TEXAS TECH UNIVERSITY HEALTH SCIENCES CENTER

School of Medicine

Catalog

1995-97

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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 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

BOARD OF REGENTS

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Edward E., Whitacre, Jr., Chairman
John C. Sims, Vice Chairman

Members

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John C. Sims - Lubbock
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Term Expires January 31, 1999
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Term Expires January 31, 2001
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Assistant Vice President - El Paso
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Assistant Vice President - Odessa
Robert P. Carter, M.D.

TEXAS TECH UNIVERSITY
HEALTH SCIENCES CENTER

ADDENDUM TO 1995-1997 CATALOG
May 1, 1997

Please note that, in fall of 1996, the administrative structure of the University and of the Health Sciences Center was changed. A Chancellor was selected to head both institutions, and each institution has chosen a President. This replaces the previous structure of a single President with two Executive Vice Presidents. A single Board of Regents still sits separately for each institution, and members are appointed each three years by the Governor of the State of Texas.

On Page 4, note that the three new Regents with terms until January 31, 1999 are
John Jones - Brady
Dr. Nancy E. Jones - Abilene
Mike Weiss - Lubbock

Health Sciences Center Administration

Chancellor for Texas Tech University and TTU Health Sciences Center
The Hon. John T. Montford

President of Health Sciences Center
David R. Smith, M.D.

Vice President for Fiscal Affairs
Elmo Cavin

Vice President for Operations and Student Support Services
Richard Butler

Vice President for Planning, Policy, and Federal Relations
Glen Provost

Assistant Vice President - Amarillo
E. Lee Taylor, Jr., M.D.

Interim Assistant Vice President - El Paso
J. Manuel de la Rosa, M.D.

Interim Assistant Vice President - Odessa
Leonard Morgan, M.D.

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School of Medicine

Dean - Joel Kupersmith, M.D.

Dean of Graduate School of Biomedical Sciences, and
Associate Dean for Basic Sciences
David J. Hentges, Ph.D.

Regional Dean - Amarillo
E. Lee Taylor, Jr., M.D.

Interim Regional Dean - El Paso
J. Manuel de la Rosa, M.D.

TEXAS TECH UNIVERSITY HEALTH SCIENCES CENTER

BOARD OF REGENTS

Regional Dean - Lubbock
Dale M. Dunn, M.D.

Interim Regional Dean - Odessa
Leonard Morgan, M.D.

Associate Dean for Educational Programs
Terry C. McMahon, M.D.

Associate Dean for Admissions
James A. Chappell, M.D.

Associate Dean for Strategic Planning and Special Projects
E. Jay Wheeler, M.D., Ph.D.

The Admissions Process

Please note that the admissions process, described on pages 9-12, is unchanged. Pursuant to the 5th Circuit Court of Appeals ruling in *Hopwood v. Texas*, the Advantages in Medical School (AIMS) program described on Pages 13 and 14 has been closed to further entrants.

Technical Standards for Completion of Curriculum

In 1995, the faculty of the School of Medicine developed and approved academic and technical standards for entry to and completion of the medical curriculum. These are described on pages 15-16. The current procedure is that a copy of the Standards are enclosed in each application packet as information and requires no response from the applicant. When invitation for interview is offered, a second copy is mailed with the invitation, and students are asked whether they can meet the standards as stated or whether/what accommodation would be necessary for completion of the curriculum. At and following the interview, it will be determined whether the prescribed accommodation can be provided. That process is outlined on page 16.

Student Counseling Services

Psychological counseling services are available to medical students through qualified counselors of the Texas Tech University Student Counseling Center. The counselors come to the Health Sciences Center and are located in the HSC Office of Student Services. Students may refer themselves, so that it is not necessary to gain access through any office of the School of Medicine.

United States Medical Licensing Examination - Step I

As of 1997, all students **are required** to pass USMLE-I as a condition of entry to the third year of the curriculum. Students take the examination in June after the second year and proceed to the third year in July. If a student fails the exam, s/he may complete the clinical rotation which s/he has begun; and then withdraws from the third year until the examination is passed. Students still are required to sit for USMLE-II prior to graduation; but passing of USMLE-II is **not** required for graduation.

TEXAS TECH UNIVERSITY HEALTH SCIENCES CENTER

SCHOOL OF MEDICINE

Dean - Darryl M. Williams, M.D.

Regional Dean
Texas Tech University HSC at Amarillo
E. Lee Taylor, M.D.

Regional Dean
Texas Tech University HSC at El Paso
Gary W. Welch, M.D., Ph.D., J.D.

Regional Dean
Texas Tech University HSC at Lubbock
Dale M. Dunn, M.D.

Regional Dean
Texas Tech University HSC at Odessa
Robert P. Carter, M.D.

Associate Dean for Academic Affairs
James A. Chappell, M.D.

Associate Dean for Strategic Planning and Program Development
E. Jay Wheeler, M.D., Ph.D.

Associate Dean for Graduate Studies and Research
Kenneth L. Barker, Ph.D.

Associate Dean for Continuing Medical Education
C. L. Montgomery, M.D.

Assistant Dean for Medical Education
Terry C. McMahon, M.D.

Assistant Dean for Minority Affairs
J. Ernesto Mendez, M.D.

Assistant Dean for Rural Health
C. Alvin Jones, M.D.

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; has emphasis on primary patient care and likewise on 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.

The decision to develop specialty care areas consonant with the fundamental primary care mission has been made with due deliberation and concern for breadth of an academic program which provides for the general education of the physician and also for the advancement of health care and medical sciences in West Texas.

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 regional centers 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 four schools in the Health Sciences Center, the other three being the Schools of Nursing, Allied Health, and Pharmacy. All four 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.An effort is made to achieve a balanced group with qualified minority students, diverse age groups, and heterogenous backgrounds in educational and life experiences. A secondary effort relates to recruitment of applicants from West Texas.

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 440 with 111 part time faculty and 1,002 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 students in Amarillo, 35 in Lubbock, and 55 in El Paso. The campus at Odessa provides only graduate training and certain undergraduate elective experiences.

Assignments to the regional campuses are based largely 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. They 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, and Veterans Administration Outpatient Clinic.

In Amarillo, clinical education is provided in area hospitals and health care facilities. These include Northwest Texas Hospital, High Plains Baptist Hospital, Don and Sybil Harrington Cancer Center, the Psychiatric Pavilion, Killgore Children's Hospital, St. Anthony's Hospital, 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, Landmark Hospital and Medical Center, and Sierra Medical Center. In a pilot program co-sponsored with the W. K. Kellogg Foundation, selected students receive an appreciable portion of the clinical curriculum in community-based ambulatory settings.

The educational quality at each regional center is comparable as indicated by monitoring of number and types of patients seen and by uniform performance on standardized measures such as National Board examinations and demonstration of knowledge and skills with standardized patients and with Objective Structured Clinical Examinations (OSCE).

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 438 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.

We believe that the missions of the School of Medicine are being achieved at each regional center and for the total school. While education of students and residents remains the primary focus of the institution, there has been an important positive impact on the health status of West Texas. In providing a good quality undergraduate, graduate, and continuing medical education at each site, the health needs of the larger community have been better met and relevant indices of health status demonstrate significant improvement.

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 greater than 3.5 and an MCAT score higher than 30. One hundred and twenty students are selected for each entering class. The Admissions Committee carefully examines each application for quality of academic record and likewise 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 attentively 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 diverse 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.

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)	2 years
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 is likewise desirable but not required.

Medical College Admission Test (MCAT)

Completion of the Medical College Admission Test (MCAT) within three years of application is a requirement for admission. MCAT scores achieved prior to April, 1991, will not be considered. 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 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 November. The accepted student has two weeks in which to accept or decline the offer.

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 final 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

The School of Medicine reserves the right to accept an applicant to advanced standing on a competitive basis when a position is available. Under the accreditation standards of the Liaison Committee on Medical Education (LCME), Texas Tech

may accept 120 first year students each year, for a total of 480 students by 1998. Positions become available for advanced students only through withdrawal or attrition and are few in number.

Preference for available positions will be given to Texas students enrolled in good standing in LCME-approved medical schools. Such applicants may be interviewed and must have passed Step I of the United States Medical Licensing Examination (USMLE-I) as a condition for acceptance. Entry into the curriculum may be delayed until the test scores are returned. Applicants who have graduated or who have successfully completed their third year at non-LCME approved schools may be considered on an individual basis if they have already passed USMLE-I with a score at or above the national mean.

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. 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 challenge the external examinations in Anatomy, Biochemistry, Histology, and Physiology and the departmental examination in Integrated Neurosciences. 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 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 would 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.

In each of the categories above, the applicant for advanced standing must be a bona fide Texas resident with at least 90 hours of undergraduate study in an accredited U.S. or Canadian college or university.

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 a 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 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:

Associate Dean/Academic Affairs
Texas Tech University Health Sciences Center
School of Medicine
3601 4th Street
Lubbock, TX 79430-0001
Phone: 806-743-3005

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.

Advantage In Medical School (AIMS)

The Advantage In Medical School (AIMS) program is designed to increase the number of underrepresented minorities in the TTUHSC School of Medicine. It is a unique program for the recruitment and retention of disadvantaged students based on a four and one-half year progressively accelerating medical school curriculum.

A sub-committee of the Admissions Committee selects up to six students per year who have been rejected for acceptance to medical school in the traditional admissions process. While, in some cases, the academic credentials may be lower than those of the regular entering class, these students demonstrate maturity, motivation, perseverance, and personal skills to become physicians.

Upon entering school in the spring preceding their first year, AIMS students take Developmental Anatomy and Statistics with the traditional medical students plus a community-based clinical elective. In addition, they participate in a seminar series with a the Program Director, an educational specialist, in a series of sessions designed to remediate problems in reading, study skills, test taking, and time management. In the summer they take the concentrated course in Gross Anatomy and become part of the incoming first year class in the fall. By the time AIMS students enter the second year, they are in the same curriculum as their classmates. From entry until graduation, AIMS students are held to the same performance and grading standards as the students in the traditional track. The program continues to prove successful.

In support of the program, the Texas Coordinating Board of Higher Education has agreed that AIMS students may pay tuition based on a four rather than four and one-half year program. As in the case with traditional students, grants, loans, and scholarships are also available.

CODE OF PROFESSIONAL CONDUCT/HONOR SYSTEM

By registration in the School of Medicine, each student consciously 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 charges are deemed valid, there is an appropriate hearing before a student-faculty committee which determines appropriate action. There is an appeal procedure to ensure due process, and the Dean makes a final opinion based on both hearings. 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

It is the firm policy of the School of Medicine that no person shall be denied admission to the school nor graduation from the school on the basis of any disability, provided that the person demonstrates ability to meet the minimum standards set by the faculty for entry into and progression through the medical curriculum. These standards have been developed to achieve the Doctor of Medicine degree in preparation for postgraduate training and for licensure as a practicing physician. Additionally, the safety of the patient, on whom the medical education process is largely focused, must be guarded as a primary consideration.

The School of Medicine recognizes that certain disabilities can be accommodated without compromising the standards required by the school and the integrity of its curriculum. The school is committed to the development of innovative and creative ways of opening its curriculum to competitive and qualified candidates with disabilities.

Mastery of the essential functions of the curriculum is required of all students. The standards encompass cognitive, physical, and behavioral requirements in six areas judged necessary by the faculty for satisfactory completion of the medical curriculum. These include, but are not necessarily limited to:

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 non-verbal 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 where 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 and in unpredictable ways.

6. Ethical and professional attitudes and conduct.

The standards summarized above refer to desired ends rather than the means to achieve each standard because a person with a disability may be able to achieve the standards using reasonable accommodation. The faculty judges that the use of a trained intermediary to observe or interpret information does compromise the essential function of the physician.

Questions regarding standards for curricular completion are dealt with on an individual basis so that reasonable accommodation can be appropriately arranged when feasible. A copy of the detailed essential standards for curricular completion will be furnished with each application packet, and may be obtained from the Office of Academic Affairs.

When a letter of acceptance to the School of Medicine is mailed to an applicant, a second copy of the standards will be included with that letter. At that time, the applicant will be asked to respond in writing whether he/she can meet the standards with or without accommodation. In the event that accommodation is requested, the student must submit documentation of disability with proposed accommodation from a certified specialist to the office of Academic Affairs. The school may require verification by a specialist whom it has approved. A judgement will be made by a committee composed of the Associate Dean for Academic Affairs, legal counsel, and appropriate ad hoc faculty members who are knowledgeable in the field of the particular disability. If a reasonable accommodation cannot be achieved, the letter of acceptance will be withdrawn.

A detailed copy of the essential standards may be obtained from:

Office of Academic Affairs
Room 2B122
TTUHSC School of Medicine
3601 4th Street
Lubbock, TX 79430-0002

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; traffic is unhurried in each city on which there is a campus; 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. Yearbook.
The "Plexus" is produced annually by HSC volunteers from the student bodies of the three schools.

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

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

E. 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.

STUDENT ORGANIZATIONS

1. HSC Student Senate

Organized in 1986, the HSC Student Senate was established to foster better relationships among the students in the three 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 Executive Vice President and Provost 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 Academic 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-half its members in their Junior year and the other one-half 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 Amarillo Town Club with pool and exercise equipment for a minimal fee/visit.

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. Emergency Room visits, consultation, and hospitalization are at the student's expense. All students are strongly urged 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
1994-95

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

	Texas Tuition	Non-Resident
Tuition	* $6,550.00	* $19,650.00
General Use	221.00	221.00
Student Services	250.00	250.00
Laboratory	32.00	32.00
Microscope Rental	120.00	120.00
Liability Insurance	25.00	25.00
Property Deposit	20.00	20.00
University Center	20.00	20.00
Student ID	5.00	5.00
Student Health Insurance	**	**
Medical Services Fee	84.00	84.00
Parking Permit	52.00	52.00
Information Technology Fee	50.00	50.00
International Education Fee	2.00	2.00
Long-Term Disability Insurance Fee	75.00	75.00
Total Tuition and Fees	$7,502.00	$20,602.00

* Installment option available at 1.5% of unpaid balance.
**TTU/TTUHSC Plan - Single Student/12 months = $562.00
TMA Insurance Trust-Single Student/12 mos. = 637.00 with $1,000 deductible (quarterly payments=$158.00).

The estimated student budget is $ 10,676 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

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 his 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 his 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 ($52.00 per year in 1995-96).

FINANCIAL AID

Texas Tech University Health Sciences Center School of Medicine provides financial assistance to students who, without such assistance, would not be able to pursue a medical education.

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 need analysis is required of applicants for most financial aid programs. The school uses the need analysis system published by American College Testing, the Family Financial Statement (ACT-FFS).

There are several forms of financial aid, including loans, scholarships, and grants offered to students on the basis of financial need and other qualifications as specified by the donor organizations.

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:

Director of Student Financial Aid
Texas Tech University Health Sciences Center
Lubbock, TX 79430

SCHOLARSHIPS

Administered through Office of Student Financial Aid-HSC:
Martin and Alice Dalton Scholarship in Medicine
Christine DeVitt Medical Student Scholarship
The Arleigh and Eloise Drake Medical Scholarship
Robert A. Flygare Memorial Scholarship
Lawrence Keith Jones Memorial Scholarship
Lubbock-Crosby-Garza County Medical Society Scholarship
Dr. James Elbert Loveless Endowed Scholarship
Robert R. McDaniel, M.D. Endowed Scholarship
April Ann Morris Memorial Scholarship
Lee C. and Beulah O'Neil Scholarship for Medical Students
Southern Medical Association Student Tuition Scholarship

Administered through funding agency:
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 Assistance Loan (HEAL)
Health Professions Student Loan (HPSL)
Robert Wood Johnson Loan Fund
Mexican-American Physicians' Association Loan Program
Ralston Student Loan Fund
Federal Stafford Student Loans (FSSL)
Federal Unsubsidized Stafford Student Loan (FUSSL)
Federal Parent Loan for Undergraduate Students (FPLUS)
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 to be 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 July, 1988, 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 March, 1995, 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; Physiology; Medical Ethics, and Biostatistics. 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, Introduction to Medicine, and Preventive Medicine. Building upon and integrating the knowledge of the basic sciences, there is an extensive course in Introduction to Patient Assessment in which the fundamentals of interviewing and physical diagnosis are correlated with an introduction to analytical problem-solving skills.

The third year is characterized by several changes in educational format. The setting is clinical rather than classroom 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 for intercampus equivalence. Students at each campus maintain logs of patients seen and 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. To date, the values are so well correlated that we will describe them in this catalog as though they were 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 Academic Affairs likewise is active in orientation programs and in individualized counsel directed toward 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 Academic Affairs contacts each student who exhibits any academic difficulty and explores with the students possible areas of difficulty with appropriate counsel or referral for resolution. In the basic science curriculum, there is opportunity for tutorial service arranged by the departments in utilization of peer tutors. Each student is monitored by the clerkships director in progress through the clinical curriculum for early detection and intervention in problems. Seminars and individual assistance in modification of learning styles are available through a full time educational specialist in the Office of Academic Affairs. Assistance in personal problems which result in academic difficulty is available from a variety of resources.

LIBRARY

The Texas Tech University Health Sciences Center Library presently contains more than 199,000 total volumes and over 1,300 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, circulation, Mini-Medline [TM], electronic mail, and other activities. 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 manages three teaching-learning centers which, in addition to housing the non-print collection, 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. The most recent teaching-learning center is configured as a classroom with interactive terminals between the instructor and the student. This classroom uses the resources of a mini computer.

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 Step I of the United States Medical Licensing Examination (USMLE) on 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-I is not, however, a condition for passing from Year II to Year III. Students will be required to take Step II prior to graduation under the conditions outlined for Step I. It is likely that students will be required to pass USMLE-I as a condition for promotion to the fourth year. When that decision is made, an addendum will be inserted in this catalog.

CURRICULUM CONTENT AS OF 1994-95 ACADEMIC YEAR

First Year: Begins August, Duration 34 weeks, Scheduled hours per week = 27
Required Courses

	Contact Hours	Credit Hours
Gross Anatomy	156	6
Histology	82	4
Biochemistry	124	8
The Physician in Society	28	1
Neurosciences	170	8
Physiology	176	9
Human Development	38	2
Biostatistics	16	1
Elective	16	1

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

	Contact Hours	Credit Hours
Microbiology	153	8
Pharmacology	113	6
Medical Pathology	238	16
Intro. to Patient Assessment+Practicum	96	4
Intro. to Internal Medicine	108	5
Intro. to Psychiatry+Interviewing	58	3
Preventive Medicine (II)	30	2

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 Subspecialities	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 underserved 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 preclinical 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 each department. The curricular offerings on each clinical campus are coordinated within the respective departments,, so that equivalent educational experiences are offered through the Tech System. In each of the six basic clerkships, students maintain patient logs so that the numbers and types of patients seen at each campus can be monitored. 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. Increasingly, standardized patients and Objective Structured Clinical Examinations (OSCE) on each campus provide greater depth in evaluation of clinical abilities. 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
Professor L. Donald Randino, D.O.
Interim Regional Chairman (El Paso)
Associate Professor Ronald Heinrich, M.D.
Associate Chairman (Lubbock)
Professors: Cockings, Heavner (Lubbock)
Associate Professors: Chandra (El Paso); Badgwell (Lubbock)
Assistant Professors: Arthur, Carter, deSocarraz, Diede,
Haggard, Randolph, Wilson, Umphrey (Lubbock)
Instructor: Jalandoni, McLeod (Lubbock)

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: Barker, Behal*, Chilton, Everse, Faust, Garner, Hutson, Morrow, Norman, Poduslo*, Reid*, and Stocco
Associate Professors: Beale, Coates, Dalley, Doris, Khan, Little, McGlone*, Pelley, B. Pence*, Phillips*, Sridhara, Trevillyan*, Whelly, and Wright*
Assistant Professors: Cameron*, Cornwall, Donahue, Droms, Knisley, Lee, Webster, and Whisnant*
*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 training leading to the combined MD/PhD degrees. This specialized curriculum involves 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. This degree program offers a tuition scholarship and a competitive financial stipend.

Required courses for the traditional medical school curriculum:

BCH 50921 - 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.

MAN 50210 - HUMAN DEVELOPMENT. The study of human development beginning at fertilization and continuing through embryogenesis, the formation of mature organ systems, and the fetal period culminating with events leading to birth. Normal development is integrated with discussions of various congenital malformations.

MAN 50411 - 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.

MAN 50609 - 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.

The Department of Cell Biology and Biochemistry is integral to the Medical Scientist Program and likewise offers graduate degrees to students enrolled in the Graduate Biomedical Program. These offerings are detailed in the section on Graduate Biomedical Programs.

Required courses for the MD/PhD program:
MAN 50210 - HUMAN DEVELOPMENT. See above.
MAN 50411 - HUMAN HISTOLOGY AND CELL BIOLOGY. See above.
MAN 50609 - HUMAN GROSS ANATOMY. See above.

ANM 5301 - CELL STRUCTURE AND FUNCTION - Core Course 1 (3:3:0). Topics include assembly, structure, and function of membranes, organelles, and the cytoskeleton, and the basic mechanisms of transcription and translation.
ANM 5302 - THE CELL CYCLE - Core Course 2 (3:3:0). Prerequisite: ANM 5301 or equivalent and consent of instructor. Examination of DNA replication and repair, meiosis and recombination, and mitosis and the genetics of cell cycle control.
ANM 5304 - CELLULAR INTERACTIONS - Core Course 3 (3:3:0). Prerequisite: ANM 5301 or equivalent and consent of instructor. Study of hormones, growth factors, mechanisms of signal transduction, cell adhesion molecules and the extracellular matrix.
ANM 5306 - MECHANISMS OF CELLULAR DIFFERENTIATION - Core Course 4 (3:3:0). Prerequisite: ANM 5301 or equivalent and 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.
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.
ANM 7000 - RESEARCH (V1-12)
ANM 8000 - DOCTORAL DISSERTATION (V1-12)

Required courses for the Medical Biochemistry MD/PhD program:
BCH 50921 - MEDICAL BIOCHEMISTRY. See above.
BCH 5322 - BIOMEDICAL RADIOISOTOPE TECHNIQUES (3:3:0). Prerequisite: BCH 5921, CHEM 4303, 4306, 4307, or equivalent. Basic radioisotope techniques as used in biomedical research with special emphasis on liquid scintillation counting techniques.

BCH 6522 - MOLECULAR BIOLOGY OF EUKARYOTES: NUCLEIC ACIDS (5:5:0). Prerequisite: BCH 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.

BCH 6532 - REGULATORY MECHANISMS IN BIOCHEMISTRY (5:5:0). Prerequisite: BCH 5921 or equivalent and consent of instructor. A study of current knowledge of molecular mechanisms for the regulation of cellular processes, including both endocrine and nonendocrine mechanisms.

BCH 6533 - MOLECULAR BIOLOGY OF EUKARYOTES: PROTEINS (5:5:0). Prerequisite: BCH 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 physico-chemical methods used to characterize proteins and their molecular structure.

BCH 7000 - RESEARCH (V1-12).

BCH 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: Neldner
Assistant Professors: Cameron, Shah

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. The national headquarters for the American Society of Dermatopathology will be located within the department until 1997.

DEPARTMENT OF EMERGENCY MEDICINE

Associate Professor Brian K. Nelson, M.D.
Chairman (El Paso)
Associate Professors: Binder, Glass (El Paso)
Assistant Professors: Loflin, Mackay, Peterson, Postma, Walsh (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 subspecialities such as pediatric emergencies, toxicology or research.

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

DEPARTMENT OF FAMILY MEDICINE

Associate Professor Richard V. Homan, M.D.
Chairman
Associate Professor Charles V. Wright, Jr., M.D.
Regional Chairman (Amarillo)
Associate Professor J. Dennis Mull, M.D.
Regional Chairman (El Paso)
Professor Charles Alvin Jones, M.D.
Associate Chairman (Lubbock)
Professor Leonard Morgan, M.D.
Regional Chairman (Odessa)
Professors: Jones, Shields (Lubbock)
Associate Professors: Egerton, Garms (Amarillo); Baker, Homan, Fried, Montgomery (Lubbock)
Assistant Professors: Karjeker, Parish (Amarillo); Demby, Noriega, Van Norman (El Paso); Bryant, Chauncey, Hrachovy, Jones, Peck, Tyler (Lubbock); Curley (Odessa)
Instructors: Rubio (El Paso); Counts, Dyer (Lubbock)

The Department of Family 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 biomedical, 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.

Required Course:

MFP 70901 - 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: Boyd, Buesseler, Flood, O'Malley, Paez, Selim, Stanton, and Teague
Joint Faculty: Arrendondo, Austin, Bertram, Clancy, Courtney, D. Hale, Hunt, Macy, McGovern, Peterson, Phillips, Poteet, Powers, Ritchey, Schilder, and Whitehead

The TTUHSC School of Medicine and the College of Business Administration (COBA) of Texas Tech University jointly administer this department. The goal of the Department of HOM is to provide educational and research opportunities in the management of health care organizations, and research in medical education, health care policy, ethics, and social responsibility. Courses and topical presentations in these areas are presented for medical students and residents. Students may choose to pursue an M.B.A. with a concentration in health organization management or an 18-hour Certificate of Professional Studies for persons with baccalaureate, graduate, or medical degree. 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 - Medical Aspects of Health Organization Management (3:3:0). Prerequisite: MGT 5370 and admission to MBA or MPA degree program or permission of HOM Program Director. A course focusing 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)

MGT 5307 - Ambulatory Health Organization Management (3:3:0). Prerequisite: MGT 5306, MGT 5370, ECO 5337 and admission to MBA or MPA degree program or permission of HOM Program Director. A course examining key contemporary issues in the organization and management of ambulatory health care organizations, including medical practices. (MGT 5307)

MGT 5308 - Health Organization Management (3:3:0). Prerequisite: MGT 5306, MGT 5307, MGT 5370, ECO 5337 and admission to MBA of MPA degree program or permission of HOM Program Director.Designed to provide an overview of the health care system: its managerial, social, behavioral, and economic aspects from a macroscopicviewpoint. (MGT 5308)

MGT 5309 - Contemporary Issues in Health Organization Management (3:3:0). Prerequisite: MGT 5306, MGT 5307, MGT 5308, MGT 5370, ECO 5337 and admission to MBA or MPA degree program or permission of HOM Program Director. Designed to analyze and evaluate selected contemporary problems, issues, and trends in organized health care delivery, primarily at the micro level. (MGT 5309)

MGT 7000 - Research (VI-12).

DEPARTMENT OF INTERNAL MEDICINE

Professor Neil A. Kurtzman, M.D.
Chairman
Associate Professor Constantine Saadeh, M.D.
Regional Chairman (Amarillo)
Professor William Lee Hand, M.D.
Regional Chairman (El Paso)
Professor Kenneth Nugent, M.D.
Associate Chairman (Lubbock)
Professor Harvey S. Kantor, M.D.
Acting Regional Chairman (Odessa)
Professors: Pruitt (Amarillo); DiNardo-Ekery, Martinez-Lopez, Verghese (El Paso); J. Anuras, Bartholomew, Boyd, Buell, Butler, Kimbrough, Park, Sabatini, Wesson, Williams (Lubbock)
Associate Professors: Funderburk, Phillips, Trevillyan, Werner (Amarillo); Abedin, Casner, Ho, Faris, Rivera, Zuckerman (El Paso); Elks, Laski, Mattison, Norris (Lubbock); Burks (Odessa)
Assistant Professors: Khandheria, Muthali (Amarillo); Gonzalez, Hernandez, Pema, Rowley (El Paso); Cobos, Crawford, Galasso, Jenkins, Karaki, Keung, Liu, Nguyen, Spohn, Trowers (Lubbock); Wysoske (Odessa)
Instructors: Bridges, Burwock, Cutts (Amarillo)

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:

MIM 60433 - 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.

MIM 71817 - 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 David J. Hentges, Ph.D.
Chairman
Professors: Lefkowitz, Butler*, D. Pence*
Associate Professors: Chaffin, Dougherty*, Fralick, Joys, Marsh*, Phillips*, Ritzi, Rolfe, Saadeh*, Straus, Trevillyan*, and Wright*
Assistant Professor: Bjorndahl*, Dombrowski*, and Hamood
Adjunct Assistant Professors: Amonett
*Joint Appointment

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:

MMB 60631 - 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 NEUROLOGY

Professor Richard W. Homan, M.D.
Chairman
Professor A. Cuetter, M.D.
Associate Chairman, El Paso
Professors: Hurst, Poduslo, Wauquier (Lubbock)
Associate Professors: Freed, Hogg, H. Strahlendorf (Lubbock); Rowe, Buscemi (El Paso)
Assistant Professors: Denaro, Nemire (Lubbock)

The Department 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 and subspecialty areas of adult neurology (electroencephalography and evoked potentials, electromyography, epilepsy, neuromuscular disease, dementia, movement disorders, etc.).

Required Courses:

MID 50901 - INTEGRATED NEUROSCIENCES. A detailed study of the nervous system with an examination of both gross and fine structure and function from the cellular through behavioral levels.

MNY 80602 - 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 Robert H. Messer, M.D.
Chairman
Professor Bobby A. Rimer, M.D.
Regional Chairman (Amarillo)
Professor Joseph Sakakini, M.D.
Regional Chairman (El Paso)
Professor Daniel E. McGunegle, M.D.
Associate Chairman (Lubbock)
Professor Carol Bergquist, M.D.
Regional Chairman (Odessa)
Professors: Castracane, Hisley (Amarillo); Scragg (El Paso); Lox, Welt (Lubbock); Baldwin, Braun, Carter (Odessa)
Associate Professors: Greenberg, Harlass, Sullivan (El Paso); Murray (Lubbock); Tarvin (Odessa)
Assistant Professors: Chandler, Flood-Shaffer, Reddi, Vera (El Paso); Prien, Canez, Atkinson (Lubbock); Brantley, Donovan, Mendez (Odessa)
Instructors: Hall, 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:

MOB 71247 - 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: Reid, Young
Associate Professor: Crosson
Assistant Professors: Morales, Shami

The goals of the Department of Ophthalmology and Visual Sciences are to deliver quality patient care, to perform quality 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 vision 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. One ophthalmologist is admitted each year for a two year vitreoretinal fellowship. There are opportunities for graduate study, postdoctoral, clinical and basic research fellowships, and research sabbaticals in the department.

Required Courses:

MOY 50101 - 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.

The faculty and residents provide clinical instruction on ocular examination to all sophomores during the physical diagnosis rotation.

MOY 50100 and **OPH 80** - FRESHMAN AND UPPER-CLASS CLINICAL ELECTIVES. During their clinical rotation, medical students will work closely with ophthalmology residents in the department's clinic, which serves a diverse patient population covering the entire range of ophthalmic pathology. Grand Rounds, regularly scheduled lectures, conferences, frequent visiting professors, and a monthly vision research seminar provide an excellent basis for teaching and scientific interaction.

MOY 80 - RESEARCH ELECTIVE. Research electives are available to all medical students 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); Brooker, Hartman (Lubbock)
Associate Professors: Johnston (Amarillo); Janssen, Yost (Lubbock)
Assistant Professors: Alicea, Rosen (El Paso); Molligan, Stasikelis (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, and adult reconstruction. In Lubbock, a division of orthopaedic research provides research opportunities for students and residents.

A masters degree program in Sports Health is offered through the combined efforts of the Departments of Orthopaedics and Physical Education at Texas Tech University.

DEPARTMENT OF PATHOLOGY

Professor Dale M. Dunn, M.D.
Chairman
Associate Professor Darius A. Bowman, M.D.
Regional Chairman (El Paso)
Professors: Bradley and D. Pence (Lubbock)
Associate Professors: Graham, B. Pence, and Tran (Lubbock)
Assistant Professors: Bassler, Dudrey, and Kalamegham (El Paso); Debowski, Kuratko, V. Mamlok, Morgan, Reimund, and Williams (Lubbock)
Clinical Instructor: Henry (El Paso)
Faculty Associate: Colmer and Humphrey

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 Pathophysiology. In addition, the pathology department is involved in interdepartmental teaching and participation whenever indicated.

Required Course:

MPA 61543 - 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 will be utilized as a teaching mechanism for students enrolled in the Pathology course.

DEPARTMENT OF PEDIATRICS

Professor Richard Lampe, M.D.
Chairman
Professor Terry Myers, M.D., Ph.D.
Interim Regional Chairman (Amarillo)
Associate Professor Gilbert A. Handal, M.D.
Regional Chairman (El Paso)
Associate Professor Alfred N. Karickhoff, M.D.
Regional Chairman (Odessa)
Professors: Hammer (Amarillo); Allen**, Chappell, Gururaj, Holmes*, T. Myers, Joon Park, Varma, Welt* (Lubbock)
Associate Professors: Andrew, Chuachingco, Hale, Naqvi, Sheehan, (Amarillo); Jesurun, Levin, Logvinoff (El Paso); Badgwell*, Bourgeois, Craig, Fang**, Garcia, George*, Goldthorn*, Hurst*, Iacuone**, Lacey*, Law, Marsh, M. Myers, Vordermark*, (Lubbock); Talbert (Odessa)
Assistant Professors: Al-Khalil, Biskinis, Haider, Muthali, Schneider (Amarillo); Chamberlin, Christenson, Gardea, Henderson, Hooper, Ipson, Schuster, Seifert, Shirsat, Suchoff (El Paso); Douthit, Eldadah, Higgins**, Klepper, R. Mamlok**, V. Mamlok*, Narendran**, O'Neill**, Perez, Riff, Riojas**, Waagner, (Lubbock); Bennett, Jung Park, Rogers (Odessa)
Instructors: Bridges, Burwick (Amarillo); Sheridan-Shayeb (Odessa)
* - 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:

MPD 71237 - PEDIATRIC CLERKSHIP. 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, Lombardini, Pirch, Tenner
Associate Professors: Casner*, Freeman, Hale*, K. McMahon, H. Strahlendorf
Assistant Professors: Crosson*, Reigel, Syapin
*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:

MPH 60712 - 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:

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.

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, endocrine, neurochemical, biochemical, or molecular pharmacology; chemotherapy; neuropharmacology; or neuropsychopharmacology.

DEPARTMENT OF PHYSIOLOGY

Professor Sandra Sabatini, M.D., Ph.D.
Chairman
Professors: Crass, Davies, Heavner*, Kurtzman*, Lutherer, McGrath, Orem, and Wesson
Associate Professors: Janssen*, Laski*, Nathan, H. Strahlendorf*, and J. Strahlendorf
Assistant Professor: Fowler, Gyorke, and Neely
*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:

MPY 51022 - MEDICAL PHYSIOLOGY. A study of human physiology with major emphasis on body controlling systems and their interrelations. Pathophysiological mechanisms also are stressed.

DEPARTMENT OF PREVENTIVE MEDICINE AND COMMUNITY HEALTH

Professor Anthony B. Way, M.D., Ph.D.
Chairman
Professors: Chappell*
Assistant Professor: Ellsworth, D. Shires, R. Warner
Instructor: K. Hentges*
*Joint Appointment

Preventive Medicine is a specialized field of medical practice composed of: general preventive medicine, occupational medicine, public health and aerospace medicine. The goal of this department is to provide a center of excellence in: clinical preventive medicine, environmental and occupational health, health care organization and administration, epidemiology and social and behavioral sciences.

The teaching objective is to explain the principles of statistics, epidemiology, and preventive medicine, particularly as they relate to primary care in general. Emphasis is placed upon disease prevention and health promotion. The service objective is to demonstrate the application of these principles in clinical settings. The research objective is to develop understandings which are basic to preventive medicine and community health.

Required Courses:
MPM 50202 - BIOSTATISTICS. Introduces quantitative methods and principles.
MPM 60201 - PREVENTIVE MEDICINE AND COMMUNITY HEALTH. Reviews and continues quantitative methods and introduces clinical prevention.

DEPARTMENT OF PSYCHIATRY

Professor Richard L. Weddige, M.D., Chairman
Associate Professor Mitchell Jones, M.D.
Associate Chairman (Amarillo)
Associate Professor David Briones, M.D.
Associate Chairman (El Paso)
Professors: Malek-Ahmadi, T. McMahon, Simonds (Lubbock)
Associate Professors: Arredondo, Contreras, McGovern, Yung (Lubbock); Guerrero (El Paso)
Assistant Professors: Banken, Grove, Manning, Stuyt, and Little (Lubbock); D. LaGrone, H. LaGrone, O'Rear (Amarillo)
Instructor: Howe (Lubbock)

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 comtemporary psychiatry.

Required Courses:

MPS 60452 - 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.

MPS 71257 - 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.

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: Shieh, Bravo-Large (Lubbock)
Assistant Professors: Blakely, Naylor (El Paso)

The Department of Radiology is actively engaged in undergraduate and post-graduate 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 C. R. F. Baker, M.D.
Interim Chairman
Assistant Professor Joseph Ronaghan, M.D.
Associate Chairman (Amarillo)
Professor Edward C. Saltstein, M.D.
Associate Chairman (El Paso)
Professors: Behal, Illner, Jackson, Millikan, Perry, G. T. Shires (Lubbock); Peacock (El Paso)
Associate Professors: Baker, Goldthorn, Lacey, Vordermark, Wang (Lubbock); Diaz-Ball, Dougherty, Dulaney, Mercer, White, Williams, Zolfaghary (El Paso)
Assistant Professors: Akhter, Barber, Griswold, Hagedorn, Jones, C. Ronaghan (Lubbock); Kestner, Lee, (El Paso); J. Ronaghan (Amarillo)
Instructors: Zerbach (El Paso)
Research Professors: Simoni (Lubbock)
Research Instructors: Jorgensen (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:

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.

Vascular Surgery -- This division provides a series of lectures on the fundamentals of both arterial and venous disorders to third year students. Students will become familiar with non-invasive diagnosis of peripheral vascular disease by close contact with the vascular laboratory.

Required Courses:

MGS 71827 - MGS 71227 - 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.

BIOMEDICAL GRADUATE PROGRAMS

Development of a strong program of graduate education in the basic biomedical and related health sciences necessarily 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 School of Medicine.

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 enroll simultaneously in the School of Medicine and a biomedical graduate program. A Medical Scientist Training Program (MSTP) which permits a 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 is available. A limited number of exceptionally qualified combined M.D.-Ph.D. Students in the MSTP will be designated as Medical Scientist Scholars and will receive stipend throughout the combined degree program. 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 Biomedical Graduate Program.

The graduate courses listed in this section are available, with the consent of the instructor and the Associate Dean for Graduate Studies, to graduate students at Texas Tech University.

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

Further information about graduate programs in the Health Sciences Center School of Medicine may be obtained by contacting the relevant basic science department chairperson or the Associate Dean for Graduate Studies, Texas Tech University Health Sciences Center School of Medicine.

DEPARTMENT OF CELL BIOLOGY AND BIOCHEMISTRY

Professor Harry M. Weitlauf, M.D.
Chair
Professors: Barker, Behal, Chilton, Everse, Faust, Garner, Hutson, Morrow, Norman, Poduslo, Reid, and Stocco
Associate Professors: Beale, Coates, Doris, Little, Pelley, Pence, Sridhara, Trevillyan, and Whelly
Assistant Professors: Cameron, Donahue, Droms, and Webster
Research Assistant Professor: Knisley
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.

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 bachelor's 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 commit-

tee and present the work in a public seminar.

A minimum of 60 semester hours, excluding Doctoral Dissertation (8000), 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. (ANM)

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.

5601. Cell Structure and Function - Core Course 1 (6:6:0). Topics include assembly, structure, and function of membranes, organelles and the cytoskeleton and the basic mechanisms of transcription and translation.

5602. The Cell Cycle -- Core Course 2 (6:6:0). Prerequisite: ANM 5601 or equivalent and consent of instructor. Examination of DNA replication and repair, meiosis and recombination, and mitosis and the genetics of cell cycle control.

5604. Cellular Interactions -- Core Course 3 (6:6:0). Prerequisite: ANM 5601 or equivalent and consent of instructor. Study of hormones, growth factors, mechanisms of signal transduction, cell adhesion molecules and the extracellular matrix.

5606. Mechanisms of Cellular Differentiation -- Core Course 4 (6:6:0). Prerequisite: ANM 5601 or equivalent and 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.

5307. Growth Factors and Proto-Oncogenes (3:3:0). Surveys the roles of growth factors, proto-oncogenes and anti-oncogenes in the regulation of normal cell growth and differentiation. Classes will include didactic lectures along with reading and discussion of original research papers.

5308. Cellular and Molecular Endocrinology (3:3:0). An introduction to cellular signaling. The role of receptors, mechanisms of transduction of endocrine signals, gene regulation by hormones, molecular evolution, and oncogenes.

5309. Biology of Reproduction (3:3:1). 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 is required prior to registration.

***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 anatomydesigned for sports medicine with emphasis on body parts most susceptible to athletic injuries.

***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).

6301. Cardiovascular Cell Biology (3:3:0). A modern approach to normal and abnormal cardiovascular function using the approaches of cell and molecular biology.

7000. Research (V1-12).

7101. Seminar (1:1:0). The student will attend and participate in departmental seminars.

8000. Doctoral dissertation (V1-12).

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 levelling courses prescribed by the department. Students are required to take BCH 5621, 6322, 6522, 6523, 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. BCH 5621 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 chair and the Associate Dean for Graduate Studies.

Generally within 12 months after enrollment in the program, each student will take a preliminary examination in general biochemistry consisting of essay questions submitted by the faculty. 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. (BCH)

5621. General Biochemistry (6:6:0). Human life processes at the molecular level with emphasis on biochemical homeostasis and control mechanisms.

5921. 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.

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

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.

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: BCH 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: BCH 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.

6322. Biomedical Radioisotope Techniques (3:3:0). Prerequisite: BCH 5291, CHEM 4303, 4306, 4307, or equivalent. Basic radioisotope techniques as used in biomedical research with special emphasis on liquid scintillation counting techniques.

6326. Advanced Human Genetics (3:3:0). Prerequisites: A course in genetics and consent of instructor. Detailed consideration of population genetics, cytogenetics, molecular biology, and biochemistry as related to human heredity.

6522. Molecular Biology of Eukaryotes: Nucleic Acids (5:5:0). Prerequisite: BCH 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.

6523. Regulatory Mechanisms in Biochemistry (5:5:0). Prerequisite: BCH 5921 or equivalent and consent of instructor. A study of current knowledge of molecular mechanisms for the regulation of cellular processes, including both endocrine and nonendocrine mechanisms.

6533. Molecular Biology of Eukaryotes: Proteins (5:5:0). Prerequisite: BCH 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 physico-chemical methods used to characterize proteins and their molecular structure.

7000. Research (V1-12).

7101. Biochemistry Seminar (1).

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

9000. Postdoctoral Research (V1-12).

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: MIB 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.
Chair
Professors: Carroll, Lombardini, Pirch, and Tenner
Associate Professors: Freeman and K. McMahon
Assistant Professors: Crosson, Reigel, and Syapin

This department offers study in the following graduate degree programs: PHARMACOLOGY, Master of Science, 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 good teachers and investigators. Specialized research training is available in the areas of biochemical pharmacology and drub metabolism, endocrine pharmacology, calcium homeostasis, renal pharmacology, autonomic pharmacology, cardiovascular pharmacology, neuropharmacology, and molecular pharmacology.

COURSES IN PHARMACOLOGY. (PHM)

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: BCH 5921, PHY 5803, PHM 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 studied 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: BCH 5921, PHY 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 Sandra Sabatini, M.D., Ph.D.
Chair
Professors: Crass, Davies, Heavner, Lutherer, McGrath, and Orem
Associate Professors: Janssen, Laski, Nathan, H. Strahlendorf, and J. Strahlendorf
Assistant Professor: Fowler

This department offers study in the following graduate degree programs: PHYSIOLOGY, Master of Science, Doctor of Philosophy. The program is designed to train persons who will teach and conduct research in medical institutions. Training in physiology is provided with emphasis in the following fields: cardiovascular physiology; neurophysiology; renal physiology.

Applicants should have a strong interest in research and should apply primarily to the Ph.D. Program. Applications to the M.S. Program may be accepted. All candidates for graduate degrees who hold assistantships must fulfill certain requirements while appointed as assistants.

PHY 5803 is normally a prerequisite for all courses in or above the 6000 level, with the exceptions of PHY 6301 and 6302. Enrollment in PHY 5803 is limited to students admitted to degree programs and requires approval by the thesis director and the department chairperson.

COURSES IN PHYSIOLOGY. (PHY)

5402. General Physiology (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, endocrine physiology as well as neurophysiology.

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

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).

6300. Advanced Neurophysiology I: Cellular and Molecular Neuroscience (3:3:0). Prerequisite: PHY 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.

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.

6309. Advanced Neurophysiology II (3:3:0). Prerequisite: PHY 5803 and HS 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: PHY 5803 and consent of instructor. Advanced level coverage of topics in cardiovascular physiology with much material being covered in reviews of the research literature.

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). 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: PHY 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).

OTHER COURSES IN THE HEALTH SCIENCES CENTER

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

COURSES IN HEALTH COMMUNICATIONS. (HCOM)

5315. Health Communications Research (3:3:0). Critical examination and synthesis of past and ongoing research on the health communications process, focusing on mass communication research concerning health and medicine.

5319. Seminar in Current Topics of Information Sciences (3:3:0). This course will vary each semester emphasizing either information science topics or other topics in the health communications area.

5600. Health Communication Internship (6:4:0). Students will perform communication functions in health agencies for eight weeks under joint supervision of the chairperson of the student's advisory committee and an on-site supervisor.

COURSES IN HEALTH ORGANIZATION MANAGEMENT. (HOM)

5306. Medical Aspects of Health Organization Management (3:3:0). Prerequisite: MGT 5370 and admission to the MBA or MPA degree program or permission of HOM Program Director. Focusing 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. Ambulatory Health Organization Management (3:3:0). Prerequisite: MGT 5370, HOM 5306, ECO 5337, and admission to the MBA or MPA degree program or permission of HOM Program Director. A course examining key contemporary issues in the organization and management of ambulatory health care organizations, including medical practices. (MGT 5307)

5308. Health Organization Management (3:3:0). Prerequisite: MGT 5370, HOM 5306, 5307, ECO 5337, and admission to the MBA or MPA degree program or permission of HOM Program Director. Designed to provide an overview of the health care system, its managerial, social, behavioral, and economic aspects from a macroscopic viewpoint. (MGT 5308).

5309. Contemporary Issues in Health Organization Management (3:3:0). Prerequisite: MGT 5370, HOM 5306, 6307, 5308, ECO 5337, and admission to the MBA or MPA degree program or permission of HOM Program Director. Designed to analyze and evaluate selected contemporary problems, issues, and trends in organized health care delivery primarily at the micro level. (MGT 5309) 7000. Research (V1-12).

COURSES IN HEALTH SCIENCES. (HS)

5310. Management of Sports Injuries and Illnesses (3:3:0). Preparticipation examination; types of injuries and illnesses; diagnosis; early and late treatment of injuries; responsibilities of the physician, coach, trainer, and parent; and rehabilitation of the athlete.

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.

COURSES IN PREVENTIVE MEDICINE. (PVM)

6302. Medical Entomology (3:3:0). Covers human, animal, anhogen interactions with arthropod vectors, emphasizing vector ecology and parasite biology. Human disease is stressed including zoonotic aspects; veterinary entomology is not a focus. Taxonomic considerations are restricted to distinguishing the major vector species. Includes field trips to demonstrate collecting techniques and control procedures.

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 may be placed 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

Acreman, Anne E., MD; 1982, University of Texas Medical Branch, Clinical Assistant Professor, Family Medicine

Akhter, Saeed, MD; 1983, Sind Medical College, Assistant Professor, Surgery

Al-Khalil, Ihsan, MD; 1972, Damascus University Medical School, Assistant Professor, Pediatrics

Alicea, Jose A., MD; 1987, Boston University School of Medicine, Assistant Professor, Orthopaedic Surgery

Anaya, Richard, PC-A; 1991, University of Texas Southwestern Medical School, Faculty Associate, Emergency Medicine

Andrew, Leora P., MD; 1950, University of Texas Medical Branch, Associate Professor, Pediatrics

Anuras, Jitra, MD; 1968, Chulalongkorn University, Professor, Internal Medicine

Armstrong, Elizabeth S., MD; 1989, Tulane University Medical School, Assistant Professor, Obstetrics and Gynecology

Arredondo, Rudy, EdD; 1976, Texas Tech University, Associate Professor, Psychiatry

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

Arthur, Jeff M., MD; 1987, Texas Tech University HSC School of Medicine, Assistant Professor, Anesthesiology

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

Atkinson, Billy D., MD; 1982, University of Texas Medical Branch, Assistant Professor, Obstetrics and Gynecology

Badgwell, J. Michael, MD; 1971, Baylor University College of Medicine, Associate Professor, Anesthesiology

Bagg, Raymond J., MD; 1958, New York Medical College, Professor and Regional Chair, Orthopaedic Surgery

Baida-Fragosa, Nicholas, MD; 1979, Autonomous University of Guadalajara, Instructor, Psychiatry

Baker, C. Richard F., MD; 1961, The Johns Hopkins University School of Medicine, Interim Chairman; Associate Professor, Surgery

Banken, Joseph A., PhD; 1988, University of Southern Mississippi, Assistant Professor, Psychiatry

Banta, Charles J., MD; 1985, Louisiana State University, Clinical Assistant Professor, Orthopaedic Surgery

Barber, Annabel E., MD; 1985, University of Texas Medical School-Houston, Assistant Professor, Surgery

Barker, Kenneth L., PhD; 1964, Ohio State University, Vice Provost for Research (TTUHSC), Associate Dean for Graduate Studies and Research; Professor, Cell Biology and Biochemistry

Bartholomew, Bruce, MD; 1958, University of Michigan School of Medicine, Professor, Internal Medicine

Bassler, Jr., Thomas J., MD; 1985, Medical College of Virginia, Assistant Professor, Pathology

Batra, Subhash, MD; 1977, Maulana Azad Medical College, Assistant Professor, Internal Medicine

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

Behal, Francis J., PhD; 1958, University of Texas-Austin, Professor, Surgery/ Biochemistry

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

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

Binder, Louis S., MD; 1980, University of Minneapolis Medical School, Assistant Dean for Medical Education-El Paso; Associate Professor, Emergency Medicine

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

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

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

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

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

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

Boman, Darius A., MD; 1973, University of Bombay, Seth G.S. Medical College, Associate Professor and Regional Chair, Pathology

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

Braun, R. Daniel, MD; 1964, Baylor University College of Medicine, Professor, Obstetrics and Gynecology

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

Bridges, Walter, MD; 1988, Texas Tech University HSC School of Medicine, Instructor, Internal Medicine

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

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

Buell, James, MD; 1966, University of Nebraska College of Medicine, Professor, Internal Medicine

Burchfield, Daniel Mark, MD/PhD; 1987, Medical College of Ohio, Assistant Professor, Orthopaedic Surgery

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

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

Butler, Vincent Jack, MD; 1955, University of Toronto Faculty of Medicine, Associate Professor, Psychiatry

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

Cameron, Gregory S., PhD; 1983, University of Alabama-Birmingham, AssistantProfessor, Dermatology

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

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, Regional Dean-Odessa; Professor, Obstetrics and Gynecology

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

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

Castro, Manuel E., MD; 1983, Autonomous University of Chihuahua, Assistant Professor, Surgery

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

Chamberlin, Shanta, MD; 1975, University of Singapore, Assistant Professor, Pediatrics

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

Chappell, James A., MD; 1957, Bowman Gray School of Medicine, Associate Dean for Academic Affairs and Professor, Pediatrics

Chavez, Marina, MD; 1987, Texas Tech University HSC School of Medicine, Assistant Professor, Psychiatry

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

Chiodo, Louis A., PhD; 1981, University of Pittsburgh, Professor and Chairman, Pharmacology

Christenson, Robert, MD; 1980, Loma Linda University, Assistant Professor, Pediatrics

Chuachingco, Joyce C., MD; 1971, University of Philippines, Associate Professor, Pediatrics

Coates, Penelope W., PhD; 1969, University of Texas Southwestern Medical School, Associate Professor, Cell Biology and Biochemistry

Cobos, Everardo, MD; 1981, University of Texas HSC-San Antonio, Assistant Professor, Internal Medicine

Cockings, Eaon, MD; 1955, University of Manchester, Professor, Anesthesiology

Colmer, Jane, BS; 1969, University of Missouri-Kansas City, Faculty Associate, Pathology

Contreras, Salvador A., MD; 1973, University of El Salvador School of Medicine, Associate Professor, Psychiatry

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