student shall be introduced to commonly encountered situations in which a choice of actions is available, some of which would be considered unethical and some of which be considered ethical, according to current standards of care of practice. These would include more specific issues that arise with respect to recent patient privacy concerns and legislation specific to the Health Insurance Portability and Accountability Act (HIPAA) and compliance both in clinical practice and research. A case-based approach in a seminar setting with class participation is utilized. This allows the student to put him or herself in the place of an individual who faces an ethical dilemma and to explore variations of the case that is presented. Other faculty members are also encouraged to attend, to offer comments, and to relate situations that they encountered either first- or secondhand.

RADI 6024. Radiological Anatomy & Physiology. 3 Credit Hours.

This course will provide students with an opportunity to learn anatomy, physiology, and commonly used medical terminology as it relates to radiologic imaging. Anatomic and physiologic features will be illustrated with radiologic images in formats commonly encountered in clinical radiology. By the end of the course, students are expected to be familiar with basic medical terminology and have a good understanding of medical anatomy, physiology, and some basic pathology as related to specific organs for which radiologic images are commonly applied.

RADI 6025. Therapy Clinical Rotation 1. 10-12 Credit Hours.

The first clinical rotation is designed to give an introduction and an overview of all the clinical processes and the basic safety training. In detail the student will cover the following topics: employee orientation, radiation oncology orientation, HIPAA training, introduction to radiation protection, introduction to nursing and introduction to simulation, introduction to LINACs, LINAC QA and warm up, monitor unit calculations, electronic medical records orientation, regulations and professional recommendations.

RADI 6026. Clinical Therapy Rotation 2. 10-12 Credit Hours.

In the second semester of the clinical rotation, the students will cover the following topics: on board MV and kV imaging, ExacTrac design, function and daily, monthly QA, Linac Annual QA and the RPC process, TBI and TSE, IMRT planning, LDR planning and the COMS eye plaque process, patient safety, and learn shielding techniques for CT, kV imaging, LINAC and isotopes.

RADI 6027. Imaging Physics Clinical Rotation 1. 10-12 Credit Hours.

The first clinical rotation is designed to give an introduction and an overview of all the clinical processes and the basic safety training. In detail the student will cover the following topics: employee orientation, clinical radiology department orientation, HIPAA & MIPPA training, introduction to safety in the radiology clinic, introduction to general radiography, introduction to hard copy devices and image displays, electronic medical records orientation, introduction to ultrasounds imaging, introduction to mammography, regulations and professional recommendations.

RADI 6030. Physics Of Radiotherapy. 3 Credit Hours.

Theory, design, and operation of radiation-producing equipment used in radiation therapy are introduced. Exposure and absorbed dose calculations, patient dosimetry, treatment planning, and use of computers in radiation therapy are covered.

RADI 6031. Physics Measurements In Radiotherapy I. 3 Credit Hours.

Performance of measurements on radiation therapy equipment used to determine therapy treatment parameters is the opportunity for study in this course.

RADI 6032. Therapy Clinical Rotation 3. 10-12 Credit Hours.

In the third semester of the clinical rotation, the students will cover the following topics: treatment plan checks, weekly chart checks, brachytherapy planning and QA, LINAC design, SRS Treatment Planning (SRS) and daily, monthly and annual QA, participation in all aspects of SBRT treatment and treatment planning QA.

RADI 6033. Advanced Radiotherapy Physics. 3 Credit Hours.

This course includes the coverage of advanced radiation therapy special topics: intensity modulated radiation therapy, advanced brachytherapy, and radiation therapy shielding.

RADI 6034. Therapy Clinical Rotation 4. 10-12 Credit Hours.

In the fourth semester of the clinical rotation, the students will cover the following topics: medical dosimetry rotation, ultrasound, PET, MRI, SPECT imaging in radiotherapy and acceptance and commissioning of major equipment.

RADI 6035. Physics Measurements In Radiotherapy 2. 3 Credit Hours.

In this course students will have the opportunity to gain further didactic and hands-on familiarity with radiation therapy measurement equipment (ion chambers, films, TLDs, water tanks, profilers, etc.) and learn daily clinical practices. Students will have the opportunity to learn the roles of a radiation oncology team, the generation of radiation therapy treatment plans, patient quality assurance, and advanced, specialized radiation therapy techniques. Learning can be accomplished through attendance of didactic lectures, homework assignments, presentations of class projects, and a comprehensive oral exam. Prerequisites: RADI 5005, RADI 6030, and RADI 6031.

RADI 6038. Methods in Dosimetry & Shielding Design. 2.5 Credit Hours.

The goal of the course is to teach students the guidelines established by the American Association of Physicists in Medicine (AAPM) and the National Council of Radiation Protection (NCRP) relating to patient dosimetry and shielding design of radiological facilities. Students will be responsible to read, comprehend, and learn the selected Task Group reports. Students will be evaluated of their knowledge by weekly quizzes and a final oral evaluation held at the end of the course. Successful completion of the course will be accomplished when the student is knowledgeable and understands the recommendations for a practicing clinical physicist. Learning is accomplished through attendance of weekly lectures, assignments (presentation of assigned reports and guidelines), and class discussion.

RADI 6039. Imaging Physics Clinical Rotation 2. 10-12 Credit Hours.

In the second semester of the clinical rotation, topics covered include safety in the radiological clinic, nuclear medicine and MRI, introduction to fluoroscopy, computed tomography, magnetic resonance imaging, nuclear medicine and regulations, professionalism and ethics.

RADI 6040. Imaging Physics Clinical Rotation 3. 10-12 Credit Hours.

The third clinical rotation will include safety in radiology clinic, advanced general radiography, advanced breast imaging and image-guided stereotactic breast biopsy, dental radiography and cone beam CT, dual-energy x-ray absorptiometry (DEXA), advanced fluoroscopic imaging and special procedures, intermediate nuclear medicine and regulations, professionalism and ethics.

RADI 6042. Non-Ionizing Radiation Biology. 1-9 Credit Hours.

This course is an overview of the biological and known or potential health effects of non-ionizing radiation, with attention to radio frequency radiation in the microwave range, extremely low frequency (ELF) field exposures, LASER emissions, and ultraviolet (UV) light exposure.

RADI 6043. Imaging Physics Clinical Rotation 4. 10-12 Credit Hours.

The fourth clinical rotation will include safety in radiology clinic, imaging informatics, advanced imaging informatics, advanced magnetic resonance imaging, advanced nuclear medicine physics, regulations, professionalism and ethics.

RADI 6049. Intro To Magnetic Resonance. 2 Credit Hours.

This course presents the basics of the practice of magnetic resonance as the experimentalist or clinician first meets them. The approach begins with images, equipment, and scanning protocols. The student will have the opportunity to face issues pertinent to practice with theoretical background added as experience grows. Through this approach, key ideas are introduced in an intuitive style that is faithful to the underlying physics.

RADI 6050. Magnetic Resonance Imaging. 2 Credit Hours.

This course explores the physics of magnetic resonance image formation through discussion of imaging problems, reviews of current research topics with an emphasis on quantitative methods using MRI, and hands-on experience in MRI laboratories. Prerequisites: RADI 6049.

RADI 6051. Statistical Parametric Mapping. 3 Credit Hours.

Course content includes principles of NMR Spectroscopy as applied to the resolution of molecular structural problems in chemistry, biology, and medicine; and principles and methods for designing BOLD contrast MRI experiments and evaluating fMRI data.

RADI 6054. Introduction to Statistical Learning. 2 Credit Hours.

Machine learning and artificial intelligence (AI) are becoming increasingly common tools for image data analysis and image interpretation. AI methods are also being developed for treatment planning. This short, intensive course is designed to give the student an introduction to the principal methods of statistical learning that underlie artificial intelligence algorithms. Students will learn how to use the R statistical programming language to work through statistical learning exercises both in-class and in homework assignments. Course will be taught 2 hours per day for 3 days per week in July and August. Topics covered will include, Classification Schemes, Resampling Methods, Linear Model Selection and Regularization, Tree-Based Methods, Support Vector Machines, and Unsupervised Learning. Prerequisites: Completion of RADI 5007, Statistics in the Radiological Sciences; Familiarity with R statistical programming environment. Open for Cross Enrollment on Space Available Basis.

RADI 6060. Biophotonics and Optical Imaging. 3 Credit Hours.

Optical methodologies for imaging, diagnosis, and therapy are rapidly advancing in biology and medicine. This course will review basic elements of optics and optical sources, especially lasers and light-emitting solid state devices, in the context of biomedical applications. Dosimetry, tissue optics, and the principles of laser-tissue interaction will be considered in depth. Current medical uses of lasers will be surveyed, along with their scientific and technical foundations. The course will conclude with several case studies of research areas that are currently hot topics in biomedical optics.

RADI 6062. Cognitive Neuroscience. 3 Credit Hours.

Cognitive Neuroscience deals with the neural basis of cognition and behavior, including considerations of perception, attention, motor control, language, learning, memory, executive function, spatial cognition, emotion, and social cognition. It also presents discussions on neurocognitive development and the evolution of the human brain. Unlike courses in basic neuroscience, this course has a more human focus, presenting in-depth discussions of neuroimaging techniques and literature. In addition, it focuses on psychological models of cognitive function derived from psychological experimentation, human lesion studies, and computational modeling. Cognitive Neuroscience presents an integrated view of the psychology and neurobiology of human cognition and behavior. By the end of the semester, students will have had the opportunity to: (1) become highly familiar with the structure of the human nervous system; (2) become conversant about the physical basis and limitations of neuroimaging techniques; (3) become familiar with the principal brain areas thought to be involved in a host of human cognitive competencies and behaviors, including perception, action, emotion, and language; and (4) understand how psychological theory and neural theory come together to form the foundation of cognitive neuroscience.

RADI 6071. Supervised Teaching. 1-12 Credit Hours.

This course is a presentation of lectures and supervised teaching under the direction of faculty.

RADI 6091. Special Topics. 1-12 Credit Hours.

This course covers topics of special interest which may include emerging and new modalities in radiological sciences relating to x-ray, nuclear, or magnetic imaging.

RADI 6097. Research. 1-12 Credit Hours.

This course is supervised research under the guidance of a faculty member.

RADI 6098. Thesis. 1-12 Credit Hours.

Registration for at least two terms is required for M.S. candidates. Prerequisites: admission to candidacy for the Master of Science degree.

RADI 7000. Off Campus. 4 Credit Hours.

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

RADI 7005. Treatment Planning Techniques In Radiation Therapy. 3 Credit Hours.

The goal of the course is to provide an overview of the physics and clinical elements that contribute to the development of computerized treatment plans in radiation therapy. The commissioning and acceptance testing of a planning system will be discussed and demonstrated in several planning platforms. Anatomy specific treatment planning will be described, including imaging of the specific disease, as well as contouring and plan development. Multiple plans will be generated for each site using different planning modalities, such as 2D, 3D, and IMRT.

RADI 7006. Treatment Planning Techniques in Radiotherapy 2. 3 Credit Hours.

This course is a continuation of RADI 7005. It presents an in-depth study of multidisciplinary treatment of the cancer patient from the clinician's viewpoint. Students are required to master concepts specific to site-specific disease including: histopathology, etiologic and epidemiology factors, detection and diagnosis, tumor stage and grade, routes of metastases, dose fractionation and prognostic factors. This course is designed to approach each cancer type by anatomic system, addressing treatment factors with increasing degrees of complexity. Assigned exercises organized by treatment site and procedure type will be carried out under the direct supervision of an assigned advisor. These will be both simulated and real case assignments. The course is taught as a didactic course with applied planning. Didactic instruction will be provided by medical residents while practical planning instruction will be applied by a medical dosimetrist.

RADI 7010. Motor Learning And Brain Imaging. 3 Credit Hours.

This course is designed for the advanced student (doctoral or postdoctoral) to obtain a comprehensive overview of the field of motor learning from behavioral and brain imaging perspectives. Topic coverage will include general motor learning and speech motor learning (with reference to treatment of motor speech disorders). The course will be structured in a seminar format. The course will explore measurement methods and issues in motor learning and the neural substrates of learning in intact and disordered subject groups.

RADI 7077. Ethics, Leadership and Vision. 2 Credit Hours.

This foundational course introduces students to the core ethical content necessary for responsible research conduct. It will also provide basic knowledge on negotiations, professionalism, leadership, effective communication, etc. Open for Cross Enrollment on Space Available Basis.

RADI 7099. Dissertation. 1-12 Credit Hours.

Registration for at least one term is required for Ph.D. candidates. Prerequisites: admission to candidacy for Doctor of Philosophy degree.

Courses

RADO 4000. Special Topic. 4 Credit Hours.

This is a self-designed course created by both the student and the department to cover a specific topic. A Course Approval Form must be completed along with documentation of the designed course description.

RADO 4003. Clinical Radiation Medicine. 4 Credit Hours.

Participation in daily operations at the Mays Cancer Center includes treatment planning conferences, simulation, computer planning, applied physics, treatment setups, etc. Assistance is provided in consultations, follow-up clinics, and inter-departmental activities and ongoing projects. Emphasis is on radiation oncology. Responsibility is given according to capability and interest.

RADO 7000. Radiation Oncology Off-Campus. 4 Credit Hours.

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

Courses**REHB 4000. Special Topic. 4 Credit Hours.**

Special topic course/research rotation by permission only.

REHB 4001. Clinical Rehabilitation Medicine. 4 Credit Hours.

The student will participate in patient care activities and limited exposure to electrodiagnostic procedures under the direct supervision of faculty and residents. The student will have exposure to Rehabilitation Medicine from an outpatient and consultative perspective and will attend teaching conferences, lectures, rounds, etc. (University Hospital and/or VA Hospital). No late drops will be accepted.

REHB 4002. Introductory Inpatient Rehabilitation. 4 Credit Hours.

The course will provide in-depth exposure to inpatient rehabilitation and the major rehabilitation areas. The course will include experience in diagnosis and comprehensive rehabilitation management of inpatients with strokes, spinal cord injuries, neurologic disorders, rheumatoid arthritis, amputations, chronic pain, and other major disabling conditions. The student must attend teaching conferences, lectures, and rounds. Comprehensive work-ups and close follow-up of patients will be required (University Hospital). No late drops will be accepted.

REHB 4005. Combined Rehabilitation. 4 Credit Hours.

This course will provide the student with a good overview of the specialty of PM&R allowing faculty/resident-supervised participation in patient care activities related to Rehabilitation Medicine consultations, Inpatient Rehabilitation and limited exposure to electrodiagnostic procedures. Student will also attend teaching conferences, clinics, lectures, rounds, etc. No late drops will be accepted.

REHB 4006. Intro Spinal Cord Injury. 4 Credit Hours.

This rotation will provide the student with the opportunity to actively participate in the management of patients who have sustained a spinal cord injury. Working in a state-of-the-art spinal cord injury facility, students will help treat patients in virtually all aspects of their injury, from acute care, to rehabilitation evaluation and treatment, to eventual discharge and outpatient follow-up. Students will become an integral part of an interdisciplinary team under the supervision of faculty and residents (VA Hospital and/or University Hospital). No late drops will be accepted.

REHB 4009. Polytrauma. 4 Credit Hours.

This course will provide in-depth exposure to the inpatient rehabilitation of patients with trauma to more than one major organ system (e.g. burns, traumatic brain injury, amputations, spinal injuries, pulmonary, etc.). The course will include experience in diagnosis and comprehensive rehabilitation management of inpatients with the trauma to the above systems, as well as the management of co-morbidities (e.g. PTSD, depression, strokes, spinal cord injuries, chronic pain) and complications of those injuries. The student must attend teaching conferences, lectures, and rounds. Comprehensive work-ups and close follow-up of patients will be required (VA Hospital).

REHB 7000. Off Campus. 4 Credit Hours.

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

Courses**SURG 3005. Surgery Clerkship. 8 Credit Hours.**

The eight-week core surgery clerkship is divided into a four-week general surgery rotation and a four-week surgery specialty rotation. The goals of the third-year surgical curriculum are divided into 5 broad categories: 1. Preparation of the medical student for patient care/clinical skills, including a. performance of a focused history and physical examination on a surgical patient, b. interpretation of diagnostic tests and procedures for the surgical patient, c. performance of basic technical skills, d. demonstration of clinical reasoning and problem-solving skills for the surgical patient, e. formulation of a diagnostic and therapeutic plan for a surgical patient; 2. Increase fund of medical knowledge for a surgical patient, 3. Self-directed learning, 4. Application of best evidence-based practices to improve patient care and to prepare for daily activities, and 5. Development of interpersonal and communication skills, including: a. oral presentations to the surgical team, b. written notes in the medical record, c. relationship with patients and their families, d. relationship with the healthcare team, e. practice of professionalism in all settings. In order to achieve these goals, the student should have a sound knowledge of surgical anatomy and the pathophysiology of surgical illness. The student should have strong understanding of the patient's surgical disease process. The student should master simple basic technical skills by the end of the clerkship. The student should master a focused history and physical examination on a surgical patient. The student should propose and interpret diagnostic tests and procedures that are appropriate for the surgical disease. The student should develop a differential diagnosis and demonstrate clinical reasoning and problem-solving skills that integrate clinical data. The student should develop a logical diagnostic and therapeutic plan for surgical problems. The student should develop strong interpersonal relationships and communication skills with patients, their families and the healthcare team. The student should be well read and well prepared for operations and rounds, and begin to develop good habits for self-directed, lifelong learning. The student should demonstrate an understanding of best practices that improve the health of surgical patients. The student should provide competent, compassionate care for patients in all surgical settings.

SURG 4000. Special Topic. 4 Credit Hours.

This is a self-designed course created by both the student and the department to cover a specific topic. A Course Approval Form must be completed along with documentation of the designed course description.

SURG 4002. Surgical Oncology. 4 Credit Hours.

Senior students must function as "interns" on the surgical oncology service. They admit and discharge surgical oncology patients. They perform history and physical examinations, and keep daily records on surgical oncology patients. They follow patients in the outpatient clinics, in the emergency department, in the intensive care units and on general wards. They participate in operations for their patients. They participate in pre- and post-operative care of surgical oncology patients. They present cases, attend all conferences, and take call as designated by the surgical oncology service. They mentor third-year medical students on the surgical oncology service. They may participate in basic science research projects in the surgical oncology laboratory and in ongoing clinical trials of cancer diagnosis and management.

SURG 4012. Oral Maxillofacial Surgery. 4 Credit Hours.

Senior students function as "interns" on the oral maxillofacial surgery service. They admit and discharge oral maxillofacial patients. They perform history and physical examinations, and keep daily records on oral maxillofacial patients. They follow patients in the outpatient clinics, in the emergency department, in the intensive care units, and on general wards. They participate in operations for their patients. They participate in pre- and post-operative care of oral maxillofacial issues including outpatient sedation and anesthesia, dentoalveolar surgery, facial fractures, facial aesthetic and reconstructive surgery, management of facial and dental pain, and management of facial infections.

SURG 4026. Plastic Surgery Selective. 4 Credit Hours.

Senior students function as "interns" on the plastic surgery service. They admit and discharge plastic surgery patients. They perform history and physical examinations, and keep daily records on plastic surgery patients. They follow patients in the outpatient clinics, in the emergency department, in the intensive care units, and on general wards. They participate in operations for their patients. They participate in pre- and post-operative care of plastic surgery patients. They present cases, attend all conferences, and take call as designated by the plastic surgery service. They mentor third-year medical students on the plastic surgery service. They have exposure to a wide range of plastic surgery issues including complex wound management, aesthetic plastic surgery, facial fractures, reconstructive surgery of the head and neck, and breast, hand, and extremity.

SURG 4031. Transplant Surgery Selective. 4 Credit Hours.

Senior students function as "interns" on the transplant surgery service. They admit and discharge transplant patients. They perform history and physical examinations, and keep daily records on transplant patients. They follow patients in the outpatient clinics, in the emergency department, in the intensive care units, and on general wards. They participate actively in live renal and liver donor evaluation. They participate in operations for their patients, including liver resection and renal, pancreas, and liver transplants. They participate in the evaluation and procurement of the multiorgan cadaveric donor. They participate in pre- and post-operative care of transplant patients. They present cases, attend all conferences, and take call as designated by the transplant service. They present patients at formal multidisciplinary transplant rounds daily. They mentor third-year medical students on the transplant service. They have much contact with gastroenterologists and nephrologists who care for patients on the transplant service. The students rotate at University Hospital and Santa Rosa Northwest Medical Center.

SURG 4037. Pediatric Surgery Selective. 4 Credit Hours.

Senior students function as "interns" under private practice pediatric surgeons who are clinical faculty at the Health Science Center. They admit and discharge pediatric surgery patients. They perform history and physical examinations, and keep daily records on pediatric surgery patients. They follow patients in the outpatient clinics, in the emergency department, in the intensive care units, and on general wards. They participate in operations for their patients. They participate in pre- and post-operative care of pediatric surgery patients. They present cases, attend all conferences, and take call as designated by the pediatric surgery service. They mentor third-year medical students on the pediatric surgery service. This rotation is intended for students who seek a career in pediatric surgery or primary care pediatrics. Opportunities for clinical research projects are available. The students rotate at Santa Rosa Children's Hospital.

SURG 4038. Rural Surgery Elective. 4 Credit Hours.

In this rotation, senior students work with a private practice general surgeon in a rural setting. Senior students function as a "junior partners" on this general surgery service. They admit and discharge general surgery patients. They perform history and physical examinations, and keep daily records on general surgery patients. They follow patients in the outpatient clinics, in the emergency department, in the intensive care units, and on general wards. They participate in operations for their patients. They participate in pre- and post-operative care of general surgery patients. They take call as designated by the surgeon. The objectives of this rotation are: to introduce students to the socioeconomic problems that rural patients face with access to care, to discover how the internet and distance learning decrease isolation in rural communities, to encourage students to consider surgical practice in underserved rural communities. Housing for the student will be provided during the rotation.

SURG 4040. Surgical Critical Care Selective. 4 Credit Hours.

This course provides senior students with a broad exposure to surgical critical care. Students rotate through the surgical trauma ICU and have the opportunity to gain a great understanding of the principles and practice of surgical critical care. The student will have good exposure to cardiovascular and pulmonary physiology. They will have the opportunity to learn about modern concepts of resuscitation, ventilator management, vasopressor support, nutritional support, and infection control. They will have opportunity to place central lines, PA catheters, arterial lines, and perform intubation and bronchoscopy. They will have opportunity to examine and manage critically ill and injured patients in the ICU and keep medical records daily. They will have opportunity to present patients on formal rounds daily and participate in didactic critical care conference and trauma morbidity and mortality conference. They will have opportunity to take call as designated by the service.

SURG 4042. General Surgery (UH). 4 Credit Hours.

Students will participate in the care of patients with common general surgical outpatient diagnoses. Students in a supervised setting will evaluate patients in the outpatient general surgery clinics at UT Health San Antonio and University Health System clinics. Students will participate in a high volume of outpatient surgeries both in the hospital setting and the surgery center settings. Students in a supervised setting will check in patients for their surgeries, participate in the operations, and participate in the safe transition of patients from the operating room to the post-anesthesia care unit. Students will evaluate post-op patients in clinic, going over pathology results, removing sutures or staples, and participating in the post-op continuity of care of patients who have undergone elective surgeries.

SURG 4043. General Surgery (Minimally Invasive Surgery- MIS). 4 Credit Hours.

Students function as "interns" on this broad-based general and laparoscopic surgery service. They admit and discharge general surgical patients. They perform history and physical examinations, and keep daily records on general surgical patients. They follow general surgical patients in the outpatient clinics, in the emergency department, in the intensive care units, and on general wards. They participate in operations for their patients. They participate in pre- and post-operative care of general surgical patients. They present cases, attend all conferences, and take call as designated by the general surgical service.

SURG 4044. General Surgery VA. 4 Credit Hours.

Senior students function as "interns" on this broad-based general surgery VA service. They admit and discharge general surgical VA patients. They perform history and physical examinations, and keep daily records on general surgical VA patients. They follow general surgical VA patients in the outpatient clinics, in the emergency department, in the intensive care units, and on general wards. They participate in operations for their patients. They participate in pre- and post-operative care of general surgical VA patients. They present cases, attend all conferences, and take call as designated by the service. They mentor third-year medical students on the general surgical VA service.

SURG 4047. Trauma. 4 Credit Hours.

Students will participate in the evaluation and management of Trauma Patients. They will perform the primary, secondary, and tertiary survey of trauma patient. They will document their history and physical exam findings in the medical record. They will participate in bedside procedures and operative procedures in trauma surgical patients. They will participate in the care of trauma patients in the Trauma follow up clinic. They will present cases, attend trauma morning report and weekly conferences, and take call as designated by the service. Prerequisites: Must have completed Core Surgery Clerkship First.

SURG 4048. Vascular Surgery University Hospital/VA Hospital. 4 Credit Hours.

Senior students function as "interns" on each vascular surgery UH/VA service. They admit and discharge vascular surgery UH/VA patients. They perform history and physical examinations, and keep daily records on vascular surgery UH/VA patients. They follow vascular surgery UH/VA patients in the outpatient clinics, in the emergency department, in the intensive care units, and on general wards. They participate in operations for their patients. They participate in pre- and post-operative care of vascular surgery UH/VA patients. They present cases, attend all conferences, and take call as designated by the service. They mentor third-year medical students on the vascular surgery UH/VA service. Students have the opportunity to learn to perform a complete vascular physical examination and learn to interpret vascular diagnostic studies. They will have the opportunity to learn the finer details of endovascular treatment of vascular diseases.

SURG 4049. Surgical Internship Readiness. 4 Credit Hours.

The purpose of this elective is to prepare senior medical students who are interested in a surgical career for their surgery internship. This elective is a surgical "boot camp" to provide practical "hands on" experience for students. General Surgery Subinternship is required prior to taking this course.

SURG 4058. Emergency General Surgery Service. 4 Credit Hours.

Senior students must function as "interns" on the Emergency General Surgery Service at University Hospital. They admit and discharge surgery patients with common urgent/emergent diagnoses. They perform history and physical examinations, and keep daily records on patients. They follow patients in the outpatient clinics, in the emergency department, in the intensive care units and on general wards. They participate in operations for their patients. They participate in pre- and post-operative care of the emergency general surgery patients. They present cases, attend all conferences, and take call as designated by the surgery service. This service line at University Hospital cares for patients with common surgical diagnoses such as appendicitis, cholecystitis, abscesses, necrotizing infections, bowel obstructions, perforated viscera, acute abdomens along with any other surgical consultations commonly cared for by surgeons.

SURG 4400. Colorectal Surgery. 4 Credit Hours.

Senior students must function as "interns" on the colorectal service. They admit and discharge colorectal surgery patients. They perform history and physical examinations, and keep daily records on colorectal surgery patients. They follow patients in the outpatient clinics, in the emergency department, in the intensive care units and on general wards. They participate in operations for their patients. They participate in pre- and post-operative care of colorectal surgery patients. They present cases, attend all conferences, and take call as designated by the colorectal surgery service.

SURG 7000. Off Campus. 4 Credit Hours.

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

Courses**UROL 4000. Special Topic. 4 Credit Hours.**

Students will work with faculty in the design, preparation for and execution of basic science or clinical research projects. Translational research studies may be available and are encouraged. Some projects will require that funding or IRB approval be obtained prior to initiation so students are encouraged to discuss their proposed projects well in advance with the appropriate faculty. Participation in some existing projects with faculty that are already in progress may be possible as well.

UROL 4027. Urology Selective. 4 Credit Hours.

Senior students are required to function as "interns" on the Urology service; perform history and physical examinations; keep daily records on urology patients; follow patients in the outpatient clinics, in the emergency department, in the intensive care units, and on general wards; participate in operations for their patients and in pre- and post-operative care of urology patients; present cases, attend all conferences, and take call as designated by the urology service; mentor third-year medical students on the urology service; and present one 10- to 15-minute lecture on a urologic topic of their choice. They are encouraged to participate in basic and clinical science research projects with urology faculty.

UROL 7000. Off Campus. 4 Credit Hours.

Senior students are required to function as "interns" on the Urology service; perform history and physical examinations; keep daily records on urology patients; follow patients in the outpatient clinics, in the emergency department, in the intensive care units, and on general wards; participate in operations for their patients and in pre- and post-operative care of urology patients; present cases, attend all conferences, and take call as designated by the urology service; mentor third-year medical students on the urology service; and present one 10- to 15-minute lecture on a urologic topic of their choice. They are encouraged to participate in basic and clinical science research projects with urology faculty.