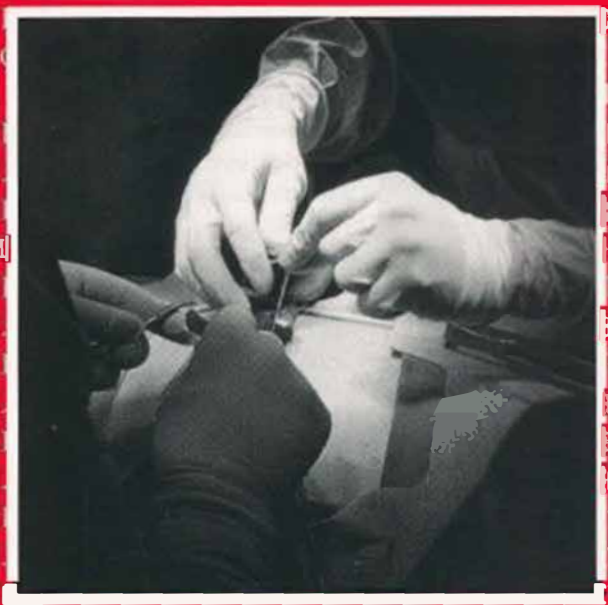
TEXAS TECH UNIVERSITY HEALTH SCIENCES CENTER



SCHOOL OF MEDICINE CATALOG

1998-2000

TEXAS TECH UNIVERSITY HEALTH SCIENCES CENTER

School of Medicine

Catalog

1998-2000

The provisions of this catalog do not constitute a contract, express or implied, between any applicant, student, or faculty member and the Texas Tech University Health Sciences Center School of Medicine, including any of the institution's regional campuses. The Texas Tech University Health Sciences Center School of Medicine reserves the right to change or withdraw courses at any time. It also may change fees, calendar, curriculum, graduation procedures, and any other requirement affecting students. Changes will become effective whenever the proper authorities so determine and will apply to both prospective students and those already enrolled.

STATEMENT OF EQUAL OPPORTUNITY

The School of Medicine is committed to a policy of equal opportunity. The School of Medicine will not discriminate on the basis of race, color, sex, age, religion, sexual orientation, national origin or physical handicap.

All inquiries and correspondence concerning admission to the School of Medicine should be addressed to:

Office of Admissions School of Medicine Texas Tech University Health Sciences Center 3601 4th Street Lubbock, TX 79430-0001

Phone: (806) 743-2297 - Admissions or (806) 743-3005 - Student Affairs

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TEXAS TECH UNIVERSITY HEALTH SCIENCES CENTER

SCHOOL OF MEDICINE

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MISSION

The mission of the School of Medicine is the provision of quality medical education. This effort in each of its four geographically separated campuses encompasses undergraduate, graduate, and continuing medical education and graduate studies. The emphasis is on primary care as well as highly specialized care and is enriched by the conduct of relevant biomedical investigation and other scholarly pursuits. The School of Medicine has developed supplemental mission statements for the centers at Amarillo, El Paso, Lubbock and Odessa in order to define the unique role of each campus within the several goals of the institution. The individual mission statements provide the basis for the development plan for each campus.

The development and operation of the overall academic program of the school and its regional conduct on four separate campuses is in strict compliance with the Liaison Committee on Medical Education (LCME) standards for accreditation of medical schools with geographically separate campuses. Each campus provides for an appropriate subset of each of the seven programatic responsibilities of any School of Medicine: undergraduate medical education, residency training, continuing medical education, biomedical graduate education, research, patient care, and community service.

BACKGROUND INFORMATION

The Texas Tech University Health Sciences Center School of Medicine was created by the Texas Legislature in May, 1969, as a multi-campus regional institution with Lubbock as the administrative center and with other regional campuses at Amarillo, El Paso, and Odessa. The lack of a single focus of population density dictated the regionalization of medical education in West Texas, which comprises 48% of the land mass of the state and encompasses 20% of its population. The School of Medicine is one of five schools in the Health Sciences Center, the other four being the Schools of Nursing, Allied Health, Pharmacy, and the Graduate School of Biomedical Sciences. All five schools are committed to regionalized, multi-campus educational experiences.

The School of Medicine formally opened in August of 1972 with a freshman class of 36 and a junior class of 25 students. From 1980 to 1994 the school accepted 100 first year students for a total of 400 in the student body. In 1993, class size was increased by the Texas State Legislature to 120 in each first year class beginning with the class entering in the fall of 1994. Primary consideration is given to residents of Texas and the contiguous counties of New Mexico and western Oklahoma. Other out-of-state applicants may be considered on an individual basis if they have outstanding academic credentials.

The school has as its major objectives the provision of quality medical education and the development of programs to meet appropriate health care needs of the 108 counties of West Texas. The school has a full time faculty of 588 with 186 part time faculty and 951 volunteer faculty.

All basic science courses are offered in the first two years on the Lubbock campus, contiguous with Texas Tech University. The recreational and cultural resources of the University are available to the medical students. For clinical studies, the class is divided with approximately 30 to 35 students in Amarillo, 35 to 40 students in Lubbock, and 50 to 55 students in El Paso. The campus at Odessa provides only graduate training and certain undergraduate elective experiences.

Assignments to the regional campuses are based to the extent possible on expressions of student preference obtained prior to entry into the first year. There is a possibility for change in assignment for due cause. At the beginning of the freshman year, there is an active orientation program which includes a day spent with students at the respective regional campuses to which each student has been assigned.

At each regional center, clinical students in their third year rotate through the basic clinical clerkships in Internal Medicine, Surgery, Obstetrics/Gynecology, Psychiatry, Pediatrics, and Family Medicine. The students are provided a diversity of experience in community hospitals and in the School of Medicine's own ambulatory clinics. In the senior year, students may take elective experiences at any of the regional campuses and other institutions.

Lubbock offers clinical experience at University Medical Center, City-County Health Department, Saint Mary of the Plains Hospital, Veterans Administration Outpatient Clinic, the Lubbock Regional MHMR Center, and the Montford Psychiatric Prison Hospital.

In Amarillo, clinical education is provided in area hospitals and health care facilities. These include Northwest Texas Hospital, Baptist St. Anthony Hospital, Don and Sybil Harrington Cancer Center, the Psychiatric Pavilion, and the Veterans Administration Hospital of Amarillo.

At El Paso, clinical sites are provided at R. E. Thomason General Hospital, William Beaumont U.S. Army Medical Center, Providence Hospital, and the El Paso Psychiatric Center.

In the Midland-Odessa area, clinical sites are Medical Center Hospital (Odessa) and Memorial Hospital (Midland).

The educational program at each regional center is comparable as indicated by the number and types of patients seen by students and by student performance on measures such as National Board examinations, oral examinations, departmental examinations, and clinical ratings by faculty.

In addition to the four year curriculum leading to the M.D. degree, the Texas Tech University Health Sciences Center School of Medicine provides graduate training to residents in fourteen disciplines across the four campuses. The School of Medicine graduate program also offers the Master of Science and Doctor of Philosophy degrees in five basic science areas. There is a formal M.D./Ph.D. program with stipend as well as the ability to pursue the two degrees in parallel in individually designed curricula.

A combined MD/MBA program is also available. Through this program, qualified students may complete both the MD and MBA degrees in four years.

THE ADMISSIONS PROCESS

General Philosophy

Texas Tech University Health Sciences Center School of Medicine invites applications from qualified residents of the state of Texas and the adjacent counties of eastern New Mexico and southwestern Oklahoma which comprise the service area of the Health Sciences Center. Other out-of-state residents will be considered on an individual basis if they have a grade point average higher than 3.6 and an MCAT score higher than 29. One hundred and twenty students are selected for each entering class. The Admissions Committee carefully examines each application for quality of academic record and for indications of those personal traits which make for the effective and competent physician. If all other qualifications are equal, some preference is given to West Texas residents. While evidence of high intellectual ability and a strong record of scholastic achievement are vital for success in the study of medicine, the Admissions Committee recognizes the essential role of compassion, motivation, maturity, personal integrity, and the ability to communicate effectively as traits of the consummate physician. Letters of reference from preprofessional advisors are also considered, and the ability to balance academic achievement with extracurricular and/or work activities is examined. Those applicants who appear to possess both the cognitive and non-cognitive traits which indicate likelihood of academic and professional success are invited for personal interview. There is no discrimination on basis of race, sex, age, ethnic origin, religion, sexual orientation or disability. The Committee examines each applicant for overall suitability, and it makes an effort to select a class of 120 persons with varied backgrounds, interests, and life experiences so that there is a stimulating and broadening learning environment for the medical curriculum.

Undergraduate Course Requirements

At least three years of study (90 semester hours or the equivalent in quarter hours) in an accredited United States or Canadian college or university is required. The completion of a baccalaureate degree, however, is highly desirable before entrance into medical school. Students applying without a baccalaureate degree are considered only if they have a significantly superior scholastic record and exhibit personal maturity.

Course work from non-U.S. or Canadian schools will be accepted only if it appears, with a grade, on the transcript of a U.S. or Canadian college or university as an individual course. "Lump sum" credit is not acceptable. All prerequisite courses for medical school must have been taken for credit at an accredited U.S. or Canadian college or university.

Specific course requirements have been kept at a minimum to allow and encourage the student to have a broad and well-rounded education. There are no specific requirements for undergraduate majors. The Admissions Committee reviews the academic challenge provided by course selection and gives preference to students with a broad educational background.

Required Courses

Biology or Zoology (with laboratory)	1 year
Upper Level Biology	1 year
Inorganic Chemistry (with laboratory)	1 year
Organic Chemistry (with laboratory)	1 year
Physics (with laboratory)	1 year
English	1 year

Proficiency in verbal and written communication is essential. A basic knowledge of conversational Spanish is desirable, but is not required. One year of mathematics, as well as a course work in statistics, is also desirable, but not required.

Medical College Admission Test (MCAT)

Completion of the Medical College Admission Test (MCAT) within five years of application is a requirement for admission. The Admissions Committee recommends that the test be taken in the spring of the year in which application will be made. Registration information may be obtained from:

The American College Testing Program
P.O. Box 414
Iowa City, IA 52240

Application Process

Applications will be available beginning April 1st of the year of application. Completed applications and all supporting documents must be postmarked by November 1st. Each application must be accompanied by an application fee of $40. In case of documented financial hardship, a student may request waiver of the application fee.

Each completed application will be reviewed by the Admissions Committee and personal interviews will be offered to those students deemed competitive for admission. All interviews are conducted at the Lubbock campus. On the day of interview, there is also an opportunity to tour the medical school, talk with students, and sit in on classes if desired.

After the interview, the Admissions Committee considers the applicant's overall academic record, grade trends, MCAT results, preprofessional recommendations, impressions of interviewers, and any other pertinent information. Acceptance letters are sent on the 15th of each month beginning in October. The majority of acceptance letters are sent on or after January 15th. The accepted student has two weeks in which to accept or decline the offer in writing.

A deposit of $100 is required in April if the student accepts. This amount is later applied to tuition, or may be refunded if the student withdraws prior to June 1. By June 1 of each year, each applicant will have received a decision regarding acceptance, status on waiting list, or rejection.

Application materials can be obtained by writing to:

Office of Medical School Admissions
Texas Tech University Health Sciences Center
School of Medicine
3601 4th Street
Lubbock, TX 79430-0001

Immunizations

As a condition of entry to medical school, each student must produce proof of immunization to tetanus and diphtheria within ten years of registration, to measles (roseola) within five years of registration, to mumps (if there is no history of mumps), to rubella (if there is not a demonstrated protective titre), and to hepatitis-B. If the hepatitis-B immunization series has been begun, it may be completed during the first year of medical school at the Student Health Service. Each matriculant must also have had a tuberculin skin test or chest x-ray within one year of registration.

Special Considerations

1. Early Decision Program (EDP)

The school does have a program whereby exceptionally well qualified students can receive a decision on their applications by October 1 in the year prior to matriculation. Applications from individuals requesting Early Decision must be completed by August 1, and interviews will be set up shortly thereafter. A person who applies for Early Decision commits to apply only to Texas Tech School of Medicine prior to October and commits to matriculate at Tech if the position is offered. Applicants will be notified of the Committee's decision on or before October 1. If an individual is not accepted under the Early Decision Program plan, that applicant will still be considered in the regular applicant pool at Tech and may also then apply to any other medical schools.

2. Deferment of Matriculation

Under extenuating circumstances, an applicant who has been accepted for enrollment in the fall may request, in writing, deferment until the following fall. Such request will be considered by the Dean of the Medical School and may be granted for a period not to exceed one year. During the year of deferment, the student may not make application to any other medical school.

3. Application for Admission in Advanced Standing

Applications for advanced standing are reviewed and considered on an individual basis. Texas residents enrolled in good standing in LCME - accredited schools are eligible to apply. Such applicants must have written permission from their Dean for Student Affairs for possible transfer; may be interviewed before acceptance; and must have taken Step I of the United States Medical Licensing Examination (USMLE-I) as conditions for acceptance in advanced standing. The student may be accepted to enter in July of the third year with the written understanding that failure to pass USMLE Step I will be handled as prescribed for all other Tech students (i.e. complete clerkship which has been begun and then withdraw from curriculum to prepare for the next administration of Step I).

Under very exceptional circumstances, applicants from related health care fields

such as dentistry or veterinary medicine and applicants who have completed all requisite basic science courses as graduate students may be considered for acceptance into the appropriate level of medical school. In most cases, the applicant would be required to apply for a first year position regardless of degree held. If judged acceptable at interview, the candidate then could request the opportunity to demonstrate competence by being allowed to take the final examinations in Anatomy, Biochemistry, Histology, Physiology, and Integrated Neurosciences. All of these would have to be passed at or above the class mean and would have to be completed by July 1 of the summer preceding possible entry. He/she could then be admitted to the second year curriculum. He/she would be required to take all courses of the second year curriculum with the understanding that failure of a single course in either semester could be a basis for dismissal. If the student passes all second year courses, he/she would be promoted to the third year as a "regular" student subject to the rules and regulations applicable to all other students.

All applicants for advanced standing must be bona fide Texas residents with at least 90 hours of undergraduate study in an accredited U.S. or Canadian college or university. After July, 1997, the TTUHSC School of Medicine will accept no transfer applications from students or graduates of schools not accredited by the Liaison Committee on Medical Education.

The MD/MBA Joint Degree Program

In this joint degree program, the student will receive both MD and MBA degrees within the four years of medical school. With this program the intent is to produce outstanding physicians with additional insight into the intricacies of heath care management systems, finance, economics and delivery. With this educational background, physicians will have an advanced business background to use as they develop practices or as they begin careers in management for major health care organizations.

In the program structure, students will complete the 54-hour MBA program in four years, including the summers before and after the first-year medical school curriculum. Areas of study will include accounting, management strategy, business decision-making skills and methods, business information systems, as well as other core skills in the business curriculum. For a broader knowledge of the organizational context in which health care is provided, students will complete a seven course concentration in Health Organization Management (HOM) as part of the program.

The MBA (HOM) program is accredited by both AACSB (American Assembly of Collegiate Schools of Business) and ACHESA (Accrediting Commission for Education in Health Services Administration). This dual accreditation assures the prestige and enhances the value of MD/MBA.

Enrollment for the combined MD/MBA program is limited to 12 students per year.

Additional information and applications forms may be obtained from:

Office of Admissions
TTUHSC School of Medicine
3601 Fourth Street
Lubbock, TX 79430-0001 Phone: (806) 743-2297

The M.D./Ph.D. Combined Degree Program

For those students interested in pursuing a career in academic medicine as a physician-scientist, simultaneous enrollment in both the School of Medicine and Biomedical Graduate Program is possible. A program of study has been designed to permit the student to complete the requirements of both the M.D. degree and the Ph.D. degree in one of the School of Medicine's approved graduate programs. A limited number of exceptionally qualified M.D./Ph.D. students will be designated as Medical Scientist Scholars and will receive both stipend support and tuition (medical and graduate program) scholarships throughout the combined degree program. This program is designed to be completed in six to seven years (though may be longer) and will provide the student with rigorous training in both clinical medicine and biomedical research. Students interested in this program should so indicate on the application forms they submit to both the TTUHSC School of Medicine and the Biomedical Graduate Program. Application files of exceptionally qualified students will be reviewed for possible designation as Medical Scientist Scholars by the Medical Scientist Coordinating Committee. For further information concerning this program, please contact:

Office of Admissions
Texas Tech University Health Sciences Center
School of Medicine
3601 4th Street
Lubbock, TX 79430-0001
Phone: (806) 743-2297

Research Honors Program

This program has been established to provide the opportunity for selected medical students to pursue an in-depth research program with a faculty member of their choice. This Research Honors elective requires one year in addition to the four basic years of the medical curriculum and normally occurs between the second and third medical school years. While no credit toward graduation is granted during this year of enrollment, successful completion of the program will be acknowledged by the designation of "Research Honors" on the student's diploma. A variety of financial support mechanisms are available for this research experience.

CODE OF PROFESSIONAL CONDUCT/HONOR SYSTEM

By registration in the School of Medicine, each student subscribes to the Code of Professional and Academic Conduct which was developed and approved conjointly by students and faculty in 1985. The code is compatible with the regulations of the University, but is designed expressly for the School of Medicine. The purpose of the Code of Professional and Academic Conduct is to emphasize in the medical school environment those qualities of integrity, self-discipline, and professional behavior that are essential to physicians. The Code protects the rights of the student who may be reported for academic dishonesty or for non-professional conduct. If charged are deemed valid, there is a hearing before a student-faculty committee which recommends to the Dean appropriate action. There is an appeal procedure to ensure due process and the Dean makes a final decision based on the hearings and committee recommendations. A student handbook which includes the detailed Codes, as well as other relevant policies and procedures, is given each student at matriculation. They are available in the Office of Student Affairs.

STANDARDS FOR COMPLETION OF THE CURRICULUM

The School of Medicine faculty has developed minimum standards for entry into and progression through the medical curriculum. These standards provide guidance to achieve the Doctor of Medicine degree in preparation for licensure as a practicing physician and for postgraduate training. Throughout the medical education process, patient safety is of primary consideration.

Mastery of the essential functions of curriculum is required of all students. Satisfactory progression through the curriculum will be evaluated by the faculty under the following standards which encompass cognitive, physical, and behavioral requirements in six fundamental areas summarized below:

1. Use of motor skills such as palpation, auscultation, percussion, and other diagnostic maneuvers;

2. Use of sensory skills such as observing demonstrations, obtaining a medical history directly from a patient, and observing a patient's medical condition and/or nonverbal behaviors;

3. Communication with patients, physicians, and others on the medical team about a patient's condition in settings where communication typically is written and in settings were the time span available for communication is limited;

4. Intellectual, conceptual, integrative, and quantitative abilities necessary for problem-solving and diagnosis;

5. Activities which have a behavioral and/or social context including professional responsibility to patients, typical daily work-loads, working in an environment which is subject to rapid change without warning in unpredictable ways.

6. Ethical and professional attitudes and conduct.

A detailed copy of the Standards for Curricular Completion is available from the Office of Admissions:

Office of Admissions
Texas Tech University Health Sciences Center
School of Medicine
3601 Fourth Street
Lubbock, TX 79430

PROCEDURE FOR STUDENTS WITH DISABILITIES

Without compromising the standards required by the School or the fundamental integrity of its curriculum, the School recognizes that persons with disabilities, as that term is defined in the Americans With Disabilities Act, may fulfill the standards with reasonable accommodation. The School of Medicine is committed to developing innovative and creative ways of opening its curriculum to competitive and qualified candidates with disabilities. Requests for accommodation under the Standards for Curricular Completion will be considered on an individual basis and reasonable accommodation will be arranged if appropriate. The use of a trained intermediary to observe or interpret information is considered to compromise the essential function of the physician.

When an applicant comes for an interview at the School of Medicine, a copy of the detailed Standards for Curricular Completion will be included in the Orientation Packet. Questions about the Standards are welcomed and interviewees will be informed that they must be qualified to meet all of the Standards, with or without accommodation.

If a student is offered and accepts an admissions offer from the School of Medicine, the student must then sign a form acknowledging that he/she has read and understands that the Standards for Curricular Completion must be met with or without accommodation. A request for accommodation must be presented in writing to the Office of Student Affairs along with supporting documentation about the disability from an appropriate specialist and the proposed accommodation(s). The deadline for requests with supporting documentation is normally 30 days prior to the beginning of the first semester of enrollment. The School may also seek independent review from a specialist of its choice. The decision on whether or not an accommodation request will be granted is made by a committee composed of the Associate Dean for Educational Programs, the Assistant Dean for Admissions and Student Affairs, the Student Affairs Committee, and ad hoc faculty knowledgeable regarding the area of disability. Such decisions are subject to review and approval by the Dean. If reasonable accommodation is feasible, effort will be made to provide the accommodation as classes begin. If the request for accommodation is denied, the student will be notified in writing prior to the start of classes. For requests with documentation received prior to April 15, effort will be made to notify the student of the decision regarding their request prior to May 15.

In the area of learning disabilities, the student should note that he/she will have to petition the National Board of Medical Examiners for any accommodation on the United States Medical Licensing Examinations (Steps I, II, and III) and that this process in an addition to and separate from any request for accommodation by the Texas Tech School of Medicine.

STUDENT LIFE

The School of Medicine has traditionally been noted for the open friendliness of its student body and faculty. The relatively small size of its classes makes for an enhanced ability to get acquainted with each other. Lubbock, Amarillo, and El Paso offer good quality of life for students and student families. In the first two years at Lubbock, the geographic relationship of the School of Medicine to the Texas Tech University campus provides a wealth of recreational and cultural experiences. Housing is easily available and relatively economical and the non-humid climate is an agreeable one. Thus, the unstructured "quality of student life" is generally a good one. There are a number of organizations and resources which are designed to facilitate the ability to enjoy and gain from the medical school experience.

HEALTH SCIENCES CENTER STUDENT SERVICES

In 1985, the services common to the Schools of Medicine, Nursing, and Allied Health were brought under one Director of HSC Student Services. The basic elements of this office are:

1. OFFICE OF THE REGISTRAR

As custodian of the students' permanent academic records, the Registrar's Office is also responsible for registration, grade reports, transcript requests, enrollment and veteran certification. Questions related to Texas residency status are resolved in this office.

2. OFFICE OF FINANCIAL AID

Students desiring financial assistance or information regarding loans and scholarships are aided by the Financial Aid Office. Federal, state, and local programs are available to assist students who appropriately demonstrate financial need. Details are available elsewhere in this catalog.

3. STUDENT SERVICES

A. Provision of or access to student insurance.
Each student is required to provide for his/her own health care coverage while enrolled in the HSC. Information and application forms may be obtained from Student Services.

B. Extracurricular Events.
Tickets to cultural events in the community and on the TTU campus are available through Student Services, as are discount movie tickets.

C. Commencement.
Coordination of graduation exercises for the HSC is provided by Student Services.

D. HSC Student Senate.
The Office of Student Services serves as sponsor and provider of staff support to the HSC Student Senate which is described below.

E. Legal Counseling and Mediation Services.
Legal counseling and mediation services are available to students through the Attorney for Students in West Hall on the Texas Tech University Campus.

STUDENT ORGANIZATIONS

1. HSC STUDENT SENATE

Organized in 1986, the HSC Student Senate was established to foster better relationships among the students in the Health Sciences Center schools and to provide a forum for discussion of mutual concerns. The School of Medicine selects six representatives to the Senate; the Graduate Program elects two; the School of Nursing elects six; and the School of Allied Health elects six. HSC Senators represent the interests of their respective schools as well as the interests of the students at large. They receive budget requests and justifications from each school and formulate a request to the University for funding of approved student groups. Funds obtained from the University are allocated by the Senate to each of the schools. In addition, the Senate publishes a newsletter, plans HSC social functions, and acts as student advisory body to the President of the HSC on request.

2. MEDICAL STUDENT GOVERNMENT

The Medical Student Government was established by students and faculty in 1984. Each class is represented by its President, Vice-president, and two additional elected members. The governing body acts as the voice of the medical students to the Dean, and is the interface between the student body and the administration. It appoints members to standing committees of the school and serves as the Honor Council of the student body. The Vice-presidents of the junior class at Amarillo, Lubbock, and El Paso serve as the student representatives on the committee which determines priorities for campus transfer. Monies allocated to the students of the School of Medicine by the HSC Senate are dispersed in turn to approved student groups by the Student Government which hears budget requests and justifications. The Medical Student Government is staffed by the Office of Student Affairs, to which it is advisory on all matters of student life.

3. NATIONAL AND STATE ORGANIZATIONS

TTUHSC School of Medicine has chapters of a number of national and state medical organizations: American Medical Association/Texas Medical Association (AMA/TMA) Medical Student Section; American Medical Student Association (AMSA); and American Medical Women's Association (AMWA). Membership in all organizations is open to all medical students.

4. LOCAL ORGANIZATIONS

There are a number of "special interest" groups which are officially sanctioned by the Medical Student Government, from which they receive full or partial funding. These include, but are not limited to, the Graduate Student Association, Emergency Medicine Club, Family Practice Student Association, Internal Medicine Club, Obstetrics/ Gynecology Club, Multicultural Health Issues Association (MCHIA), Pediatrics Club, Psychiatry Club, Radiology Club, Society for Medical Advancement of Research and Technology (SMART), Student Organization for Animals and Animal Research (SOFAAR), Surgery Club, and Phi Beta Pi service fraternity. Events are planned around the organization's primary areas of interest. Membership in each club is open to and encouraged for all students. The clubs frequently combine efforts and resources to sponsor speakers and events.

5. ALPHA OMEGA ALPHA

The Zeta Chapter of Alpha Omega Alpha honor society was chartered at TTUHSC in 1982. Membership in this society is limited to 1/6 of a graduating class, selected from its academic top quartile. Zeta Chapter selects one-fourth of its members in their Junior year and the other three-fourths in their Senior year.

RECREATIONAL OPPORTUNITIES

Students enrolled in the HSC are entitled to enjoy the recreational and cultural advantages of a major university. In the first two years for all students and in the third and fourth years for Lubbock-based students, student fees provide membership in the TTU Student Recreational Center (SRC). This is an outstanding facility with excellent equipment, space, and programs. An olympic-size pool provides indoor/outdoor swimming and sunning. There are lighted tennis courts; running tracks; handball and squash courts; basketball courts; weight training equipment; aerobics classes; and playing areas for intramural sports of all descriptions. The Department of Recreational Sports also sponsors periodic ski trips, climbing expeditions, and raft trips. Between the University and the HSC campuses, there is an active intramural sports program.

At Amarillo, students may use the Wellness Center located on the campus. Cost for use of this facility is covered by the student fees.

El Paso students are eligible for membership in the recreational program of the University of Texas at El Paso (UTEP) for a small annual fee.

STUDENT HEALTH SERVICES

The Student Health Service is dedicated to promotion and maintenance of optimal physical, emotional, and social well-being. Ambulatory services in primary care are covered by student fees and are available by appointment between 8:00 and 5:00, Monday through Friday in the Family Practice Center of the Department of Family Medicine. Faculty and residents are available for consultation and emergency care after hours. Physician care is provided without charge but students may have to pay for laboratory, radiographic, or consultative services which are not available in the Family Practice Center. Prescriptions may be filled at the Student Health Pharmacy located in Thompson Hall on the Texas Tech Univeristy Campus where students may receive a discount. Emergency Room visits, consultation, and hospitalization is at the student's expense. All students are required to have adequate health insurance. Immunizations required prior to registration are detailed in The Admissions Process section. They may be completed or updated through the Student Health Service.

The Texas Tech University Counseling Center provides psychological counseling upon request for students at no cost to the student. A variety of other counseling resources are available, but the student may be responsible for payment.

INSURANCE

As a contingency for registration into each year of the curriculum, the student will be required to produce proof of hospitalization insurance effective by date of matriculation. Information concerning various programs for insurance for medical students may be obtained from:

HSC Student Services - Room 3B310
Texas Tech University HSC
3601 4th Street
Lubbock, TX 79430 (Telephone: 806-743-2300)

It is understood that expenses not covered by insurance will be the responsibility of the student.

Very few young people carry long-term disability insurance, and this is becoming a progressively greater issue in this era of increasing hepatitis-B and HIV prevalence. A fee of $ 75.00 per year is charged to each student to purchase long-term disability for each class of medical students. The amount of coverage is negotiated annually. Additional disability insurance may be purchased by the student if desired.

FINANCIAL INFORMATION

TUITION AND FEES 1998-99

Tuition and fees for each academic year are due and payable in full at the time of registration. A student is not enrolled until all fees are paid. Fees may be changed without notice by the Board of Regents.

Tuition and Fees for First Year

	Years 1, 2, 4	Year 3
Tuition	* $6,550.00	* $6,550.00
Institutional Tuition	664.00	991.00
Student Services	288.00	345.00
Laboratory	32.00	32.00
Microscope Rental	120.00	120.00
Liability Insurance	25.00	25.00
Property Deposit	30.00	30.00
University Center	30.00	45.00
Student ID	5.00	5.00
Student Health Insurance	**	**
Medical Services Fee	104.00	156.00
Parking Permit	57.00	57.00
Information Technology Fee	50.00	50.00
International Education Fee	2.00	2.00
Long-Term Disability Insurance Fee	50.00	50.00
Total Tuition and Fees	$8007.00	$8458.00

* Installment option available at 1.5% of unpaid balance.
**TTU/TTUHSC Plan - Single Student/12 months = $499.00
TMA Insurance Trust-Single Student/12 mos. = $320.00 - $1120
with $1,000 deductible (quarterly payments=$80.00 - $280).

For non-residents of the state of Texas, tuition is $19,650.00 per year for 1998-99, making the total for tuition and fees $21,107.00 for years 1,2,4, and $21,558.00 for year 3.

The estimated student budget is $11,666 for housing, food, and other living expenses. For further information regarding tuition and fees contact:

The Registrar
Texas Tech University Health Sciences Center
School of Medicine
Lubbock, TX 79430

Texas Tech University Health Sciences Center reserves the right, without notice in this catalog, to change, amend, add to , or otherwise alter any or all fees, rates, or other changes set forth herein by action of the Board of Regents of Texas Tech University or the Texas State Legislature as the case may be.

REFUND OF TUITION AND FEES

A medical student who officially withdraws from the TTUHSC School of Medicine during the course of an academic year may be entitled to a refund of tuition and fees in proportion to the length of time between the first class day of each semester and the date of official withdrawal in accordance with the schedule below. Forms for withdrawal are available from the Office of the Registrar.

WITHDRAWAL

Prior to the first class day	100 percent
During the first five class days	80 percent
During the second five class days	70 percent
During the third five class days	50 percent
During the fourth five class days	25 percent
After the fourth five class days	None

VETERAN'S EXEMPTIONS FROM FEES UNDER THE HAZLEWOOD ACT

The following men and women who were legal residents of Texas at the time of entry into the Armed Forces and who have been legal residents of Texas for a period of not less than twelve months immediately preceding their registration in Texas Tech University Health Sciences Center School of Medicine are by state law exempt from the payment of all fees except laboratory and library fees or similar deposits and fees or charges for room and board: all nurses and honorably discharged members of the Armed Forces of the United States who served during the Spanish-American War, World War I, World War II (except those who were discharged from service because they were over the age of 38 or because of a personal request on the part of the person that he be discharged), the National Emergency which began on June 27, 1950 (also referred to as the Korean War), and all persons who were honorably discharged after service on active military duty, excluding training, for more than 180 days during the Cold War (which began on the date of the termination of the Korean War). These exemptions also apply to the children of members of the United States Armed Forces who were killed in action or died while in service during World War II, the Korean War, or the Cold War, and to orphans of members of the Texas National Guard and the Texas Air National Guard killed since January 1, 1946, while on active duty and certain children of veterans who died of military related causes and show financial need. This waiver must be applied for by the census (12th class day) date.

NOTE: The exemption from fees provided for above does not apply to a person if at the time of registration, he/she is eligible for educational benefits under federal legislation in effect at the time of his registration. Discharge papers must be presented by the student to the Registrar's Office, who will in turn certify the student's eligibility at the time of registration.

CAMPUS PARKING (OPTIONAL)

Limited parking facilities are available on the medical school grounds. Any student wishing to park on the campus will be required to obtain a permit and pay the Parking Permit Fee ($57.00 per year in 1998-99).

FINANCIAL AID

The Texas Tech University Health Sciences Center Office of Student Financial Aids is committed to working with each student in identifying the financial resources necessary to meet their financial needs to pursue their medical education.

Financial Aid available to School of Medicine students comes in different forms. Grants Federal and State funds that do not require repayment Scholarships State, Local and Private funds that do not require repayment Loans Federal, State, Local and Private funds that must be repaid

These funds are offered to students on the basis of financial need and other qualifications as specified by the donor organization.

Financial need is defined as the difference between the anticipated costs of attending the school and the amount of money available to the student from all sources. A needs analysis is required of applicants for most financial aid programs.

The scholarships administered by the School of Medicine are awarded based on various factors. These include, but are not limited to, financial need, academic achievement, class standing, and area of specialization.

No student or prospective student shall be excluded from participation in or be denied the benefits of any financial aid program on the basis of race, color, national origin, religion, or sex.

Students seeking financial aid or additional financial aid information should contact: The Office of Student Financial Aid Texas Tech University Health Sciences Center HSC 3B-310 Lubbock, TX 79430 Phone: (806) 743-3025

GRANTS

TPEG - Texas Public Education Grant

SCHOLARSHIPS

Administered by TTUHSC

Dr. Donald H. & Mrs. Bradley
Robert C. Carmen Memorial
Peter L. Chan Endowed Scholarship
Martin & Alice Dalton Scholarship
Christine Devitt Medical Student Scholarship
Arleigh & Eloise Drake Endowed Scholarship
Carole Durrett Endowed Scholarship
Robert A. Flygare Memorial Scholarship
HSC Student Endowed Scholarship
Lawrence K. Jones Endowed Scholarship
Jack B. Kelley Memorial Scholarship
Richard Spencer Lewis Memorial Scholarship
Lubbock-Crosby-Garza Medical Society Scholarship

Dr. James E. Loveless Endowed Scholarship
Robert McDaniel, M.D. endowed Scholarship
April Ann Morris Memorial Scholarship
Lee & Beulah O'Neil Medical Scholarship
School of Medicine Endowed Scholarship
Covar and Gene Dabezies Presidential Scholarship
Mary Nell Sowell Presidential Endowed Scholarship
School of Medicine Presidential Endowed Scholarship
Bob and Marcy Lawless Presidential Endowed Scholarship
Southern Medical Association Student Tuition Scholarship

Administered through the funding agency:
Indian Health Service Scholarship Program
Outstanding Rural Scholar Recognition and loan Forgiveness Program
Public Health Service National Health Service Corps
U.S. Military Scholarships
Alpha Epsilon Iota Scholarship Fund
American Association of University Women Educational Foundation
Joseph Collins Foundation Scholarship Fund
Minnie L. Moffett Fellowship Fund
March of Dimes Research Fund
Jerry L. Pettis Memorial Scholarship Fund
National Hispanic Scholarship Fund
National Medical Fellowship

LOAN PROGRAMS (Long Term)

Administered through Office of Student Financial Aid-HSC:
Health Education Loan Program (HELP)
Primary Care Loan (PCL)
Robert Wood Johnson Loan Fund
Mexican-American Physicians' Association Loan Program
Ralston Student Loan Fund
Federal Family Education Loan Programs (FFELP):
- Federal Stafford Loan Program
- Federal Unsubsidized Stafford Loan Program
- Federal Parent Loan Program (PLUS)

Federal Perkins Loan Program (formerly National Direct Student Loan NDSL)
Texas Medical Association:
- May Owen Trust of Texas Medical Association
- George Plunkett Red Fund of Texas Medical Association
- Valley Family Physicians Fund of Texas Medical Association
- Women's Auxiliary Loan Fund

Administered through funding agency:
Franklin Lindsay Student Aid Fund
National Association of Residents and Interns (NARI)
Minnie Stevens Piper Foundation Loan Fund

HOUSING

The School of Medicine does not furnish living quarters for its students. Each student makes his/her own arrangements. Most students live in apartments or houses in the community. The Office of Student Affairs prepares an annual roster of available accommodations. Texas Tech University does maintain 20 residence halls which accommodate approximately 7,300 students for board and room. Medical students are eligible for university housing if they desire it.

Students interested in university housing should contact:

Texas Tech Housing Office
P.O. Box 4629
Texas Tech University
Lubbock, TX 79409
(806) 742-2661

THE DOCTOR OF MEDICINE PROGRAM

Undergraduate Medical Education

The goal of the School of Medicine is to provide students with a broad base of knowledge in the basic and clinical sciences, so that each graduate is well prepared to enter any field of postgraduate medical training. In recognition of the specific needs of West Texas, interest in the disciplines related to primary patient care is encouraged. The curriculum has two primary objectives:

1. to provide a broad introduction to medical knowledge while developing analytical skills in problem-solving; and
2. to enhance the ability of the students to assume responsibility for their own education as an on-going, life-long process.

To achieve these objectives, the curriculum is continually reviewed and appropriately modified to ensure the personal and professional growth of the future physicians. The School of Medicine has endorsed the efforts of the Association of American Medical Colleges to examine and modify curricula in order to make education and training relevant to physician practice in the twenty-first century.

There is a firm commitment to the philosophy that the curriculum is the property and responsibility of the faculty rather than the component departments of the school. The Dean selects an Educational Policy Committee which represents the faculty and the student body. This committee is charged with overall policy in shaping and modifying a high quality and well balanced medical education. There is a bicameral relationship with the Curriculum Operations Committee who are the course and clerkship directors and who are responsible for implementing policy and recommending change to the Educational Policy Committee. The management of the curriculum has been formally endorsed by the Liaison Committee on Medical Education.

The Liaison Committee on Medical Education (LCME) represents the Association of American Medical Colleges and the American Medical Association as the national accreditation body for medical schools. In May, 1995, the Texas Tech University Health Sciences Center School of Medicine was accorded an unqualified seven year accreditation, the longest period awarded at that time to a medical school of high quality. In 2002, a regularly-scheduled site visit by LCME will continue the accreditation process.

CURRICULUM

In the first year, each student is grounded in Gross, Microscopic, and Developmental Anatomy; Biochemistry; Integrated Neurosciences; and Physiology. Students also begin learning about the ethical, interpersonal, preventive, and socio-economic aspects of medicine and health care. In addition there is opportunity for clinical or research electives. The first year serves as preparation for the second in which background is provided in Microbiology, Pathology (including pathophysiology), Pharmacology, Introduction to Psychiatry, and Introduction to Internal Medicine. Building upon and integrating the knowledge of the basic sciences, there is an extensive course in patient assessment in which the fundamentals of interviewing and physical diagnosis are correlated with an introduction to analytical problem-solving skills, epidemiology and biostatistics. Basic Cardiac Life Support (BCLS) certification is required prior to beginning the third year curriculum.

The third year is characterized by several changes in educational format. The setting is in the clinical arena and each student focuses on one clinical discipline at a time. During the third year, each student will rotate through twelve-week clerkships in Internal Medicine and Surgery, and six-week clerkships in Family Medicine, Obstetrics/Gynecology, Pediatrics, and Psychiatry.

The clinical curriculum is replicated on the regional campuses at Amarillo, El Paso, and Lubbock. Fourth year electives are offered on each campus and also at the regional campus at Odessa. The quality of the educational experience and the numbers and diversity of patient mix between the clinical campuses are carefully monitored and every effort is made to maintain comparability in the educational experiences between campuses. Students at each campus are tested at the end of each clerkship with the same external national examination. Our students thus may be compared with national norms as well as with each other on the three campuses. The values are well correlated and can be described as a single- campus experience.

In the fourth year, each student completes a one-month clerkship in Neurology, two one-month selective experiences chosen from Family Medicine, Obstetrics/Gynecology, Pediatrics, and Psychiatry, and five months of broadly based elective experiences. Each student plans an individualized program which is reviewed by a faculty committee for breadth of general educational experience and appropriateness to the particular student's academic background. In this manner, each student can test or compare various disciplines as potential career choices, can shore up perceived areas of weakness, and can broaden exposures to a variety of experiences and locations.

During the third and fourth years, each student has a faculty advisor with whom to discuss career options and residency plans. The Office of Student Affairs likewise is active in orientation programs and in individualized attention and counsel to students regarding residency selection. In the past several years, Tech graduates have competed successfully in the National Resident Matching Program with 75 to 80% of students being matched with their first or second choice of postgraduate training programs.

ACADEMIC SUPPORT SERVICES

Students receive a variety of support services above and beyond the formal academic program. Most importantly, students have ready access to faculty for assistance and are actively encouraged to utilize this valuable resource. In addition, the Office of Student Affairs contacts each student who demonstrates any indication of academic difficulty and explores with the student possible areas of difficulty with appropriate counsel or referral for resolution. In the basic science curriculum, course directors monitor student progress and tutorial services are available in some departments. In the clerkships academic progress is monitored by the clerkship directors. Seminars and individual assistance in modification of learning styles are available through a full time educational specialist in the Office of Student Affairs. Assistance in personal problems which result in academic difficulty is likewise available from a variety of resources including the University Counseling Center.

LIBRARY

A new, state-of-the-art facility has recently been completed on the Lubbock campus. The new library will have over 50,000 square feet of space and will feature some 30 group study rooms.

The Texas Tech University Health Sciences Center Library presently contains more than 250,000 total volumes and over 2,000 journal subscriptions. In addition, the Library has a large audiovisual collection of slides, videocassettes, motion pictures and microcomputer software. Library services and collections are located on each of the four campuses with Lubbock housing the major collections and serving as the administrative and dispersing center.

The Library is completely automated with an integrated system, the Library Information System (LIS) which includes an on-line catalog and circulation. Full Medline, CINAHL, IPA, and Micromedex are also available off of the Library home page. Computerized search services with access to over 75 data bases on a variety of health-related subjects are available through the mediation of skilled searchers.

The Library currently manages two teaching-learning centers which will be combined into one in the new library. In addition to housing the non-print collection, the TLC has a variety of microcomputers available for student use. The Teaching-Learning Center assists students in the learning experience through formal classes as well as individual instruction.

Formal classes in search strategy of bibliography databases are conducted frequently in order to prepare the student to be able to access the vast amount of data available. Other courses in life-long learning, techniques of how to filter bibliographic data and other formal courses are offered through the Library.

Clinical medical librarians are assigned to the various clinical departments and make rounds with faculty, residents and students. They are the bibliographic resource for the teaching team.

Students also have access to the Texas Tech University Library, which contains more than 1.5 million items, including U.S. Government documents and substantial science holdings.

GRADING

Most courses are graded on a numerical scale with a grade of 75 considered as a satisfactory score and a grade of less than 70 as a failing score for a course. First year electives and senior electives are graded on an Honors/Pass/ Fail system. In the clinical clerkships, numerical scores are accompanied by narrative descriptions of performance. A weighted grade point average based on grades and course contact hours is calculated annually for each academic year and cumulatively for progress through the curriculum. Decisions on progression through the curriculum are based on review of the cumulative record and on demonstration of professional behavior.

ACADEMIC ADVANCEMENT

The Grading and Promotions Committee is an elected faculty committee which is responsible for reviewing the academic and professional progress of each student at least annually. It determines that a given student be unconditionally promoted, be promoted with conditions, be given remedial work, be required to repeat all or part of an academic year, or be dismissed. Student progress is reviewed and decisions based on written policies are made at the end of each semester. There is a published series of steps for due process. The Dean as Chief Academic Officer makes the final decision.

Satisfactory academic achievement is only one of several criteria used in judging the fitness of a student for the practice of medicine. Demonstration of clinical competence, integrity and professional behavior are also considered in review of the student's progress through the curriculum.

Under usual circumstances an academic record with a minimum grade of 75 in each course is considered satisfactory for progress to the next academic year. Each record is reviewed in the context of the individual student's cumulative cognitive and non-cognitive performance through the total curriculum.

UNITED STATES MEDICAL LICENSING EXAMINATION (USMLE)

TTUHSC medical students are required to take the June administration of Step I of the United States Medical Licensing Examination (USMLE) following completion of their second year. Since the test is a component of application for licensure to practice medicine, the student is required to pay for the examination. Passing USMLE Step I is a condition for remaining in Year III of the curriculum. Students will also be required to take and record a score on Step II prior to graduation. While passing Step II is not currently required as a condition for graduation, this could change in the future. If that decision is made, an addendum will be inserted into the catalog.

CURRICULUM CONTENT AS OF 1998-99 ACADEMIC YEAR

First Year: Begins August, Duration 38 weeks, Scheduled hours per week = 27

Required Courses

	Contact Hours	Credit Hours
Gross Anatomy	169	8
Histology	83	4
Biochemistry	120	9
The Physician in Society	20	1
Neurosciences	166	8
Physiology	153	9
Concepts in Community and Ambulatory Care	70	4
Elective	16	

Second Year: Begins August, Duration 38 weeks, Scheduled hours per week = 27

Required Courses

	Contact Hours	Credit Hours
Microbiology	146	9
Pharmacology	107	7
Medical Pathology	230	14
Patient Care: An Integrated Approach	138	6
Intro. to Internal Medicine	100	7
Intro. to Psychiatry	53	3

Third and Fourth Year: Begins July, Duration 80 weeks

Required Clerkships

	Contact Weeks	Credit Hours
Internal Medicine	12	18
Surgery:		18
General Surgery	9	
Surgical Subspecialties	2	
Anesthesiology	1	
Pediatrics	6	9
Obstetrics/Gynecology	6	9
Psychiatry	6	9
Family Medicine	6	9
Neurology	4	6
Senior Clerkships (2 mos. from Fam Med, Ob/Gyn, Peds, Psych)	8	12
Electives (individually approved)	20	30

CONTINUING MEDICAL EDUCATION

Continuing Medical Education at Texas Tech University Health Sciences Center School of Medicine (TTUHSC) has as its goal the improvement of health care through the presentation of quality educational programs designed to provide opportunities for physicians to enhance their knowledge and skills. TTUHSC's Office of Continuing Medical Education is accredited by the Accreditation Council for Continuing Medical Education enabling the sponsorship of educational programs for the American Medical Association (AMA) Physicians Recognition Award (PRA). Accredited programs assist physicians in meeting requirements for relicensure in those states with requirements and membership in various specialty organizations. The CME staff collaborates with medical school faculty to plan, develop, and implement workshops, conferences, seminars, and Grand Rounds on a variety of subjects designed to keep physicians up-to-date.

In addition to the traditional forms of educational programs, the Office of Continuing Medical Education utilizes HealthNet telecommunication technologies to deliver CME to the regional campuses and to selected hospitals in the west Texas region. Using this technology, the School of Medicine is able to provide current information to physicians in rural areas without the expense of travel and lost practice time. A second phase of the interactive telecommunications system enables physicians in rural areas to access the faculty at the School of Medicine for consultation. Additionally, the system uses the latest technology available to allow the consulting physician to view x-rays and analyze ECGs. This type of consultation between physicians enhances the care provided by the rural physician. The third phase of the system will be the development of study materials such as computerized simulations, written material, video and audio tapes, and other materials that allow for individualized study. The scope of activities using this state-of-the-art technology is limited only by one's imagination.

These innovative approaches linking physicians with tertiary care facilities have far reaching implications for the delivery of quality educational activities in rural America as well as in third world countries for the improvement of health care for under served populations. Texas Tech University Health Sciences Center School of Medicine is proud to make these contributions.

DEPARTMENTS OF THE SCHOOL OF MEDICINE

The curriculum of the School of Medicine is determined by the Educational Policy Committee of the faculty. The educational program is then implemented by the various departments, with certain of the courses as interdisciplinary units. The Chair of each department serves as educational and administrative chief, but appoints Course or Clerkship Director(s) to oversee the educational offerings of the department. The pre-clinical departments are housed at Lubbock and each has a single Chair. The Chairs of the clinical departments are located on the Lubbock campus except for Emergency Medicine which is sited in El Paso. Each regional campus has a Regional Chair for the campus department. The curricular offerings on each clinical campus are coordinated within each department, so that comparable educational experiences are offered through the Tech System. Students at each regional campus likewise complete each clerkship with the same National Board of Medical Examiners unit examination, so that quality of education experience can be compared across campuses and with students across the nation. The following pages present brief descriptions of the various departments of the School of Medicine. More detailed information regarding the post-graduate and/or research activities of each department may be obtained by writing to the chairman of the particular department.

DEPARTMENT OF ANESTHESIOLOGY

Professor Gabor B. Racz, M.D.
Chairman of Anesthesiology
Associate Professor Edward A. Wilson, M.D.
Associate Chairman of Anesthesiology (Lubbock)
Associate Professor David T. Raphael, M.D., Ph.D.
Interim Regional Chairman (El Paso)
Professors: Cockings, Heavner, Kao
Associate Professor: Wilson
Assistant Professors: Abe, Adolph, Carter, Grewal, Kim, Randolph, Rani, Shi, Suleiman
Instructors: Greene, Kelley, Ricaldi

The Department of Anesthesiology offers the medical student an opportunity to apply basic sciences knowledge to a patient setting. The primary goal is to expose future physicians to current methods of life support and to enable students to approach with confidence the management of the airway of the unconscious patient and the support of the respiratory and cardiovascular system. The department is involved in basic science, preclinical teaching with electives and preceptorships offered. Instruction will be given in the management of respiratory problems, acid-base and fluid balance, and the use of mechanical ventilators. Basic and clinical research opportunities are available to interested students. Additionally, the Department of Anesthesiology offers fourth year multidisciplinary electives in the Pain Center on the Lubbock campus. Patients are seen in the clinic setting as well as in-patient settings in the teaching hospitals. Students will learn about physiological assessment as well as different therapeutic modalities used in the management of chronic pain.

DEPARTMENT OF CELL BIOLOGY AND BIOCHEMISTRY

Professor Harry M. Weitlauf, M.D.
Chair
Professors: Behal*, Chilton, Everse, Faust, Hutson, Morrow, Norman, Poduslo*, Reid*, and Stocco
Associate Professors: Beale, Coates, Dalley, Khan, Little, Morgan, McGlone*, Pelley, B. Pence*, Phillips*, Sridhara, Whelly, and Wright*
Assistant Professors: Cornwall, Coue, Hardy, Lee, MacDonald, Pfarr, Ravnik, Webster, Whisnant*, and Williams
Faculty Associate: B. Shaw
*Joint Appointment

The Department of Cell Biology and Biochemistry offers a curriculum designed to prepare student physicians in the fields of Cell Biology, Biochemistry, Histology, Developmental Biology, Gross Anatomy, and Molecular Biology. Courses applicable to these fields contain information which is both clinically relevant and applicable to academic medicine. The department also offers two separate programs leading to the combined MD/PhD degrees; one in Anatomy and one in Medical Biochemistry. These specialized curricula involve medical training during the first two years of study followed by a period of time devoted entirely to graduate study in one of a wide variety of research areas represented within our department. After completion of the research project, the student begins the traditional third year of medical study and graduates after the fourth year with an M.D. and a Ph.D. degree.

Required courses for the traditional medical school curriculum:

MBCH 5080 - MEDICAL BIOCHEMISTRY. This one-semester course provides the biochemical base for understanding the clinical metabolic problems and processes. Lecture format is supplemented by small group discussion and clinical correlations.

MCBA 5041 - HUMAN HISTOLOGY AND CELL BIOLOGY. An integrated course of anatomy starting with the ultrastructural and light microscopic study of cells, continuing through the basic tissues and their organization into the various organs of the body.

MCBA 5060 - HUMAN GROSS ANATOMY. A highly integrated course of general anatomical study (including human dissection) which embodies the gross morphology of the body and coordinates it with the clinical developmental and microscopic aspects of the human body.

Required courses for the Anatomy MD/PhD program:

MCBA 5041 - HUMAN HISTOLOGY AND CELL BIOLOGY. See above.

MCBA 5060 - HUMAN GROSS ANATOMY. See above.

MBCH 5080 - MEDICAL BIOCHEMISTRY. See above.

ANSC 5403 - BIOMETRY (4:3:2). Introduction to biological statistics. Observations, probability, "t" test, analysis of variance, mean separation procedures, linear regression and correlation, and chi-square. Introduction to computerization of statistical analyses.

GANM 5602 - THE CELL CYCLE (6:6:0). Prerequisite: consent of instructor. Examination of DNA replication and repair, meiosis and recombination, and mitosis and the genetics of cell cycle control.

GANM 5606 - MECHANISMS OF CELLULAR DIFFERENTIATION (6:6:0). Prerequisite: consent of instructor. Topics include the determination of cell fate in invertebrates and vertebrates, lineage versus environmental controls, multipotential stem cells, and the regulation of cell type-specific gene expression.

GBCH 6122 - MEDICAL BIOCHEMISTRY PROBLEM SOLVING (1:1:0). Concurrent course to GBCH 5921/5621 to help students develop problem solving skills. Discussion of solutions to assigned problems with topics correlated to lectures in GBCH 5921/5621.

GANM 6704 - CELL FUNCTION AND REGULATION (7:7:0). Topics include structure and function of membranes and organelles, mechanisms of transcription and translation, and regulation of cellular processes including both endocrine and nonendocrine aspects. (To be dual listed with GBCH 6704).

GANM 7000 - RESEARCH (V1-12).

GANM 8000 - DOCTORAL DISSERTATION (V1-12).

Required courses for the Medical Biochemistry MD/PhD program:

MBCH 5080 - MEDICAL BIOCHEMISTRY. See above.

GBCH 6122 - MEDICAL BIOCHEMISTRY PROBLEM SOLVING (1:1:0). Concurrent course to GBCH 5921/5621 to help students develop problem solving skills. Discussion of solutions to assigned problems with topics correlated to lectures in GBCH 5921/5621.

GBCH 6322 - BIOMEDICAL RADIOISOTOPE TECHNIQUES (3:3:0). Prerequisite: GBCH 5921, CHEM 4303, 4306, 4307, or equivalent. Basic radioisotope techniques as used in biomedical research with special emphasis on liquid scintillation counting techniques.

GBCH 6522 - MOLECULAR BIOLOGY OF EUKARYOTES: NUCLEIC ACIDS (5:5:0). Prerequisite: GBCH 5921 or equivalent and consent of instructor. An in-depth study of nucleic acid biosynthesis and gene expression and its control in eukaryotes, as well as the study and application of the principles of genetic engineering to nucleic acid structure and molecular biology.

GBCH 6533 - MOLECULAR BIOLOGY OF EUKARYOTES: PROTEINS (5:5:0). Prerequisite: GBCH 5921 or equivalent and consent of instructor. An in-depth description of the process of protein biosynthesis, degradation, and regulation in eukaryotes, as well as the study of physic-chemical methods used to characterize proteins and their molecular structure.

GBCH 6704 - CELL FUNCTION AND REGULATION (7:7:0). Topics include structure and function of membranes and organelles, mechanisms of transcription and translation, and regulation of cellular processes including both endocrine and nonendocrine aspect. (To be dual listed with GANM 6704).

GBCH 7000 - RESEARCH (V1-12).

GBCH 8000 - DOCTORAL DISSERTATION (V1-12).

Other available courses are described under Cell Biology and Biochemistry in the Graduate Program section of this catalog.

DEPARTMENT OF DERMATOLOGY

Professor Ronald P. Rapini, M.D.
Chairman
Professor Emeritus: Kenneth H. Neldner, M.D.
Assistant Professor: Farah Shah, M.D.

The Department of Dermatology provides educational and research programs in dermatology for (1) undergraduate medical students; (2) residents; and (3) other students requiring instruction in dermatology. There are many clinical faculty in West Texas communities in addition to the full time individuals listed above. The department organizes a 15-hour required dermatology course that appears as part of the larger Introduction to Internal Medicine course in the second year of medical school. A one-month preceptorship elective is offered to fourth year medical students and to residents at all levels of training in other disciplines. There is broad exposure to general dermatology, pediatric dermatology, dermatopathology, dermatologic surgery, and dermatologic research.

DEPARTMENT OF EMERGENCY MEDICINE

Associate Professor Matthew J. Walsh, M.D.
Interim Chairman (El Paso)
Associate Professors: Brian K. Nelson, M.D. (El Paso)
Assistant Professors: Bryan, Haynes, Loflin, Mackay, Marill, Peterson (El Paso)

Emergency Medicine, the newest primary specialty, concentrates on the initial care and stabilization of the seriously ill. In addition, the emergency physician triages and begins treatment of any patient presenting for help.

Fourth year students are offered an elective in Emergency Care at each campus. They are afforded the opportunity to provide initial evaluation and treatment for acutely ill patients under direct supervision. Areas given particular emphasis include airway management, trauma evaluation, Emergency Medical Services, behavioral emergencies, shock resuscitation and decision making.

A second elective is offered at the El Paso campus for students wishing to concentrate on emergency medicine subspecialties such as pediatric emergencies, toxicology or research.

A third elective is available in El Paso for students interested in an extensive prehospital care experience, to include communications, field experience, administration, quality assurance and protocol development.

DEPARTMENT OF FAMILY AND COMMUNITY MEDICINE

Associate Professor Richard V. Homan, M.D.
Chair
Professor Charles V. Wright, Jr., M.D.
Regional Chair (Amarillo)
Assistant Professor Mary Spalding, M.D.
Interim Regional Chair (El Paso)
Professor Leonard Morgan, M.D., Ph.D.
Regional Chair (Odessa)
Professors: Shields , Way (Lubbock)
Associate Professors: Bryan, Egerton, Freeman (Amarillo); Baker, Montgomery (Lubbock); Rathbun (Odessa)
Assistant Professors: McCaleb, Schneider, Tan (Amarillo); Coe, Cottrell, Hamilton, Kim, Kirby, Luna, Noriega, Perez, Reeves, Spalding (El Paso); Bryant, Chauncey, Cook, Dyer, Jones, Krebs, Mitchell, Peck, Ragain, Warner (Lubbock); Garcia, Otero, Sponsel, Williams (Odessa)
Instructors: Aragon, Rubio (El Paso); Counts (Lubbock); Brewer, Hicks (Odessa)

The Department of Family and Community Medicine is primarily concerned with provision of training in ambulatory and comprehensive medical care with particular emphasis on the family unit. The core of cognitive and procedural skills in Family Practice allows for a unique role in patient care. By combining and integrating bio-medical, behavioral and social sciences, ongoing comprehensive management of a wide variety of patient age groups and illnesses is achieved. The research of the department is conducted in clinical settings to develop and evaluate more effective methods of health care delivery. The department's laboratories include ambulatory care centers, physicians' offices, emergency medicine departments, nursing homes, and various types of health care clinics.

The department also serves as the Student Health Service to medical students on the Lubbock campus, and staffs the Student Health Service for all of Texas Tech University.

The department has significant involvement in the pre-clinical curriculum in courses such as the Physician in Society, Introduction to Community and Ambulatory Care, and Introduction to Patient Assessment. The Division of Preventive and Occupational Medicine is also involved in clinical care as well as instruction in the principles of statistics, epidemiology, environmental health and health promotion.

Required Course:

MFAM 7096 - FAMILY MEDICINE CLERKSHIP. A six-week core clerkship introducing students to the care of the undifferentiated ambulatory patient. Emphasis is on clinical problem-solving, management of common problems, and prevention and health promotion.

DEPARTMENT OF HEALTH ORGANIZATION MANAGEMENT

Professor E. Jay Wheeler, M.D., Ph.D.
Chairman
Associate Professor Grant Savage, Ph.D.
Associate Chairman
Primary Faculty: Blair, Buesseler, Cochran, McComb, Savage, Wheeler
Joint Faculty: Anderson, Arredondo, Boal, Bravaco, Chappell, Clancy, Hunt, Macy, McGovern, Montgomery, O'Malley, Philips, Ritchey, Sorenson, Stewart, Weddige, and Whitehead.

The TTUHSC School of Medicine and the College of Business Administration (COBA) of Texas Tech University jointly administer this Department and faculty from several schools participate. The Department of HOM has two goals: (1) to provide educational opportunities in the management of health care organizations, and (2) to conduct research in health care systems, health care policy, medical education, ethics and social responsibility. Courses and topical presentations in these areas are presented for qualified business students, medical students, residents, and practitioners. Students may apply to pursue an M.B.A. with a concentration in health organization managements, or an 18-hour graduate certificate in Business Studies in Health Organization Management for persons with baccalaureate, graduate, or medical degrees. The Health Organization Management Department participates in required and elective courses to provide medical students with information on health care systems and policies.

MGT 5306 - HOM I: MEDICAL ASPECTS (3:3:0). Prerequisite: MGT 5370 or consent of instructor. Focuses on the implications for the management of health care organizations of medical issues such as the natural history of disease, epidemiology and health policies. (GIHM 5306)

MGT 5307 - HOM II: MANAGED CARE ORGANIZATIONS (3:3:0). Prerequisite: MGT 5306 or consent of instructor. Examines fundamentals and contemporary issues in the organization and management of managed health care organizations. (GIHM 5307)

MGT 5308 - HOM III: MEDICAL GROUPS AND AMBULATORY CARE (3:3:0). Prerequisite: MGT 5307 or consent of instructor. An organization-based view of the health care system emphasizing the provision of health care to populations via medical group practices and ambulatory care organization. (GIHM 5308)

MGT 5309 - HOM IV: HOSPITALS AND INTEGRATED DELIVERY SYSTEMS (3:3:0). Prerequisite: MGT 5308 or consent of instructor. Analyzes and evaluates selected contemporary problems, issues, and trends in hospitals and integrated delivery systems. (GIHM 5309)

MGT 7000 - RESEARCH (VI-12).

BA 5382 - FIELD EXPERIENCE IN HOM (3:3:0:). Prerequisite: MGT 5306, or PUAD5334, or ECO 5337 and consent of instructor. Provides structured opportunities for students to interact with health care professionals in health care organizations, as an intern or research analyst.

DEPARTMENT OF INTERNAL MEDICINE

Professor Neil A. Kurtzman, M.D.
Chairman (Lubbock)
Professor Kenneth Nugent, M.D.
Associate Chairman (Lubbock)
Assistant Professor Dave Ganesha Muthali, M.D.
Interim Regional Chairman (Amarillo)
Professor William L. Hand, M.D.
Regional Chairman (El Paso)
Associate Professor Donald Loveman, M.D.
Regional Chairman (Odessa)
Professors: Casner, Martinez-Lopez, Verghese, Zuckerman (El Paso); J. Anuras, Bartholomew, Butler, Kimbrough, Laski, Mailliard, Sabatini, Wesson (Lubbock); Kantor, Loewenstein (Odessa) Associate Professors: Richards, Werner, Wolinsky (Amarillo); Ho, Pema, Rivera (El Paso); Cobos, Crawford, Galasso, Hodges, Jenkins, Lau, Trowers, Whitehead (Lubbock); Bartold, Burks, Furgeson (Odessa)
Assistant Professors: Ahmen, Chittivelu, Cutts, Fu, Khandheria, Muthali, Srinivasan (Amarillo); Bright, Diaz, Faccini, Kolli, Meza, Nwosu (El Paso); Buscemi, Jumper, Keung, Mallarino, Rizk (Lubbock); Abbas, McKibben (Odessa)
Instructors: Soleja, Verma (El Paso); Malouf, Stachowiak (Lubbock)

The goal of the Department of Internal Medicine is to instruct students and housestaff in the diagnosis, pathophysiology, and comprehensive management of disease. Central to this goal is the development of skills in obtaining a complete history and performance of an accurate and thorough physical examination by direct instruction in a patient care setting. Members of the department participate actively in instruction in pathophysiology with basic science departments in the first two years, providing a bridge between the science and the art of medicine. Comprehensive and cost-effective diagnosis and management of disease are the focus of the third-year clerkship and the fourth-year externships and subspecialty electives. Daily contact with faculty for both bedside and didactic teaching and participation in the patient care team are major aspects of these courses. Both inpatient and outpatient clinical settings are utilized for teaching. The department offers electives in all medical subspecialties Cardiology, Rheumatology, Infectious Disease, Nephrology, Endocrinology, Gastroenterology, Pulmonary Disease, Hematology-Oncology, and Allergy. Externship experience is available on the medical wards and in the Medical Intensive Care Unit. The department is active in numerous research projects and students interested in research may take electives to participate in certain projects.

Required Courses:

MINT 6050 - INTRODUCTION TO MEDICINE. This is an interdepartmental course covering physical diagnosis and clinical reasoning. Physical diagnosis is presented through lecture and small-group demonstration, followed by direct experience and instruction in a patient care setting. Common presentations of diseases and pathophysiology are covered in a series of coordinated lectures.

MINT 7091 - CLERKSHIP IN INTERNAL MEDICINE. In this twelve-week rotation, the student participates as a member of the ward team, honing skills in performing histories and physicals, and in the collection, integration, and documentation of information for comprehensive diagnosis. Concepts of practical medical therapeutics and management are presented, but emphasis is on understanding pathophysiology and accurate diagnosis. Outpatient experience is provided in a community setting.

DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY

Professor LaJean Chaffin, Ph.D.
Interim Chair
Professors: Chaffin, Hentges, Lefkowitz, D. Pence, and Straus
Associate Professors: Fralick, Hamood, Joys, Ritzi, and Rolfe
Adjunct Assistant Professor: Amonett
Additional faculty contributing to MMB 60631: Dougherty, Lampe, D. Lefkowitz, Marsh, Miller, Smith, Waagner, and Way

The Department of Microbiology in the School of Medicine offers programs in microbiology for (1) undergraduate students in the medical curriculum and related health sciences; (2) graduate students majoring in microbiology; (3) other students requiring instruction in microbiology.

Medical School Program: The Department of Microbiology offers a required comprehensive course in medical microbiology for second-year medical students. The course is divided into lecture, laboratory, and clinical correlation conferences. The lectures provide information on the role of microorganisms in the production of disease. The clinical correlation conferences, given by members of the various clinical departments in the School of Medicine show the relevance of microbiology in the practice of medicine. The laboratory illustrates the processes used to diagnose disease in the clinical laboratory.

The interplay of the infectious agent (bacterial, mycotic, viral and parasitic) and the host in the development and subsequent outcome of infectious diseases is the central theme of this course. A study of immune mechanisms and disorders of the immune system is integrated into the course.

Required Course:

MMIC 6080 - MEDICAL MICROBIOLOGY. A study of the role of bacteria, fungi, viruses, and parasites in human infectious disease processes, stressing the interplay of the host and agent relationships.

DEPARTMENT OF NEUROPSYCHIATRY

PSYCHIATRY DIVISION

Professor Richard L. Weddige, M.D.
Interim Chairman
Associate Professor Arthur Ramirez, M.D.
Regional Chair (El Paso)
Associate Professor Lynda Parker, M.D.
Regional Chair (Amarillo)
Professors: Malek-Ahmadi, T. McMahon, Simonds, McGovern, Arrendondo (Lubbock); Briones (El Paso)
Associate Professors: Stuyt, Kupersmith, Taylor (Lubbock); Wilcox, Schuster (El Paso); O'Rear, Garms (Amarillo)
Assistant Professors: Hanretta, Kallepalli, Veits, Grant (Lubbock)
Faculty Associate: Aguirre (El Paso)
Instructors: Weidow (Lubbock); Baida-Fragoso (El Paso)

The psychiatry teaching program has two major objectives. The first is to prepare the student to deal with the human aspects of patient care. The patient's illness is influenced by a variety of psychological and social as well as biological factors, and the effective physician must understand them. The second major goal is to provide the student with an understanding of the field of clinical psychiatry. This includes the etiology, manifestation and treatment of the spectrum of psychiatric disorders.

The instructional approach uses lectures, videotapes, patient interviewing in small groups and participation in the care of psychiatric patients in the clinical setting. Throughout, an attempt is made to help the student integrate the biological and psychosocial knowledge necessary to an understanding of contemporary psychiatry.

Required Courses:

MPSY 6030 - INTRODUCTION TO PSYCHIATRY. This course includes an overview of normal emotional growth and development and the psychosocial aspects of illness, as well as an introduction to clinical psychopathology and therapies for psychiatric disorders.

MPSY 7095, 8061 - JUNIOR-SENIOR CLERKSHIP. The clerkship provides a comprehensive experience in clinical psychiatry. For their clinical experiences, the students are assigned to adult in-patient, out-patient, and consultation-liaison services. The clinical work is also supplemented by a series of didactic seminars and conferences in which case formulation, clinical diagnosis, and treatment planning are emphasized.

NEUROLOGY DIVISION

Professor D. Hurst, M.D.
Regional Chief (Lubbock)
Professor A. Cuetter, M.D.
Regional Chief (El Paso)
Professors: Hurst, Poduslo, Dasheiff, Homan (Lubbock)
Associate Professors: Freed (Lubbock); Buscemi, Brower, Goler (El Paso)
Assistant Professors: Denaro, Petrosian (Lubbock); Miller (El Paso)

The division of Neurology includes both adult and pediatric neurology and neurology research. The department shares responsibility for an integrated neurosciences course in the first year. The faculty also participate in the Introduction to Internal Medicine course and in the Pathology curriculum (neuropathology) in the second year. There is a one month required clinical clerkship in the fourth year. Electives are offered in Pediatric Neurology, Sleep Disorders and Electrophysiology.

Required course:

MNEU 8061 - NEUROLOGY CLERKSHIP. Involves neurologic diagnosis and management as part of the neurology team with stress on common neurological disorders. Inpatient and outpatient experiences.

DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

Professor Kathy Porter, M.D.
Chair
Professor Bobby A. Rimer, M.D.
Regional Chair (Amarillo)
Professor Joseph Sakakini, M.D.
Regional Chair (El Paso)
Professor Daniel E. McGunegle, M.D.
Associate Chair (Lubbock)
Professor Carol Bergquist, M.D. Regional Chair (Odessa)
Professors: Castracane, Hisley (Amarillo); Scragg (El Paso); Lox (Lubbock); Baldwin, Braun, Carter (Odessa)
Associate Professors: Greenberg, Harlass, Sullivan (El Paso); (Lubbock); Tarvin (Odessa)
Assistant Professors: Chandler (Amarillo); Flood-Shaffer, Reddi, Vera (El Paso); Atkinson, Boone, Canez, Hales, Phillips, Prien, and Rigsley (Lubbock); Brantley, Donovan, Mendez (Odessa)
Instructors: deRiese, Hall, Lawrence, and Puls (Amarillo)

Obstetrics and Gynecology deals with the woman as a primary care patient during her reproductive years and with those functional aberrations and diseases of the female generative tract occurring at any time during life. The course of study provides the student with a basic knowledge of the reproductive system, especially during pregnancy and childbirth. The student gains practical experience through the management of normal pregnancy, the evaluation of the status of the fetus in utero, the supervision of labor, the conduct of delivery and management of complications.

Gynecology instruction focuses on presenting the basic principles of gynecologic examination and the diagnosis and therapy of diseases of the female reproductive system. This includes the physiology of menstruation, fertility, infertility and fertility regulation, as well as gynecological disease-cytology, oncology and pathology.

Required Course:

MOBG 7094 - CLERKSHIP IN OBSTETRICS-GYNECOLOGY. A study of the treatment of female patients by the primary care practitioner. Obstetrics-gynecology spans the entire age range of womanhood and is extensively health-oriented with emphasis on prevention of illness and on surgical and obstetrical techniques. The quality of human life is emphasized.

DEPARTMENT OF OPHTHALMOLOGY AND VISUAL SCIENCES

Associate Professor David L. McCartney, M.D.
Chairman
Professors: May, Reid, Young
Associate Professor: Crosson
Assistant Professors: Abdul-Rahim, Brown, Burnstein, Matthews, Morales, Shami, Wong
Instructor: Greg

The goals of the Department of Ophthalmology and Visual Sciences are to deliver quality patient care, to perform significant research, and to provide research and clinical training opportunities for future generations of physicians.

The electrophysiology/visual psychophysics laboratory offers research opportunities to study the visual processing of adult and infant patients. The ocular cell biology laboratory is investigating factors involved in cell growth, glaucoma, and retinal degeneration. The goals of these programs are to understand the pathophysiological processes involved in various ocular disorders and to develop new therapeutic agents.

The department's fully accredited three year residency program admits three residents each year at the PGY-2 level. There are opportunities for graduate study, postdoctoral, clinical and basic research fellowships, and research sabbaticals in the department.

Required Courses:

MOPH 5010 - INTRODUCTION TO OPHTHALMOLOGY. This required lecture series, housed in both Introduction to Patient Assessment and in Introduction to Medicine, provides the basic knowledge of ophthalmology necessary for all medical specialists. The course focuses on the core curriculum developed by the American Academy of Ophthalmology. Subjects discussed include: visual acuity, glaucoma, red eye, injuries, amblyopia/strabismus, and neuro-ophthalmology.

MOPH 803B, 806A - FRESHMAN AND UPPER-CLASS CLINICAL ELECTIVES. During their clinical rotation, medical students will work closely with ophthalmology residents as well as faculty in the department's clinic, which serves a diverse patient population covering the entire range of ophthalmic pathology. Grand Rounds, regularly scheduled lectures, conferences, and visiting professors provide an excellent basis for teaching and scientific interaction.

MOPH 806C - RESEARCH ELECTIVE. Research electives are available during the summer and the regular school year on application to the research director of the department. Interested students are encouraged to apply for the department's Medical Student Summer Research Fellowship or the Jesse H. Jones Medical Student Fellowship offered through the Texas Tech University School of Medicine.

DEPARTMENT OF ORTHOPAEDIC SURGERY

Professor Eugene J. Dabezies, M.D.
Chairman
Professors: Bagg (El Paso); Janssen (Lubbock)
Associate Professors: Buchman, Rosen (El Paso);
Galanty, Slauterbeck, Stocks (Lubbock)
Instructor: Siebel (El Paso)
Faculty Associates: Carillo, Fagan (El Paso); Fuzie (Lubbock)

The primary goals of the department are to teach medical students, train physicians in the specialty of orthopaedic surgery, provide quality medical care and further medical knowledge through clinical basic research.

The department is organized along subspecialty lines to provide expertise in various aspects of clinical orthopaedics. Specialty areas include trauma, sports medicine, children's orthopaedics, low back and spine problems, cerebral palsy, hand, foot, adult reconstruction, and total joint replacement. In Lubbock, a division of orthopaedic research provides research opportunities for students and residents.

DEPARTMENT OF PATHOLOGY

Professor Dale M. Dunn, M.D.
Chairman
Associate Professor Darius A. Bowman, M.D.
Regional Chairman (El Paso)
Professors: Bradley, B. Pence, and D. Pence (Lubbock)
Associate Professors: Graham, Morgan, Tran, and Williams (Lubbock); Durdrey (El Paso)
Assistant Professors: Deol, Hoffpauir, and Kalamegham (El Paso); Debowski, Kuratko,and V. Mamlok (Lubbock)

Pathology, often called the bridge between the basic sciences and clinical medicine, is concerned with the study of the causes, progressive mechanisms and effects of disease. The teaching of laboratory medicine that is helpful in the above studies is correlated with the teaching of tissue changes that occur in the organ systems in disease processes.

The programs of the department are organized into three divisions: Anatomical pathology, Clinical pathology, and Experimental Pathophysiology. There is a combined Anatomic and Clinical Pathology Residency Program based in Lubbock. In addition, the pathology department is involved in interdepartmental teaching and participation whenever indicated.

Required Course:

MPAT 6080 - PATHOLOGY (Fall and Spring). General Pathology, Organ Systems Pathology, and Introduction to Clinical Pathology are covered. A study of the major categories of diseases and disease processes with an introduction to basic clinical laboratory procedures. Organ systems pathology is the study of specific disease states by organ system. Use of laboratory test interpretation in differential diagnosis is correlated with systems being studied where appropriate. During both semesters, small group sessions and interactive laboratories will be utilized as a teaching mechanism for students enrolled in the Pathology course.

DEPARTMENT OF PEDIATRICS

Professor Richard Lampe, M.D.
Chairman
Professor Tribhawan S. Vats, M.D.
Regional Chairman (Amarillo)
Professor Gilbert A. Handal, M.D.
Regional Chairman (El Paso)
Associate Professor Alfred N. Karickhoff, M.D.
Regional Chairman (Odessa)
Professors: Hammer, Johnson, T. Myers (Amarillo); Jesurun, Schydlower (El Paso); Chappell, Gururaj, Holmes**, Lampe, Marsh, Joon Park, Varma (Lubbock)
Associate Professors: Andrew, Boger, Chuachingco, Hale, Hammer, M. Myers, Naqvi, Sheehan (Amarillo); Foley, Gallo, Levin, Logvinoff, Swaney, S. Ting (El Paso); Bacchi, Bourgeois, Craig, Fang**, Garcia**, George**, Goldthorn*, Hurst*, Iacuone**, Lacey*, Law**, Oblender, Romano, E. Rosenberg, R. Rosenberg, Sang, Waagner, Watts (Lubbock); Bennett, Karickhoff, Lane, Park, Rogers, Talbert, Vailas (Odessa)
Assistant Professors: Ammar, Biskinis, Muthali**, Pena, Schneider (Amarillo); Chamberlin, Christenson, Masih, Salloum, Schuster, Shirsat, B. Ting, Tiu (El Paso); Camp, Colon, Douthit, Galanty*, Higgins**, Klepper**, R. Mamlok**, V. Mamlok*, Narendran**, O'Neill**, Perez, Riojas**(Lubbock); Bahatia, Ramos (Odessa)
Instructor: Blanc (El Paso)
* - Joint Appointment
**- Part-Time Clinical Appointment

The course of study in the Department of Pediatrics provides each student with a closely supervised learning experience in the care of infants and children, both ill and well. Students observe and participate in diagnostic and patient care activities concerned with premature and term newborns, growth and developmental processes, infectious diseases, and a variety of Pediatric subspecialties. There is emphasis on preventive as well as therapeutic medicine.

Electives for senior students are available in adolescent medicine, ambulatory/outreach pediatrics, cardiology, child abuse and neglect, critical care, developmental and behavioral pediatrics, endocrinology, general inpatient pediatrics, Gastroenterology, genetics, infectious diseases, neonatology, child neurology, and pulmonology (at Lubbock); cardiology, developmental and behavioral pediatrics, endocrinology, general pediatrics, infectious diseases, neonatology, and pulmonology (at El Paso); developmental and behavioral pediatrics, endocrinology, general pediatrics, hematology/oncology, neonatology, and clinical pharmacology (at Amarillo); general pediatrics and neonatology (at Odessa).

An elective course, "Introduction to Child Health Care," is available to freshman students. This provides an introduction to the care of infants as well as a broad overview of preventive pediatrics. Basic principles of physical diagnosis are taught during the sophomore year as an integral component of the Introduction to Patient Assessment.

Required Course:

MPED 7093 - CLERKSHIP IN PEDIATRICS. During the clerkship students rotate through the pediatric inpatient, ambulatory care and new nursery services, participating in the evaluation and management of children with a variety of problems. Emphasis is placed on a comprehensive approach to total child, including his/her family and environment. Learning is augmented by a lecture series and various case conferences coupled with close faculty support and supervision.

DEPARTMENT OF PHARMACOLOGY

Professor Louis A. Chiodo, Ph.D.
Chairman
Professors: Carroll, Kendall*, Lombardini, Pirch, Tenner
Associate Professors: Casner*, Crosson*, Freeman, Hale*, K. McMahon, Miller, Syapin, H. Strahlendorf
Assistant Professors: Blanton, Machu, Reigel, Roghani
*Joint Appointment

Pharmacology is the biomedical science concerned with the interactions of chemicals with living systems and their constituent parts. The emphasis in the Doctor of Medicine program is on the study of chemicals in their roles as therapeutic agents used in the prevention, alleviation, treatment, or diagnosis of human disease, and as toxic agents producing undesirable effects. Clinical relevance is stressed both in the lecture material and in a complementary series of clinical conferences.

Required Course:

MPHA 6060 - MEDICAL PHARMACOLOGY. A study of chemicals in their role as therapeutic agents used in the prevention, alleviation, treatment, or diagnosis of human disease, and as toxic agents producing undesirable effects.

Elective Courses:

MPHA 806A - PHARMACOLOGY RESEARCH. A laboratory research elective is offered in Lubbock for medical students desiring a research experience in pharmacology. It is intended that the student will perform laboratory research under supervision of an experienced faculty investigator in one or more of the following areas: autonomic, cardiovascular, neurochemical, biochemical, or molecular pharmacology; alcohol toxicity; neuropharmacology; or neuropsychopharmacology.

MPHA 806B - PHARMACOLOGY INDEPENDENT STUDY. An independent study elective is offered in Lubbock and El Paso for junior and senior medical students desiring an in-depth study of a specific area in basic or clinical pharmacology under the guidance of a faculty member. The purpose of the study elective is to allow the student to comprehend more fully the rational basis for drug selection and use and to appreciate the potential hazards associated with drug therapy in one or more of the following areas: autonomic, cardiovascular, neurochemical, biochemical, or molecular pharmacology; chemotherapy; neuropharmacology; or neuropsychopharmacology.

DEPARTMENT OF PHYSIOLOGY

Professor John Orem, M.D., Ph.D.
Chairman
Professors: D. Davies, J. Heavner*, H. Janssen*, N. Kurtzman*, L. Lutherer, J. McGrath, S. Sabatini, and D. Wesson
Associate Professors: M. Laski*, R. Nathan, J. Fowler, T. Pressley, and J. Strahlendorf
Assistant Professor: S. Gyorke, A. Neely, R. Martinez-Zaguilan, and N. Sarvazya
*Joint Appointment

The Department of Physiology in the School of Medicine offers educational and research programs for students working for professional degrees in medicine and related health sciences, and advanced degrees in physiology.

Required Courses:

MPHY 5090 - MEDICAL PHYSIOLOGY. A study of human physiology with major emphasis on body controlling systems and their interrelations. Pathophysiological mechanisms also are stressed.

DEPARTMENT OF RADIOLOGY

Professor Glenn H. Roberson, M.D.
Chairman
Professor Lloyd K. Mark, M.D.
Regional Chairman (El Paso)
Professors: Blackwell (Lubbock), Gainer, Uhrig (El Paso)
Associate Professors: Cheng, Bravo-Large, Shieh (Lubbock)
Assistant Professors: Bessen, Blakely, Brotman, Naylor, Pawluk, Steinbaum, Thomas
Clinical Instructor: White

The Department of Radiology is actively engaged in undergraduate and postgraduate radiological education. Radiology faculty presentations are given in Anatomy and are a regular part of the course in Pathology and the Introduction to Clinical Medicine. A one-month elective is offered to the undergraduate medical students in their clinical years. As a prerequisite, at least one rotation must have been taken in either Internal Medicine or Surgery.

The Department of Radiology includes the following major specialty areas, utilizing diagnostic radiology, fluoroscopy, computerized tomography, magnetic resonance, nuclear medicine (SPECT), antiographic, radiation therapy, and ultrasound technology.

1. Abdominal imaging and intervention.
2. Emergency/trauma radiology.
3. General diagnostic radiology.
4. Mammography.
5. Neuroradiology.
6. Orthopaedic imaging and intervention.
7. Pediatric radiology.
8. Pulmonary and cardiac imaging and intervention.
9. Radiation Oncology.
10. Teleradiology.

DEPARTMENT OF SURGERY

Associate Professor John Griswold, M.D.
Interim Chairman
Professor Dennis Dove, M.D.
Regional Chairman (Amarillo)
Professor Edward C. Saltstein, M.D.
Regional Chairman (El Paso)
Professors: Behal, Illner, Jackson, Kosloske, Mittemeyer, Walsh (Lubbock); Feola (Amarillo)
Associate Professors: Goldthorn, Griswold, Hagedorn, Lacey, O'Connor, Sedler (Lubbock); Diaz-Ball, Dougherty, Dulaney (El Paso)
Assistant Professors: Akhter, D'Alise (Lubbock); Grieshop, Kwong (El Paso)
Instructors: Deeb, Norkiewicz (Lubbock)
Research Assistant Professors: Simoni (Lubbock)

Instructional programs are designed to acquaint the student with the clinical discipline of surgery and the principles and techniques used in management of surgical disease and injury. The introduction to surgery provided in the junior clerkship reinforces an understanding of the pathophysiology of surgical disease, the techniques of arriving at judgmental decisions in management, pre- and post-operative care and emergency care. The student learns as a participating member of the surgical team. Teaching sessions include ward rounds, a lecture series, daily reviews of patients with a faculty member and attending conferences. Senior clerkships are provided in all surgical specialties as electives.

Divisions within the department include (Lubbock):

Cardiovascular and Thoracic Surgery — This division provides a series of lectures on the fundamentals of cardiovascular and thoracic disease and management during the junior clerkship and a senior elective with the clerk functioning with a preceptor learning techniques of diagnosis and surgical management of congenital and acquired disease.

Oncology — This division provides a senior elective which includes experience participating in the management of the cancer patient using a multimodal, multidisciplinary approach to the treatment of the disease.

Oral Surgery — This division provides education and patient care services on call.

Organ Transplant — This division will introduce students to this tertiary surgical specialty through participation in all aspects of the care of organ transplant patients, i.e., organ donor education, transport outpatient clinic, and operating room.

Otorhinolaryngology — This division provides instruction to freshmen, sophomores and juniors and a senior elective in the methodology of examination and use of otorhinolaryngology diagnostic instruments and management of disease and trauma.

Pediatric Surgery — This division provides a series of lectures to junior surgical clerks, residents and faculty on the management of surgical diseases of infants, children and adolescents and offers a senior elective.

Plastic and Reconstructive Surgery — This division presents principles of plastic and reconstructive surgery at the freshman and junior levels and offers senior elective experiences as preceptorships with faculty or at rotations, conferences and rounds of the trauma service unit.

Surgical Research Laboratories — This division facilitates basic and applied research by surgical faculty and offers research electives to senior medical students and residents. The lab assists in solving patient care problems arising on the surgical wards and seeks new and improved methods of patient management.

Trauma and Burns — This division is concerned with the physiologic and metabolic response of the body to severe injury. Offerings include a senior elective on resuscitation, evaluation, triage and initial management of injured patients, and the supportive management of severely traumatized patients during the most acute phase of care. Service includes emergency department rotations, conferences and rounds of the trauma service unit.

Urology — This division offers lectures during the freshman and junior years and a senior elective including instruction in diagnostic steps, management of common urological disorders and basic pathological and abnormal physiological changes.

Required Courses:

MSUR 7091 - CLERKSHIP IN GENERAL SURGERY. An introduction to the pathophysiology of surgical diseases and the principles and techniques used in their diagnosis and management. Course includes participation in pre- and post-operative patient care, operating room and clinic experience as a member of a team of the surgical faculty.

INTERDISCIPLINARY COURSES

The following are interdisciplinary courses taught in Years One and Two of the medical school curriculum.

MPSY 5012 - THE PHYSICIAN IN SOCIETY. An introduction to the practice of medicine and the American health care system from economic, socio-cultural, and professional perspectives.

MFAM 5022 - CONCEPTS IN COMMUNITY AND AMBULATORY CARE. An introduction into the clinical aspects of health care that emphasize the physician-patient interaction, health history and assessment, and introductory examination skills.

MIDS 5080 - INTRODUCTION TO NEUROSCIENCES. A detailed study of the nervous system with an examination of both gross and fine structure as well as function from the cellular through the behavioral levels.

MFAM 6061 - PATIENT CARE: AN INTEGRATED APPROACH. A more detailed introduction to patient assessment that emphasizes the history and physical examination, application of epidemiological and statistical analysis to patient care, and ethical issues in the physician-patient relationship.

GRADUATE SCHOOL OF BIOMEDICAL SCIENCES

Development of a strong program of graduate education in the basic biomedical and related health sciences is one of the responsibilities and goals of the Texas Tech University Health Sciences Center School of Medicine. Present-day medicine cannot exist outside the academic framework and intellectual discipline which the biological, chemical, and medical sciences provide. Graduate training in these areas is an integral component of the overall program of the Health Sciences Center, is provided by the Graduate School of Biomedical Sciences.

Opportunities are offered for study and research leading to the Master of Science and Doctor of Philosophy degrees in ANATOMY, MEDICAL BIOCHEMISTRY, MEDICAL MICROBIOLOGY, PHARMACOLOGY, AND PHYSIOLOGY. Individual program descriptions can be found within the specific department or program sections in this catalog.

Students interested in pursuing a career in academic medicine as a physician-scientist may apply simultaneously in the School of Medicine and the Graduate School of Biomedical Sciences. The M.D. - Ph.D. program permits a student to complete the requirements of both the degrees in one of the approved graduate programs. A limited number of exceptionally qualified M.D.- Ph.D. students will be designated as Medical Scientist Scholars. Students in the Medical Scientists Training Program will receive stipend throughout the graduate portion of the program, tuition scholarships for both the medical and graduate portions of the program, and health insurance for the duration of the stipend. This program is designed to be completed in six to seven years and will provide the student with rigorous training in both clinical medicine and biomedical research. Students interested in this program should so indicate on the application forms they simultaneously submit to both the TTUHSC School of Medicine and the Graduate School of Biomedical Sciences.

The graduate courses listed in this section are available, with the consent of the course instructor and the Dean of the Graduate School of Biomedical Sciences, to graduate students at Texas Tech University or other qualified applicants as a graduate interdisciplinary student (GIDS) for one semester/one course. Application must be made to the Graduate School of Biomedical Sciences, the application fee ($25 for U.S. citizens and $50 for international students) paid, and registration accomplished at TTUHSC.

Further information about graduate programs offered through the Health Sciences Center Graduate School of Biomedical Sciences may be obtained by contacting: The Graduate School of Biomedical Sciences Texas Tech University Health Sciences Center Lubbock, TX 79430 Phone: (806) 743-2556 or 1-800-528-5391 Fax: (806) 743-2656 e-mail: ACAGSBS@TTUHSC.EDU

Programs are subject to change, depending on availability of resources and educational goals.

"Texas Tech University Health Sciences Center reserves the right, without notice in this catalog, to change, amend, add to, or otherwise alter any or all fees, rates or other changes set fourth herein by action of the Board of Regents of Texas Tech University or the Texas State Legislature as the case may be."

DEPARTMENT OF CELL BIOLOGY AND BIOCHEMISTRY

Professor Harry M. Weitlauf, M.D.
Chair
Professors: Behal, Chilton, Everse, Faust, Hutson, Morrow, Norman, Phillips, Poduslo, Reid, and Stocco
Associate Professors: Beale, Coates, Khan, Little, Pelley, B. Pence, Sridhara, and Whelly
Assistant Professors: Cornwall, Coue, Hardy, Lee, MacDonald, Pfarr, Ravnik, Webster, and Williams
Clinical Associate Professor: Wright

This department offers study in the following graduate degree programs: ANATOMY, Master of Science, Doctor of Philosophy and MEDICAL BIOCHEMISTRY, Master of Science, Doctor of Philosophy.

ANATOMY

The ANATOMY program reflects modern emphasis on cell and developmental biology and is designed to prepare students for research and teaching careers in the life sciences. Students with bachelors' degrees in any of the biological sciences, chemistry, or biochemistry are encouraged to apply. Recommended undergraduate studies include courses in cell biology, developmental biology, organic chemistry, biochemistry, genetics, calculus, and general physics. Students who do not meet minimum requirements may correct them by taking leveling courses (or exams) or by successfully completing graduate-level courses that require the recommended undergraduate courses as prerequisites.

Students will develop proficiency in four general areas during their first two years in the program: cell structure and function, the cell cycle, cellular interactions, and mechanisms of cellular differentiation. The student will become competent in these areas by successfully completing a prescribed core block of courses offered by this department.

During the first year in the program, students will rotate through at least three different laboratories to broaden their education and research experience and to help them identify a field of specialization for their dissertation research. Current areas of faculty interest include signaling between interacting cells; growth defects in neoplastic cells; neuropeptides in the brain; embryo implantation; molecular mechanisms of tissue-specific gene expression; reproductive biology; and development and regeneration of the nervous system.

The central element in a student's graduate education is learning to be a scientist by completing a dissertation project. Upon completion of this project, the student must defend the work in an oral examination administered by the student's committee and present the work in a public seminar.

A minimum of 60 semester hours, excluding the doctoral dissertation, is required. Courses marked by an asterisk are classical anatomy courses for students in health

care fields. For more information, contact Dr. Jim Hutson, the anatomy program advisor, at (806) 743-2712.

Courses for Anatomy. (GANM)

5112, 5212, 5312. Laboratory Methods (1:0:2; 2:0:4; 3:0:6). Taken as (1) a hands-on introduction to the laboratories in which a student may wish to do dissertation research or (2) after a student is well established in his or her dissertation research, additional rotations can be done to gain expertise in techniques applicable to the student's research but not available in the faculty advisor's laboratory. Requires permission of the faculty member. May be repeated if different methods are covered for each registration.

5113, 5213, 5313. Selected Topics in Cell and Developmental Biology (1:1:0; 2:2:0; 3:3:0). Topics vary from semester to semester and reflect the research interests of the faculty. Recent offerings have included oncogenes and molecular biology of hormone action. May be repeated provided that different topics are covered for each registration.

5302. The Cell Cycle (3:3:0). Prerequisite: Consent of instructor. Examination of DNA replication and repair, meiosis and recombination, and mitosis and the genetics of cell cycle control.

5309. Biology of Reproduction (3:3:l). The various aspects of biological reproduction with an emphasis on human problems. The reproductive process will be taught from union of the gametes to the delivered fetus. Morphology will be stressed.

5310. Histology (3:2:4). Correlation of the structural organization with functional specializations of human tissues and organs; clinical correlations are also an integral part. Since this is the histology course offered in the first-year medical curriculum, departmental approval prior to registration is required.

5311. Embryology (3:3:0). This course deals with the development of the human embryo from fertilization to parturition. Clinical correlations are strongly emphasized. Since this is the embryology course offered in the first-year medical curriculum, departmental approval prior to registration is required.

***5321.** Advanced Gross Anatomy (3:0:3). An in-depth gross anatomical study devoted to one of the following areas of emphasis: topographical anatomy, head and neck, thorax and abdomen, pelvis and perineum, extremities and back, depending on the student's needs. The course may be repeated for credit if another area of emphasis is selected.

***5330.** Advanced Anatomy for Sports Medicine (3:2:2). Gross anatomy designed for sports medicine with emphasis on body parts most susceptible to athletic injuries. 5606. Mechanisms of Cellular Differentiation (6:6:0). Prerequisite: Consent of instructor. Topics include the determination of cell fate in invertebrates and vertebrates, lineage versus environmental controls, multipotential stem cells and the regulation of cell type-specific gene expression.

***5611.** Gross Anatomy (6:2:10). A highly integrated introductory course of anatomical study (including human prosection) which embodies the gross morphology of the body and coordinates it with the clinical, developmental, and microscopic aspects of the human body.

6000. Master's Thesis (V1-12). 6704. Cell Function & Regulation (7:7:0). Topics include structure and function of membranes and organelles, mechanisms of transcription and translation, and regulation of cellular processes including both endocrine and nonendocrine aspects. (To be dual listed with GBCH 6704.) 7000. Research (V1-12). 7101. Seminar (1:1:0). The student will attend and participate in departmental seminars. 8000. Doctoral dissertation (V1-12).

MEDICAL BIOCHEMISTRY

The MEDICAL BIOCHEMISTRY program is designed to prepare students for research and teaching careers in biochemistry and molecular biology as related to the medical and life sciences. Admission to the program requires prior course work in mathematics, general physics, organic chemistry, analytical chemistry, and biological science. Students with deficiencies in any of these areas may be conditionally admitted pending successful completion of leveling courses prescribed by the department. Students are required to take GBCH 5921, 6122, 6322, 6522, and 6533 or their equivalents as determined by the department. In addition, students are urged to take or to have successfully completed courses in physical chemistry, statistics, and computer programming. GBCH 5921 is open only to students requiring this course as a part of a regular graduate degree program, and enrollment requires the permission of both the department chairperson and the Dean for Graduate School of Biomedical Sciences.

Generally within 12 months after enrollment in the program, each student will take a preliminary examination in general biochemistry. After a major portion of the required course work has been completed, the student must pass a qualifying examination which consists of two parts: a written portion in the form of an original research proposition designed to demonstrate the student's comprehension of some field of study related to biochemistry, ability to develop hypotheses, and competence in the design and conduct of promising and significant experiments; and an oral portion in which the student is expected to defend the proposition and demonstrate an understanding of the fundamental concepts and principles of biochemistry which relate to the proposition.

During the first year in the program, students will rotate through at least three different laboratories to broaden their education and research experience and to help them identify a field of specialization for their dissertation research. Major areas of current research include studies of the regulation of gene expression in a variety of eukaryotic tissues, biochemistry of development, mechanisms of hormone action, biochemistry of neoplasia, genetics of somatic cells in culture, biochemistry of membranes, mechanisms of enzyme action, and recombinant DNA.

Information covering specific requirements for degree programs is contained in the departmental Graduate Student Handbook. For more information, contact Dr. Charles Faust, the Medical Biochemistry program advisor at (806) 743-2031.

Courses for Medical Biochemistry. (GBCH)

5621. General Biochemistry (6:6:0). Human life processes at the molecular level with emphasis on biomedical homeostasis and control mechanisms. 5921. Medical Biochemistry (9:9:0). Prerequisite: CHEM 3305, 3306, or equivalent. Human life

processes at the molecular level with emphasis on biochemical homeostasis and control mechanisms. These principles are examined through clinical correlations.

6000. Master's Thesis (V1-6).

6101. Biochemistry Conference (1:1:0). Informal conferences between faculty and students considering topics of current interest in biochemistry not normally included in other courses. Literature search, evaluation, organization, writing, and oral presentation by the student are emphasized. Different topic each semester. May be repeated for credit.

6121. History of Biochemistry (1:1:0). Highlights in the advancement of biochemical knowledge will be discussed.

6122. Medical Biochemistry Problem Solving (1:1:0). Concurrent course to GBCH 5921 to help students develop problem solving skills. Discussion of solutions to assigned problems with topics correlated to lectures in GBCH 5921.

6127. Seminar in Cell Biology (1:1:0). Prerequisite: Consent of instructor. May be repeated. Presentation of current research topics in the genetics and molecular biology of eukaryotic cells, and related areas; onocogenesis, differentiation, aging.

6135, 6235, 6335, 6535. Topics in Biochemistry (1:1:0; 2:2:0, 3:3:0, 5:5:0). Prerequisite: Consent of instructor. Lectures in specific areas of biochemistry not normally included in other courses. May be repeated for credit with change of content.

6221. Human Intermediary Metabolism and Its Regulation (2:2:0). Prerequisite: GBCH 5921, CHEM 4303, 4306, 4307, or equivalent. Consideration of normal and abnormal human intermediary metabolism with major emphasis on biosynthetic and catabolic pathways and on modulation and control.

6320. Clinical Biochemistry (3:3:0). Prerequisite: GBCH 5921, CHEM 4303, 4306, 4307, or equivalent. A study of clinical chemistry with emphasis on the interpretation of clinical laboratory data and concepts of laboratory-assisted diagnosis of human disease.

6426. Advanced Human Genetics (4:4:0). Prerequisites: A course in genetics and consent of instructor. Detailed consideration of population genetics, cytogenetics, molecular biology, and biochemistry as related to human heredity. Includes one hour discussion of papers from current literature.

6522. Molecular Biology of Eukaryotes: Nucleic Acids (5:5:0). Prerequisite: GBCH 5921 or equivalent and consent of instructor. An in-depth study of nucleic acid biosynthesis and gene expression and its control in eukaryotes, as well as the study and application of the principles of genetic engineering to nucleic acid structure and molecular biology.

6533. Molecular Biology of Eukaryotes: Proteins (5:5:0). Prerequisite: GBCH 5921 or equivalent and consent of instructor. An in-depth description of the process of protein biosynthesis, degradation and regulation in eukaryotes, as well as the study of physio-chemical methods used to characterize proteins and their molecular structure.

6704. Cell Function & Regulation (7:7:0). Topics include structure and function of membranes and organelles, mechanisms of transcription and translation, and regulation of cellular processes including both endocrine and nonendocrine aspects. (To be dual listed with GANM 6704.)

7000. Research (V1-12). 7101. Biochemistry Seminar (1:1:0). 8000. Doctor's Dissertation (V1-12). 9000. Postdoctoral Research (V1-12).

DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY

Professor LaJean Chaffin, Ph.D.
Interim Chair
Professors: Chaffin, Hentges, Lefkowitz, Pence, and Straus
Associate Professors: Fralick, Griswold, Hamood, Joys, Ritzi, and Rolfe

This department offers study in the following graduate degree programs: MEDICAL MICROBIOLOGY, Master of Science, Doctor of Philosophy. The course work and information presented below describe those aspects of the programs of particular interest to students choosing to study and conduct research in the areas of medical microbiology which are traditionally found in a medical center.

Students seeking information concerning admission to the graduate program in medical microbiology, training and research opportunities, or teaching and research assistantships in the Department of Microbiology and Immunology should contact the chairperson of the department.

COURSES IN MICROBIOLOGY. (MIB)

5181, 5281, 5381. Selected Topics in Microbiology (1:1:0; 2:2:0; 3:3:0). Prerequisite: Consent of instructor. Specific areas in microbiology and immunology or related research not normally included in other sources. May be repeated for credit with change in content.

5399. Introduction to Microbiology Research (3:0:3). Beginning students. Exposure to experimental design, research methodology and data analysis in the laboratories of three faculty members.

6000. Master's Thesis (V1-12).

6201. Medical Parasitology (2:1:1). An overview of important protozoan helminth and arthropod infections and vectors of disease.

6237. Medical Mycology for Graduate Students (2:2:0). Prerequisite: Medical or pathogenic microbiology or consent of instructor. A study of the biology of pathogenic fungi and human mycoses.

6323. Genetics and Molecular Biology of Procaryotes (3:3:0). Prerequisite: Biochemistry, general microbiology. Current concepts on the molecular biology and genetics of procaryotes with emphasis on regulation of gene expression.

6324. The Molecular Biology of Pathogenic Bacteria (3:3:0). Prerequisite: Medical microbiology, biochemistry. Lectures and discussions concerning the molecular analysis of mechanisms by which pathogenic bacteria produce infections. The regulation and expressions of virulence factors are emphasized.

6325. The Biology of Animal Viruses (3:3:0). Prerequisite: General biochemistry and general microbiology. Emphasis will be placed on DNA and RNA tumor viruses, tumor suppressor genes and human immunodeficiency virus.

6329. Advances in Immunology (3:3:0). Prerequisite: GMIB 6931 or consent of instructor. A discussion of current knowledge of the immune system with emphasis on molecular and cellular interactions.

6335. The Pathogenesis of Infectious Disease (3:3:0). Prerequisite: Medical or pathogenic microbiology or consent of instructor. A study of the processes by which microorganisms produce disease in humans and hoe the host responds

6931. Medical Microbiology (9:8:1). A study of bacteria, fungi, parasites, and viruses and how they function to produce diseases in humans. The response of the body to invasion by these microorganisms is also discussed.

7000. Research (V1-12).

7101. Microbiology Seminar (1:1:0).

8000. Doctor's Dissertation (V1-12).

DEPARTMENT OF PHARMACOLOGY

Professor Louis A. Chiodo, Ph.D.
Chairperson
Professors: Carroll, Lombardini, Pirch, and Tenner
Associate Professors: Crosson, Freeman, K. McMahon, Miller, H. Strahlendorf, and Syapin
Assistant Professors: Blanton, Machu, Reigel, and Roghani

This department offers study in the following graduate degree programs: PHARMACOLOGY, Master of Science and Doctor of Philosophy. The objective is to prepare students for careers in research and teaching. The faculty of the program seeks to foster a creative and productive research atmosphere, to provide encouragement and positive challenge, and to equip students with the intellectual tools they will need to be effective teachers and investigators. Specialized research training is available in the areas of biochemical pharmacology, calcium imaging, circadian pharmacology, autonomic pharmacology, cardiovascular pharmacology, neuropharmacology, and molecular pharmacology.

Courses in Pharmacology (GPHM)

5101, 5201, 5301. Topics in Pharmacology (1:1:0; 2:2:0; 3:3:0). Prerequisite: Consent of instructor. Specific areas of Pharmacology not normally included in other courses. May be repeated for credit with change in content.

5303. Principles of Pharmacology (3:3:0). Prerequisite: Biochemistry and physiology or consent of instructor. A study of the principles and theories of pharmacokinetics and pharmacodynamics of chemicals in relationship to dose and time. The course will consist of lectures, discussions, and oral presentations of original papers by the class and is oriented for both pharmacology and nonpharmacology majors.

5326. Pharmacology of the Autonomic Nervous System (3:3:0). Prerequisite: GBCH 5921, GPHY 5803, GPHM 5613 or equivalent. A conceptual study of drugs which alter the function of the autonomic nervous system. Emphasis will be on mechanism by which drugs affect transmitter synthesis, release, uptake, and metabolism as well as receptor function.

5336. Molecular and Cellular Pharmacology (3:3:0). Prerequisite: Consent of instructor. Topic areas will include receptors, second messenger systems, ion transport, pre-synaptic cellular biology, and anti-AIDS treatments. The course will consist of lectures and student discussions of the topics listed above.

5337. Neuropsychopharmacology (3:3:0). Prerequisite: Consent of instructor. A structured in-depth study of specific topics concerning neurochemical pharmacology, behavioral pharmacology, and neuropsychopharmacology. Topics to be studies will vary each semester. The course will consist of lectures, discussions, and oral presentations of original papers by the class.

5425. Techniques in Pharmacological Research (4:2:6). Prerequisite: GBCH 5921, GPHY 5803, or equivalent. A lecture and laboratory course designed to provide an introduction to and hands-on experience with standard experimental techniques used in pharmacological research.

5613. Pharmacology (6:5:1). A study of pharmacology with emphasis on mechanisms of drug action, drug interactions, and therapeutics.

6000. Master's Thesis (V1-12).

7000. Research (V-1-12).

7101. Pharmacology Seminar (1:1:0).

8000. Doctor's Dissertation (V1-12).

DEPARTMENT OF PHYSIOLOGY

Professor John Orem, M.D., Ph.D.
Chairperson
Professors: Davies, Heavner, Janssen, Kurtzman, Lutherer, McGrath, Sabatini, and Wesson
Associate Professors: Fowler, Laski, Nathan, Pressley, and J. Strahlendorf
Assistant Professor: Gyorke, Martinez-Zaguilan, Neely, and Sarvazyan

This department offers study in the following graduate degree programs: PHYSIOLOGY, Master of Science, Doctor of Philosophy. The program is designed primarily to train persons for careers in biomedical research and/or teaching in medical institutions or industry, but can accommodate those interested in alternative careers in physiology. Faculty research programs are diverse, encompassing the general areas of systemic, cardiovasculary, renal, and neurophysiology. Specific areas include membrane biohysics, Ca++ channels and other membrane transporters, pH and Ca++ homeostasis, Na+/K+ ATPase, excitation-contraction coupling, oxygen free radicals and cell injury, apoptosis, neuronal protective mechanisms, particle toxicology, cerebral blood flow, hypertension, shock, sleep and control of respiratory and cardiovascular function.

Applicants should have a demonstrated interest in research and preferably have identified an area for their dissertation research. Assistantships are granted only to students in the Ph.D. program. All candidates for graduate degrees who hold assistantships must fulfill certain requirements while appointed as assistants.

GPHY 5803 is normally a prerequisite for all courses in or above the 6000 level bu may be waived for students in other programs with approval of the instructor. Enrollment in GPHY 5803 is limited to students admitted to degree programs and requires approval by the thesis director and the department chairperson.

Courses in Physiology (GPHY)

5450. The Biologic Basis for Disease: Paradigms for the 21st Century (4:3:0). Prerequisite: GPHY 5502 or consent of instructor. Survey of major diseases, their pathophysiology and relevant clinical manifestations. Designed to integrate mechanisms of molecular and organ physiology with the pathogenesis of human disease. For graduate students in degree granting programs in the health sciences and biology.

5502. Human Physiology: Cellular and Integrated Mechanisms (4:4:0). Prerequisite: College biology and consent of instructor. An introduction to the physiology of mammalian organ systems placing emphasis on the human. Subject matter includes membrane transport, muscle, cardiovascular, respiratory, renal, water and electrolyte balance, gastrointestinal, and endocrine physiology as well as neurophysiology.

5603. Advanced Physiology (6:6:3). A study in human physiology emphasizing body-controlling systems and their interrelationships. Pathological mechanisms are also stressed.

5803. Medical Physiology (8:7:4). A study in human physiology emphasizing body-controlling systems and their interrelationships. Pathological mechanisms are also stressed.

6000. Master's Thesis (V1-12).

6105, 6205, 6305. Topics in Physiology (1:1:0; 2:2:0; 3:3:0). Prerequisite: Consent of instructor. Specific areas of physiology not normally included in other courses (renal, neurophysiology, environmental, cardiovascular). May be repeated for credit with change in content.

6300. Advanced Neurophysiology I: Cellular and Molecular Neuroscience (3:3:0). Prerequisite: GPHY 5803 or consent of instructor. Discussion of the structure and function of ion channels, neurotransmitters, and the mechanisms of synaptic transmission.

6304. Health Effects of Environmental Pollutants (3:3:0). Prerequisite: College biology and chemistry and consent of instructor. The physiological changes and potential health effects associated with energy usage and development. Emphasis is on understanding mechanisms of actions, effects of extreme environmental and occupational conditions (i.e., altitude, temperature, pollution), and risk evaluation. Offered even years only.

6309. Advanced Neurophysiology II (3:3:0). Prerequisite: GPHY 5803 and GIDN 5910 with consent of instructor. Addresses neural systems. Topics will be from the following: sensory-motor systems; control of respiration and the cardiovascular system; sleep and wakefulness.

6310. Advanced Cardiovascular Physiology (3:3:0). Prerequisite: GPHY 5803 and consent of instructor. Advanced level coverage of topics in cardiovascular physiology with much material being covered in reviews of the research literature.

6311. Cellular and Molecular Phsiology (3:3:0). Prerequisite: GIDN 5910 or GPHY 5502 or consent of instructor. The study of the structure and function of ion channels and active transporters, excitation- contraction coupling, and mechanisms of cell damage and death.

6314. Membrane Biophysics (3:3:0). Students are introduced to the mechanisms of ion transport through membrane channels; models of membrane excitability; molecular structures of ion channels and their physiological functions.

6315. Physiology of Neuroeffector Systems (3:3:0). A consideration of adrenergic, cholinergic, histaminic, and serotonin receptor systems and their physiological applications. Offered summers even years only.

6341. Renal Physiology (3:3:0). Recent advances in the normal and pathophysiological mechanisms of the kidney are discussed and correlated.

7000. Research (V1-12).

7101. Physiology Seminar (1:1:0). This weekly seminar series provides invited speakers from this and other departments as well as other universities and laboratories with the opportunity to present their current research in some area of physiology.

7102. Readings in Physiology (1:1:0). Students review literature on special topics of research. (Students may be assigned or may select these topics). May be repeated for credit.

7103. Supervised Teaching in Physiology (1:1:0). Prerequisite: GPHY 5803. Supervised teaching experience including leading laboratory groups and small-group discussions and presenting lectures in some departmental courses (all under faculty supervision).

8000. Doctor's Dissertation (V1-12).

GRADUATE INTERDISCIPLINARY COURSES IN THE HEALTH SCIENCES CENTER GRADUATE SCHOOL OF BIOMEDICAL SCIENCES

In addition to the courses listed by department, the following courses are available in the areas indicated.

Interdisciplinary Courses in Health Communications (GIHC)

5315. Health Information Research (3:3:0). Critical examination and synthesis of past and ongoing research on the health information process including Internet training.

5319. Seminar in Current Topics of Information Sciences (3:3:0). This course will vary each semester emphasizing information science topics including Internet training.

Interdisciplinary Courses in Health Organization Management (GIHM)

5306. HOM I: Medical Aspects (3:3:0). Prerequisite: MGT 5370 or consent of instructor. Focuses on the implications for the management of health care organizations of medical issues such as the natural history of disease, epidemiology and health policies. (MGT 5306)

5307. HOM II: Ambulatory and Other Health Organizations (3:3:0). Prerequisite: GIHM 5306 or consent of instructor. Examines fundamental and contemporary issues in the organization and management of ambulatory and other health care organizations. (MGT 5307)

5308. HOM III: Group Practice and Integrated Delivery Systems (3:3:0). Prerequisite: GIHM 5307 or consent of instructor. An organization-based view of the health care system emphasizing the provision of comprehensive health care to populations via medical group practices and integrated delivery systems. (MGT 5308)

5309. HOM IV: Contemporary Issues (3:3:0). Prerequisite: GIHM 5308 or consent of instructor. Analyzes and evaluates selected contemporary problems, issues, and trends in organized health care delivery. (MGT 5309)

7000. Research (V1-12).

Interdisciplinary Courses in Neuroscience (GIDN)

5910. Integrated Neurosciences (9:8:1). This cooperative, interdepartmental effort offers a detailed study of the nervous system. Students examine both gross and fine structure and function from the subcellular through the behavioral level.

Interdisciplinary Courses in Preventive Medicine. (GIPM)

6303. Principles of Epidemiology (3:3:0). This course considers the variety, behavior, and distribution of both infectious and noninfectious diseases in populations. It will show how an understanding of the etiology, transmission and pathogenesis of disease can lead to methods of disease prevention. Emphasis will be placed on the principles and methods of epidemiologic investigation. Arranged.

6304. Topics in Community Health (3:3:0). This course will consider various topics in epidemiology, preventive medicine, and community health not normally included in other courses. Emphasis on the interactions of various agencies in the community to abate hazards and promote health. May be repeated for credit with change in content. Arranged.

FACULTY

Abbas, Mujahed, MD; 1987, Damascus University, Assistant Professor, Internal Medicine

Abdul-Rahim, Aziz, MD; 1983, University of Virginia School of Medicine, Assistant Professor, Ophthalmology

Abedin, Zainul, MD; 1970, Nagpur University Medical College, Associate Professor, Internal Medicine

Adolph, Anthony, MD; 1969, National University of Ireland, Associate Professor, Anesthesiology

Aguirre, Rafael, MS; 1966, Our Lady of the Lake University, Faculty Associate, Psychiatry

Akhter, Saeed, MD; 1983, Sinn Medical School-Pakistan, Assistant Professor, Surgery

Al Samman, Mounzer B., MD; 1987, Aleppo Medical School, Assistant Professor, Internal Medicine

Algeo, James H., MD; 1979, Jefferson Medical College, Assistant Professor, Radiology

Andrew, Leora P., MD/MPH; 1950/1987, University of Texas Medical Branch/University of Texas HSC-Center of Public Health-Houston, Associate Professor, Pediatrics

Anuras, Jitra, MD; 1968, University of Iowa, Professor, Internal Medicine

Aragon, Lorenzo, MD; 1985, Leon Nicaragua Medical School, Assistant Professor, Family and Community Medicine

Arredondo, Rodolfo M., EdD; 1976, Texas Tech University, Professor, Psychiatry

Arthaud, Rebecca R., MA; 1992, University of Missouri-Columbia, Faculty Associate, Health Communications

Asbell, Mary M., MA; 1974, University of Missouri-Columbia, Faculty Associate, Health Communications

Atkinson, Darryl A., DO; 1988, Oklahoma College of Osteopathic Medicine, Assistant Professor, Emergency Medicine

Bacchi-Smith, Donna, MD/MPH; 1981/1988, University of Cincinnati College of Medicine/John Hopkins University School of Medicine, Associate Professor, Pediatrics

Bagg, Raymond J., MD; 1958, New York Medical School, Professor, Orthopaedic Surgery

Bagg, Michael D., MD; 1989, Texas Tech University HSC School of Medicine, Assistant Professor, Surgery

Baida-Fragoso, Nicolas, MD; 1979, Autonomous University of Guadalajara, Instructor, Psychiatry

Baker, Laura K., MD; 1981, Texas Tech University HSC School of Medicine, Associate Professor, Family and Community Medicine

Baker, C.R.F., MD; 1961, Johns Hopkins, Professor, Surgery

Barceleau, Jaime, MS; 1986, University of Texas at El Paso, Faculty Associate, Orthopaedic Surgery

Bartold, Stephen, MD; 1977, University of Michigan, Associate Professor, Internal Medicine

Beale, Elmus G., PhD; 1977, Baylor College of Medicine, Associate Professor, Cell Biology and Biochemistry

Behal, Francis J., Ph.D.; 1958, University of Texas-Austin, Professor, Surgery

Bennett Jr., Robert E., MD; 1977, University of Arizona School of Medicine, Associate Professor, Pediatrics

Bergquist, Carol A., MD; 1967, University of Alberta, Professor and Regional Department Chairperson, Obstetrics and Gynecology

Berry, Lisa M., MA; 1992, University of Missouri-Columbia, Faculty Associate, Health Communications

Bessen, Steven, MD; 1988, University of California-San Diego, Assistant Professor, Radiology

Bhatia, Narinder, MD; 1984, Maolana Azad Medical College-New Delhi, Assistant Professor, Pediatrics

Biskinis, Evanthia K., MD; 1961, National and Kapodistrian University of Athens, Associate Professor, Pediatrics

Blackburn, Joseph, MS; 1990, University of North Texas-Denton, Faculty Associate, Health Communications

Blackwell, D. Eric, MD; 1973, Bowman Gray School of Medicine, Professor, Radiology

Blake, Christy, PNP; 1993, West Texas State University, Instructor, Pediatrics

Blakley, Gail E., MD; 1974, University of Colorado School of Medicine, Assistant Professor, Radiology

Blanc, Oscar, MD; 1990, University of Illinois College of Medicine, Instructor, Pediatrics

Blanton, Michael P., PhD; 1989, University of California-Santa Cruz, Assistant Professor, Pharmacology

Boger, James A., MD; 1966, University of Texas Medical Branch-Galveston, Associate Professor, Pediatrics

Boman, Darius A., MD; 1973, University of Bombay Medical College, Associate Professor, Pathology

Boone, Melchor, MD; 1989, University of Texas-Houston, Assistant Professor, Obstetrics and Gynecology

Bourgeois, Michael J., MD; 1975, Louisiana State University Medical Center-Shreveport, Associate Professor, Pediatrics

Bradley, Charles A., PhD; 1975, University of Kentucky, Professor, Pathology

Bravo-Large, Maria, MD; 1954, University of Madrid Medical School, Associate Professor, Radiology

Brewer, Karl M., MS; 1980, Louisiana Tech University, Faculty Associate, Family and Community Medicine

Bright, Tamis, MD; 1989, Loyola Stritch, Assistant Professor, Internal Medicine

Briones, David F., MD; 1971, University of Texas Medical Branch, Professor, Psychiatry

Broaddus, Stacy, MS; 1995, University of Texas El Paso/Texas Tech University, Instructor, Obstetrics and Gynecology

Brotman, Lawrence D., MD; 1964, University of Michigan School of Medicine, Assistant Professor, Radiology

Brower, Richard D., MD; 1985, University of Texas Medical Branch-Galveston, Associate Professor, Neurology

Brown, Sandra, MD; 1990, Northwestern University Medical School, Assistant Professor, Ophthalmology

Bryan, Earl D., MD; 1990, University of Texas HSC-Houston, Assistant Professor, Emergency Medicine

Bryan, Garnett, MD; 1958, University of Texas-Southwestern Medical School, Associate Professor, Family and Community Medicine

Bryant, Loren, PhD; 1989, Nova University, Assistant Professor, Family and Community Medicine

Buchman, Mark T., MD; 1979, Creighton University, Associate Professor, Orthopaedic Surgery

Burks, James K., MD; 1971, University of Texas Southwestern Medical School, Associate Professor, Internal Medicine

Burnstein, Alan, MD; 1988, McGill University Medical School, Assistant Professor, Ophthalmology

Butler, David, MD; 1980, University of Texas Medical Branch, Associate Professor, Dermatology

Butler, Thomas, MD; 1967, Vanderbilt University, Professor, Internal Medicine

Cameron, Donald D., MD; 1968, Baylor College of Medicine, Assistant Professor, Radiology

Campobassi-Abe, Margherita, MD; 1974, Georgetown University, Assistant Professor, Anesthesiology

Canez, Melin S., MD; 1986, University of Arizona-Tucson, Assistant Professor, Obstetrics and Gynecology

Carr, Anna M., MD; 1989, University of Texas Medical Branch, Assistant Professor, Pediatrics

Carrillo, Yvonne, Associates; 1976, El Paso Community College, Faculty Associate, Orthopaedic Surgery

Carroll, Paul T., PhD; 1973, University of Maryland, Professor, Pharmacology

Carter, Bonny L., MD; 1987, Texas Tech University HSC School of Medicine, Assistant Professor, Anesthesiology

Carter, Robert P., MD; 1965, University of Oklahoma School of Medicine, Professor, Obstetrics and Gynecology

Cartwright, Ceretha, PhD; 1995, University of Texas, Assistant Professor, Obstetrics and Gynecology

Casida, Elizabeth A., MLS; 1992, Texas Women's University-Denton, Faculty Associate, Health Communications

Casner, Paul R., MD; 1980, New York Medical College, Professor, Internal Medicine

Castracane, V. Daniel, PhD; 1972, Rutgers University, Professor, Obstetrics and Gynecology

Chaffin. W. LaJean, PhD; 1971, University of Wisconsin-Madison, Professor, Microbiology and Immunology

Chamberlin, Samantha, MD; 1989, University of Singapore, Assistant Professor, Pediatrics

Chandler, Pamela A., MD; 1983, University of Texas HSC School of Medicine-San Antonio, Associate Professor, Obstetrics and Gynecology

Chandra, Phool, MD; 1953, Lucknow University, Associate Professor, Anesthesiology

Chaudhuri, Kallol, MD; 1980, Calcutta Medical College, Assistant Professor, Anesthesiology

Chauncey, Mary Katherine, PhD; 1992, Texas Tech University, Assistant Professor, Family and Community Medicine

Cheng, Tien H., MD; 1976, Washington University School of Medicine, Associate Professor, Radiology

Chilton, Beverly S., PhD; 1976, University of Tennessee, Professor, Cell Biology and Biochemistry

Chiodo, Louis A., PhD; 1981, University of Pittsburgh, Department Chairperson, Pharmacology

Chittivelu, Subrahanyam, MD; 1987, Maimonides Medical School, Assistant Professor, Internal Medicine

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Date Due
