TEXAS TECH UNIVERSITY
HEALTH SCIENCES CENTER™

Graduate School *of* Biomedical Sciences

GSBS Catalog

TEXAS TECH UNIVERSITY HEALTH SCIENCES CENTER
GRADUATE SCHOOL OF BIOMEDICAL SCIENCES
GSBS Catalog: Student Handbook, Policy Manual, and Course Listing

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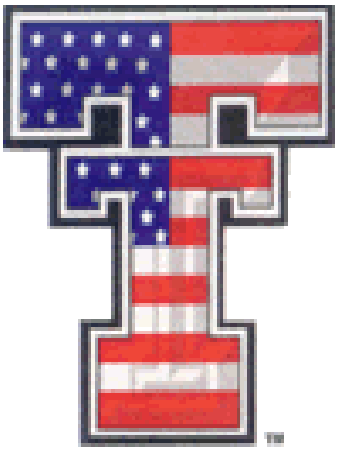


Preface

The purpose of this publication is to assemble a set of guidelines, instructions, and information concerning the operational procedures of the Graduate School of Biomedical Sciences (GSBS). The Graduate School of Biomedical Sciences reserves the right to make changes as necessary, without notice, although every effort will be made to notify programs/concentrations and students when changes are made. Specific programs (Biotechnology, Biomedical Sciences, Pharmaceutical Sciences and Public Health) or concentrations within the Biomedical Sciences program (Biochemistry & Molecular Genetics, Biomedical Studies, Cell & Molecular Biology, Cell Physiology & Molecular Biophysics, Immunology & Infectious Diseases, Premedical Sciences, Pharmacology & Neurosciences) may enact stricter guidelines and policies for their graduate students.

The Graduate School of Biomedical Sciences, Programs and Concentrations reserves the right to institute, after due notice and during the course of a student's work toward a degree, any new ruling which may be necessary for the good of the University and therefore, ultimately, of recipients of its degrees. Normally a student may graduate under the provisions of the catalog in effect at the time of enrollment in the GSBS. The GSBS also reserves the right to make changes in courses as needed. The right to make changes in tuition and fees is reserved as regulated by the Board of Regents.

Students with disabilities who need assistance should contact the Office of Students Services in Room 2C400, or by phone at 806.743.2300.

Accreditation

Texas Tech University Health Sciences Center is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award baccalaureate, masters, doctoral, and professional degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097 or call 404-679-4500 for questions about the accreditation of the Texas Tech University Health Sciences Center. The Commission should be contacted only if there is evidence that appears to support the institution's significant non-compliance with a requirement or standard.

Mission Statement

The Mission of the Texas Tech University Health Sciences Center is to improve the health of people by providing educational opportunities for students and health care professionals, advancing knowledge through scholarship and research, and providing patient care and service.

In support of the institutional mission, the **Graduate School of Biomedical Sciences** strives to provide superior graduate education as well as leadership in increasing knowledge and understanding through scholarship and research. The **mission** of the Graduate School of Biomedical Sciences is to educate the next generation of scientists and health-related professionals in a dynamic and productive research environment that fosters creativity and discovery.

The faculty and staff of the Graduate School of Biomedical Sciences are committed to:

- Providing the larger academic community, as well as future employers, with graduates who are highly competent, independent, and ethical researchers and teachers;
- Demonstrating in all pursuits honesty, integrity, trustworthiness, and commitment to academic freedom;
- Ensuring that GSBS faculty, staff, and students are supported in their efforts with state-of-the-art resources, facilities, and training opportunities;
- Serving as leaders in the community for the advancement of knowledge related to the basic biomedical and related health sciences.

Administrative Structure

GSBS is one of six schools within the Texas Tech University Health Sciences Center (TTUHSC). The primary faculty within GSBS are faculty who have appointments with either the School of Medicine (SOM); Paul L. Foster School of Medicine (PLF-SOM), or the School of Pharmacy (SOP). In order to function efficiently, the GSBS faculty and students operate daily out of the schools listed above. The Chair of each department works with GSBS to help oversee the programs.

GSBS contains three Programs of study as well as seven concentrations, which are defined under the Graduate Programs section of this handbook.

The responsibility for the Graduate School of Biomedical Sciences is under the GSBS Dean, Brandt Schneider, Ph.D. The day-to-day management of the GSBS is under the auspices of the Associate Deans: Thomas Abbruscato, Ph.D.; Michael Blanton, Ph.D.; Rajkumar Lakshmanaswamy, Ph.D.; Jon Weidanz, Ph.D.; and Assistant Dean, Pamela Johnson, M.B.A.

Graduate affairs are discussed and developed by a Graduate Council, which consists of two elected representatives from the Pharmaceutical Sciences and the Biotechnology programs; two representatives from each research concentration within the Biomedical Sciences Program; an ex officio member from the TTU Graduate School; and an ex officio graduate student member. The GSBS Dean is the Chair of the Graduate Council, which operates in an advisory capacity to the Dean.

The Graduate School of Biomedical Sciences is administratively separate from the Texas Tech University (TTU) Graduate School, however, under agreement, the TTU Graduate School administers the thesis/dissertation process for GSBS students.

Graduate Programs

The Graduate School of Biomedical Sciences has four degree programs: Biotechnology (master's only); Pharmaceutical Sciences; Public Health (master's only); and Biomedical Sciences. The Biomedical Sciences program consists of seven concentrations which are defined as the research areas within the program. Students entering into the Biomedical Sciences Program are required to select a concentration at the end of their first year.

GSBS programs leading to the M.S. and Ph.D. degrees are:

Doctoral Degrees:

- Pharmaceutical Sciences
- Biomedical Sciences *

Master Degrees:

- Biotechnology
- Biomedical Sciences *
- Pharmaceutical Sciences
- Public Health

***Biomedical Sciences:**
Areas of Concentrations include:

- Biochemistry & Molecular Genetics
- Biomedical Studies (Master's only – El Paso)
- Cell & Molecular Biology
- Cell Physiology and Molecular Biophysics
- Immunology and Infectious Diseases
- Pharmacology & Neuroscience
- Pre-Medical Sciences (Master's only)

For additional information please contact the GSBS Admissions Office at:
graduate.school@ttuhsc.edu.

For a complete list of courses and course descriptions, please see the Course Listing on page 75.

Biochemistry and Molecular Genetics (GBMG)

Douglas M. Stocco, Ph.D., Interim Chairperson for the School of Medicine Department of Cell Biology & Biochemistry

Sandra Whelly, Ph.D., Graduate Advisor

Primary Faculty: Faust, Hardy, MacDonald, Pelley, Schneider, Stocco, Urbatsch, Whelly, Williams
Associate Faculty: Chilton, Cornwall, Coué, Dufour, Kang, Lee, Maurer, Pence, Reynolds, Thomas, Webster

About the Concentration

Biochemistry and Molecular Genetics is designed to prepare students for research and teaching careers in biochemistry and molecular biology as related to the medical and life sciences. Admission requires prior coursework in mathematics, general physics, organic chemistry, analytical chemistry, and biological science. Students with deficiencies in any of these areas may be conditionally admitted pending successful completion of leveling courses. Students are required to take GSBS core curriculum or their equivalent. In addition, students are urged to take or to have successfully completed courses in physical chemistry, statistics, and computer programming.

Students 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 protein amyloidogenesis.

For more information on Biochemistry and Molecular Genetics, contact Dr. Sandra Whelly, Graduate Advisor, at 806.743.2700, Ext. 247.
Concentration Guidelines:
(PhD) http://www.ttuhsc.edu/som/cbb/documents/BMG_PhD_Guidelines_AY2014.pdf
(MS) http://www.ttuhsc.edu/som/cbb/documents/BMG_MS_Guidelines-AY2013.pdf

Biomedical Studies – El Paso (GBSE)

Rajkumar Lakshmanaswamy, Ph.D., Interim Associate Dean
Rajkumar Lakshmanaswamy, Ph.D., Graduate Advisor

Primary Faculty: Bryan, Gangwani, Garg, Hogg, Joshi, Lakshmanaswamy, Nyakeriga, Perez, Shokar, Sundin, Tarwater, Terreros, Watts, Wu, Zeng
Associate Faculty: Beale

About the Concentration

The Biomedical Studies MS program will provide foundational coursework and laboratory training in the areas of biochemistry, cell biology, and genetics in addition to elective courses that explore specialized topics, recent advances, and current literature within the field. The program is designed to provide a superior and competitive training environment in four state-of-the-art Center of Excellence research laboratory areas established at the Paul L. Foster School of Medicine / El Paso Health Sciences Center GSBS campus (Cancer, Diabetes and Obesity, Infectious Disease, and Neuroscience).

Students will be expected to engage in a mentored research project, as well as publication(s) within prominent peer-reviewed scientific journals. Students graduating from this program will be prepared for work at the forefront of biomedical research and will be highly competitive for positions in academia and industry that meet their individual interests.

Biotechnology (GBTC)

Jon Weidanz, Ph.D., Associate Dean of the Graduate School of Biomedical Sciences; Director
Ted Reid, Ph.D., Co-Director

Primary Faculty: Filleur, Reid, Rumbaugh, Tonk, Wood
Joint Faculty: Altenberg, Bergeson, Blanton, Cornwall, Dufour, Fralick, Hamood Hardy, Hawkins, Jansen, Karbowniczek, Kang, La-Beck, Lowe, Lyte, MacDonald, Markiewski, Prien, Reynolds, Schneider, Sutton, Syapin Thomas, Urbatsch, Weidanz, Williams
Associate Faculty: Bryan, Gangwani, Lakshmanaswamy, Miller, Perez, Tarwater

About the Program

This program is an interdisciplinary degree supported by all basic science departments in the Texas Tech University Health Sciences Center (TTUHSC). The Texas Tech University general academic campus administers a complimentary track in Applied Science Biotechnology.

The biomedical sciences track is a 21-month curriculum consisting of two terms (nine months) of coursework and 12 months of full-time laboratory research. It is typically a nonthesis degree with an optional thesis at the end of the second year by arrangement with the advisor. The research component may be completed either at the TTUHSC campus or at a biotechnology industry laboratory. Students who choose to do their research at the TTUHSC campus will work with a member of the biotechnology graduate faculty. All biotechnology graduate faculty have active

research programs that emphasize use of molecular biology methods. Prerequisites for the program include a bachelor's degree in science with at least one year of organic chemistry.

Program Guidelines:
http://www.ttuhsc.edu/gsbs/biotechnology/Biot_Program_Guidelines_STUDENTS.pdf

Cell and Molecular Biology (GCMB)

Douglas M. Stocco, Ph.D. Interim Chairperson for the School of Medicine Department of Cell Biology & Biochemistry

Jeffrey Thomas, Ph.D., Graduate Advisor

Primary Faculty: Chilton, Cornwall, Dufour, Hutson, Kang, Lado, Lee, Maurer, Reynolds, Thomas, Webster
Joint Faculty: Hardy, MacDonald, Schneider, Stocco, Urbatsch, Williams
Associate Faculty: Coué, Dai, Rumbaugh

About the Concentration

Cell and Molecular Biology will prepare students for careers in cellular, developmental, and molecular biology. Employment opportunities for graduates include traditional university professorships, positions in the biotechnology industry, and governmental appointments. The curriculum centers around four courses: GSBS core courses Genes, Molecules, Cells, and Advanced Cell Biology. During the first year of study, the student will progress through a minimum of three laboratory rotations in order to determine his or her research interest. Dissertation topics can be pursued in the following areas: Regulation of gene expression, RNA processing, the role of transcription factors in cellular transformation and differentiation, cell cycle, cell and molecular biology of intercellular communication, regulation and function of the actin and microtubule cytoskeleton, embryo implantation, molecular mechanisms of epididymal sperm function, proliferation and differentiation of gonadal cells, molecular basis of gamete interactions, molecular regulation of ovarian development and function, development and regeneration of the nervous system, genetics of human cancer and congenital human disorders, diagnosis and treatment of human cancer, molecular basis of sex differences in maintenance and repair of connective tissues, morphogenesis, developmental genetics, embryonic development, cellular genetics, cell biology of epithelia, immune privilege and transplantation, molecular mechanisms of ABC transporters in cholesterol homeostasis and multidrug resistance of cancer cells.

Cell and Molecular Biology offers a research track for masters students. In addition to the Ph.D., it is designed for students who need extra preparation for the Ph.D. program or whose career track is geared toward technical or staff level positions in industry or universities. Students undertake study and research in similar areas as that of the Ph.D. program.

Students with undergraduate degrees in biology and chemistry are well suited for this concentration. Please contact Jan Emets at 806.743.2701 or jan.emets@ttuhsc.edu for more information concerning admissions for M.S. and Ph.D. Website: http://www.ttuhsc.edu/cbb/.

Concentration Guidelines:
http://www.ttuhsc.edu/som/cbb/documents/CMB_PhD_Guidelines_AY2014.pdf

Cell Physiology and Molecular Biophysics (GPHY)

Luis Reuss, M.D., Chairperson for the School of Medicine Department of Cell Physiology and Molecular Biophysics

Raul Martinez-Zaguilan, Ph.D., and Michaela Jansen, Ph.D., Graduate Advisors

Primary Faculty: Altenberg, Artigas, Cuello, Fowler, Guan, Jansen, Lutherer, Martinez-Zaguilan, Perez-Zoghbi, Pressley, Reuss, Sutton
Joint Faculty: Das
Associate Faculty: Blanton, Jumper, Laski, Prien, E. Reuss, Sennoune, Terreros

About the Concentration

The concentration's main research interest is focused on membrane proteins ranging from their structure to their function in health and disease, and utilizes both cellular and molecular approaches to study these areas. The research involves, among others, the following topics: (a) ion transport and the role of ligand-and voltage-gated potassium channels in normal physiological and pathophysiological conditions; (b) structure/function correlations and structural modeling of transporters that include the sodium-potassium pump, proton pumps and multidrug-resistance proteins; and (c) structure-function studies of proteins involved in membrane traffic and fusion. State-of-the-art approaches and techniques such as X-ray crystallography, molecular spectroscopy, patch-clamp electrophysiology, and confocal microscopy are used to carry out the various research endeavors. The School of Medicine Department of Cell Physiology and Molecular Biophysics has established these research efforts.

Concentration Guidelines: https://www.ttuhsc.edu/SOM/physiology/Courses/doctoral.aspx

Immunology and Infectious Diseases (GIID)

Matthew Grisham, Ph.D., Professor and Chair for the School of Medicine Department of Immunology and Molecular Microbiology

Joe A. Fralick, Ph.D., Graduate Advisor

Primary Faculty: Brackee, Bright, Colmer-Hamood, Fralick, Grisham, Hamood, Rolfe, Siddiqui
Joint Faculty: Reilly, Rumbaugh, San Francisco
Associate Faculty: Chaffin, Cordero, Grammas, Griswold, Lyte, Reid, Schneider, Williams, Wright
Adjunct Faculty: Ahmad, Dowd, Wolcott

About the Concentration

Immunology and Infectious Diseases is designed to graduate exceptionally well trained professionals who possess the necessary background and experience for a career in research and teaching in Immunology and Infectious Diseases. Applicants are urged to possess research experience and should have a basic knowledge of microbiology and prior course work in several disciplines of biological sciences. Prior coursework in certain areas such as Microbiology (General and Pathogenic), Cell Biology, Immunology, and Biochemistry, though not a requirement, is helpful. Students with deficiencies in these areas may be admitted and required to enroll in these classes as part of their first year of graduate school.

Students have the opportunity to rotate through research laboratories (three are recommended, but not a requirement) to broaden their education and research experience, and to assist in the identification of a field of specialization for their thesis or dissertation research. Major areas of current research activities include: microbial pathogenesis, bacterial gene regulation, biofilms, multi-drug resistance, immunology (cancer and infectious diseases, tumor antigen identification, vaccines and phage and immunotherapy. For further information, see https://www.ttuhsc.edu/som/immunology.

Concentration Guidelines:

http://www.ttuhsc.edu/som/immunology/current_students/IIDpolicies.aspx

Pharmaceutical Sciences (GPSC)

Thomas Abbruscato, Ph.D., GSBS Associate Dean
Thomas Abbruscato, Ph.D., Chair, Pharmaceutical Sciences
Junxuan Lu, Ph.D., Chair, Biomedical Sciences

Fakhrul Ahsan, Ph.D., Graduate Program Advisor

Primary Faculty: Abbruscato, Ahsan, Bickel, Cucullo, Karamyan, Liu, Lu, Lockman, Mehvar, Smith, Srivastava, Srivenugopal, Stoll, Thekkumkara, Trippier, M. Wang, Weidanz, Weis, R. Zhang
Joint Faculty: Wright
Associate Faculty: Gunaje, Hale, Karbowniczik, Kwon, La-Beck, Leff, Markiewski, Moridani, J. Zhang

About the Program

Pharmaceutical Sciences encompass all those areas of pharmacy research that pertain to drug design, delivery, formulations, and therapeutics. The faculty members of the department exhibit research interests and expertise in drug design and delivery, pharmacology, pharmaceutics, pharmacokinetics, drug receptor modeling, molecular biology, biochemistry, pathophysiology, immunology and cancer biology and therapy, and medicinal chemistry. The graduate program in pharmaceutical sciences is designed to educate students for careers in pharmaceutical industry, academia, and federal agencies including the FDA. Admissions requirements include a degree in pharmacy, chemistry, biology, or related areas. Teaching and research assistantships are awarded on a competitive basis. The departmental courses are listed below. For more information contact Teresa Carlisle, graduate program coordinator, 806.414.9329 or email teresa.carlisle@ttuhsc.edu.

Program Guidelines: http://www.ttuhsc.edu/sop/graduateprogram/current/default.aspx.

Pharmacology and Neuroscience (GPHM)

Volker E. Neugebauer, Ph.D., Chairperson for the School of Medicine Department of Pharmacology and Neuroscience

Michael Blanton, Ph.D., GSBS Senior Associate Dean, Graduate Advisor

Primary Faculty: Bergeson, Blanton, Das, Dickerson, Escamilla, Freeman, Grammas, Henderson, Kruman, Lombardini, Mahimainathan, Momeni, Norman, Perez, Popp, Roghani, Syapin, Tenner, Wu, Xu, Young
Joint Faculty: Kang
Associate Faculty: Artigas, Jansen, Reynolds
Adjunct Faculty: O'Boyle, Reilly

About the Concentration

The objective is to prepare students for careers in research and teaching. The faculty of the concentration seeks to foster a creative and productive research atmosphere, to provide encouragement and positive challenges, and to equip students with the intellectual tools they will need to be effective teachers and investigators. Specialized research training is available in the areas of aging, biochemical and behavioral pharmacology, circadian pharmacology, neuro-pharmacology, and molecular pharmacology. In addition, the SOM Pharmacology and Neurosciences department

houses the South Plains Alcohol and Addiction Research Center (SPAARC), a team of graduate faculty and other investigators with research interests focused on all aspects of drug use. For more information: http://www.ttuhsc.edu/som/pharmacology.

Concentration Guidelines: http://www.ttuhsc.edu/som/pharmacology/graduate.aspx

Pre-Medical Sciences (GMED)

Vaughan L. Lee, Ph.D., Graduate Advisor

Joint Faculty: Dufour, Lee, Pelley, Webster

About the Concentration

The Pre-Medical Sciences concentration is a two year non-thesis Master of Science degree. It is designed for students whose goal is a teaching career in the anatomical sciences, or who need additional preparation for healthcare related professional schools.
Students take courses in the anatomical, biochemical and physiological sciences with the first year medical students and complete projects in modern instructional methods and design. Additionally, they will participate in the teaching mission of the medical school as teaching assistants.

Students will be required to design and carry out an education project in anatomy, biochemistry or histology under the direction of a faculty advisor. The project will be designed according to the needs of the curriculum and matched to the interest of the students.
Prerequisites for the program include a bachelor's degree in any field but must include typical science courses (chemistry, biology, zoology/animal science, etc.). A strong science background, including completion of an undergraduate biochemistry course, is encouraged.

Concentration Guidelines:
http://www.ttuhsc.edu/gsbs/documents/PreMedGuidelines_AY2014.pdf

Public Health (GSPH)

Theresa Byrd, RN, MPH, DrPH, Chair and Associate Dean for the Department of Public Health

Primary Faculty: Bard, Byrd, Coppola, Jumper, Mulla, Patterson, Peiris, Philips, Reed, Richardson, Sherwin, Smalligan, Surles, Trinidade

About the Program

The Master of Public Health degree prepares students to work in the interdisciplinary world of public health practice, where the focus is on population health rather than on individual disease states. Students may choose from two majors (Social and Behavioral Sciences, or Epidemiology) or may choose a general MPH in which they can craft the degree to suit their interests. Public Health includes five major disciplines (Social and Behavior Sciences, Epidemiology, Environmental Health, Management and Policy, and Biostatistics) and all students take core courses in the five disciplines. Students choose either a research thesis or a practice-based culminating experience project. Faculty research is focused on disease prevention and health promotion, understanding the causes of disease in populations, and health policies that improve community health. Graduates will have opportunities to work in health care settings, not-for-profit organizations, and governmental health agencies. Some students may choose a career in public health research or academia.

Program Guidelines: http://www.ttuhsc.edu/gsbs/publichealth/MPHStudentGuide.pdf

TTUHSC GSBS Catalog

Admissions

Admission to a Master's or Doctoral Program. Admission to any graduate degree program is granted by the Dean of the Graduate School of Biomedical Sciences upon the recommendation of the GSBS admissions committee and the program/concentration faculty. The applicant must be in good standing with the school last attended. Only students who have submitted completed applications will be considered for admission. A completed application consists of the following:

1. Application to Texas Tech University Health Sciences Center Graduate School of Biomedical Sciences: (preferably at least three months prior to date of intended enrollment). Applications are received online at: http://www.ttuhsc.edu/gsbs/academics/admissions.aspx. Falsification of application information will void admission to Texas Tech University Health Sciences Center. All sections of the online application must be completed, and it must be submitted **prior** to the application closing date, which can be found on the website listed above.

   Applications are made online using Merlin (the TTUHSC online application) and must be completed by the stated deadline. Review will be completed by the program/concentration and by the admissions committee, and offers will be made in accordance with the committee's recommendation and by approval of the Dean. Matriculation will occur in the Fall semester. Exceptions to these guidelines will be taken on a case by case basis; with support from a faculty mentor, and upon the admission committee's review and recommendation followed by approval of the Dean.
2. Official Graduate Record Examination (GRE) score report no more than five years old. This is a requirement for all applicants for degree programs regardless of educational background. In accordance with Texas Education Code §51.842, the applicant's performance on a standardized test is not to be used in the admissions or competitive scholarship process as the sole criterion to

end consideration of the applicant. Information about the GRE may be obtained from the Educational Testing Service, PO Box 6000, Princeton JU 08541-6000 or www.gre.org. All test scores must be sent directly from the Education Testing Service to the TTUHSC Office of the Registrar. Photocopies or scanned copies of GRE scores will not be accepted. The institution code for Texas Tech University Health Sciences Center is 6851.

3. TOEFL or IELTS: International students must submit TOEFL (Test of English as a Foreign Language) or IELTS (International English Language Testing Service) scores. Minimum acceptable scores for the Test of English as a Foreign Language (TOEFL) are 213 on the computer-based test, 79 on the internet-based test, and 550 on the paper test. The minimum acceptable International English Language Testing Service (IELTS) score is 6.5. Scores must be no more than two years old. TTUHSC's institutional code is 6851. This test is waived for citizens of countries where English is the native language, or applicants hold a four year degree from an accredited U.S. university. Applicants who have completed at least two consecutive years at a college or university in the U.S. or in an English proficiency-exempt country are also exempted from the English proficiency requirements. TTUHSC Graduate School of Biomedical Sciences considers the following countries to have English as their native language: Australia, Canada (except the Province of Quebec), Commonwealth Caribbean countries (Anguilla, Antigua, the Bahamas, Barbados, Belize, British Virgin Islands, Bermuda, Cayman Islands, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent, Trinidad and Tobago, and Turks and Caicos Islands), Ireland, Liberia, New Zealand, United Kingdom (England, Northern Ireland, Scotland, and Wales), and the United States.
4. Official transcripts:
    a. U.S. applicants must have earned a bachelor's degree from a regionally accredited institution in the United States or the equivalent of a U.S. bachelor's degree from a foreign institution and typically requires at least 120 U.S. equivalent credit hours.. U.S. applicants must submit an official transcript from each college or university attended. All degrees earned must appear on official transcripts.
    b. The applicant must have earned a bachelor's degree from a regionally accredited institution in the United States or the equivalent of a U.S. bachelor's degree from a foreign institution and typically requires at least 120 U.S. equivalent credit hours. International applicants must provide a course-by-course evaluation of all coursework taken at degree-granting institutions recognized by their government/governmental ministry. An international applicant who, because of current enrollment, cannot provide a final course-by-course transcript evaluation at the time of application must submit transcript evaluations of all completed study. Consideration may then be given for admission upon the condition that a final course-by-course transcript evaluation is provided prior to enrollment. If the transcript evaluation states that an applicant has less than 120 U.S. equivalent credit hours and lacks a U.S. bachelor's degree equivalent, then the applicant has the option to seek an alternative evaluation from another GSBS approved evaluation company and the GSBS will accept the evaluation that supports admission.
    c. Applicants must submit at least six semesters of coursework to be eligible for admission consideration. The applicant must be in good standing with all schools attended. An international applicant must provide official transcripts from attendance at any U.S. university. Texas Tech University Health Sciences Center requires course-by-course transcript evaluations and diploma information from the list of services provided on the online application. Do not send international transcripts and marksheets to Texas Tech University Health Sciences Center.
5. Reference letters: Two letters of reference are required. Applicants must submit both the recommendation form a written letter. Letters and forms should be submitted through the Merlin

application system or mailed to the address listed at the bottom of this page. Emailed reference letters and forms may be accepted if sent from the author's institutional or work email address to graduate.school@ttuhsc.edu . Reference letters and forms submitted by the applicant are not acceptable unless the original hard copy letter and form is submitted in a sealed envelope.

6. Immunization record: All applicants are required to show proof of: (Regardless of history of disease)2 immunizations for varicella (chicken pox)or a titer proving that you are immune, 2 doses of measles, mumps and rubella or a titer proving that you are immune; 2-step tuberculosis skin test within the last 12 months; hepatitis B-series; Tetanus/diptheria (Td); Tdap (Tetanus, Diptheria, and Acellular Pertussis): Adult (one time dose starting year 2005); Meningococcal Vaccine (MCV): Adults 22 and younger (vaccine within the last 5 years). Refer to immunization form on admissions application website for more information: http://www.ttuhsc.edu/gsbs/documents/forms/immunization.pdf. Applicants must submit the TTUHSC immunization form with a copy of the immunizations record or physician's letter. Provisions for immunization requirements, and implementation procedures for all TTUHSC employees, volunteers, and students come under HSC OP 75.11.
7. Bank Statement and Sponsor Financial Statement: International F1 applicants are required to submit a bank statement from an account(s) belonging to the applicant and/or applicant sponsor showing a minimum of $29,927 USD or equivalent available balance, which is the estimated amount for one year of tuition/fees and living expenses. If the applicant has a sponsor, we also require a financial statement letter from the sponsor stating their intent to financial support the applicant. Documents may be mailed or emailed to graduate.school@ttuhsc.edu.
8. Oath of Residency: All applicants must complete an Oath of Residency form provided through the online application
9. Essay: All applicants must submit a written essay through the online application.
10. Application Fee: A one-time nonrefundable application fee for graduate study (currently $45 for both domestic and international applicants).
11. Passport: A copy of an international applicant's passport assists in processing the I-20.
12. Placement Fee: A $50 placement guarantee fee is required upon an offer of admissions.
13. VISA: International students in a degree-seeking program are required to have an F1 visa. Work visas are not acceptable for matriculation. Interested students with work visas must switch to an F1 visa, or may take one class per semester as a non-degree seeking student but the course must be incidental to their work. Prospective students who are considering a visa change are encouraged to seek the advice of an immigration attorney with any concerns.
14. SEVIS – International students, exchange visitors and scholars attending school or conducting research in the United States are required to pay a SEVIS fee prior to obtaining their visas. The fee is associated with the Student Exchange and Visitor Information System (SEVIS) and took effect September 1, 2004. The SEVIS fee is not reimbursable by TTUHSC.

Application files will not be evaluated until all the above requirements have been met. Applicants will be notified when an admission decision has been made. Three general categories of criteria are used to evaluate all applicants for admission:

1. Academic records: All academic records may be considered.
2. Test Scores: Scores on the General Test of the Graduate Record Examination (GRE). Each score is considered separately with percentile scores viewed by broad major.
3. Individual Profile: Profiles may include recommendations, research background, motivation, multilingual proficiency, undergraduate institution, presentations, portfolios, and interviews. Admission committees may also consider work experience, demonstrated commitment to a particular field or study, and community involvement.

Enrollment

Students who have been granted admission to the GSBS are expected to register for course work whether or not they contemplate degree work. Failure to register in the term for which admission is granted will require the student to reapply for admission. Registration information is provided during new student orientation prior to the beginning of the Fall semester. Graduate students are permitted to register at any time beginning the first day of advance registration. Advance registration usually begins in April for the Summer and Fall semesters, and in November for the Spring semester. Online registration is available to all admitted students. Instructions for registration and add-drop procedures can be found on the registrar's website. Students applying for a doctoral degree in the Biomedical Sciences program may apply to a specific concentration, or they may apply as undeclared. Undeclared students must select a concentration by the end of their first Spring semester. Currently, the undeclared option is not available for master's students.

Core Curriculum. The Graduate School of Biomedical Sciences has a one-semester core curriculum for Ph.D. students. This curriculum was designed to give all GSBS students a unified and coordinated foundation that would serve as a basis for further study in individual disciplines within the biomedical sciences. This curriculum is designed to accommodate both undeclared students and students who have declared interests in specific concentrations. Core curriculum courses will be taken during the first semester of the first year, and include Molecules, Cells, Genes, Biomedical Seminar Series, and Introduction to Biomedical Research. Additionally, GSBS students are required to complete a course in ethics (GSBS 5101, Responsible Conduct in Research) in the second semester. The Pharmaceutical Sciences program in Amarillo has separate curriculum requirements, and therefore is not affected by the policies outlined here. For more information please see the Core Curriculum Policy.

Changes in Schedule and Withdrawal. A graduate student who wishes to add or drop a course must initiate such action with their graduate advisor. Students should follow the academic calendar for deadlines associated with add/drop and withdrawing from a course. A student who no longer attends a course without an official withdrawal will receive an F in that course.

Full-Time Study. GSBS semesters are 16 weeks (45 contact hours for a 3 semester-credit-hour course). **The general rule is that a student may not earn more than 1 hour of credit for each week of the enrollment period.** Any exceptions to this rule must have the prior approval of the GSBS Office. Normal full-time enrollment varies between 9 and 13 hours for doctoral students and 9 and 16 hours for Masters and temporary students during the regular semester. The minimum enrollment for full-time graduate status is 9 hours per semester. Full-time enrollment for the summer term is 6 hours. Normally, the maximum allowable number of hours per semester is 13 for doctoral students, 16 for Masters and temporary students, and 6 in the summer term**.** Students on fellowships, assistantships, or other appointments designed for the support of graduate study must meet full-time enrollment requirements each semester.

If a student is devoting full time to research, using university facilities and faculty time, the schedule should reflect at least 9 hours enrollment (6 hours in the summer term).

Registration in an individual study, research, or similar course implies an expected level of effort on the part of the student comparable to that associated with an organized class with the same credit value.

A doctoral student not on campus who is required to register solely for the purpose of satisfying a continuous enrollment requirement need not register for more than 1 credit hour during each term (a doctoral student not on campus who is involved in internship, research, or another type of academic study should register for credit hours in proportion to the teaching effort required of the graduate faculty).

Maximum Allowable Graduate Hours. Students not making timely progress toward completion of a graduate degree are subject to termination by the GSBS Office. The Texas Legislature has capped formula fundable graduate hours and imposed sanctions upon universities permitting registration for excess hours. Doctoral students beyond the maximum allowable graduate hours as determined by the Texas Legislature (129 hours) may be required to pay out-of-state tuition, regardless of residence status. The GSBS Office must approve exceptions or extensions in advance. (See 129 Hour Rule).

Registration. Students are required to register for appropriate courses in every semester (including summer) in which they expect to receive assistance, use the facilities of the university, or take comprehensive examinations.

The number of hours for which students must enroll in each semester depends on their level of involvement in research and their use of university facilities and faculty time. Students in residence who are devoting full-time to research should enroll for 9 to 12 hours.

Registration Without Credit (Auditing). Persons who wish to audit a course for no grade must obtain written permission from the GSBS Office and the instructor using the *Permission to Audit Course without Credit* form. Those who audit a course do so for the purpose of hearing or seeing only and will not receive a grade or credit in the course. Students auditing a course will not be listed on the class roll, and no notation of the audit will be made on the student's transcript. Students must pay a $10 fee for the privilege of auditing a course.

Registration by Faculty and Staff. Full-time members of the faculty and staff of Texas Tech University or Texas Tech University Health Sciences Center (TTUHSC) may enroll for courses by permission of the course director, and by completion of the GSBS application. In registering for graduate work, they become subject to the regulations of the Graduate School of Biomedical Sciences. However, no member of the faculty who has held rank higher than instructor at TTUHSC is eligible to pursue a graduate degree program at this institution unless prior approval of the GSBS Office is given. TTUHSC Employees may also utilize the tuition assistance program as outlined in OP 70.47 to receive tuition waivers for one course per semester. To be eligible, employees must be full-time benefits-eligible and seeking a degree or certification.

Registration by Undergraduates. An undergraduate student who is within 12 hours of graduation and who has at least a B average in their major subject may enroll for courses carrying graduate credit. The *Approval for Graduate Credit* form must be approved by the GSBS Office prior to registration. Courses taken without this approval will not be granted graduate credit. With the approval of the GSBS Office, students may take graduate courses for undergraduate credit. Students may not, however, receive both graduate and undergraduate credit for the same course, except for up to 9 hours for an approved joint undergraduate and graduate degree program.

An undergraduate who is permitted to enroll for graduate work as indicated above is required to take the Graduate Record Examinations (GRE) during the first semester of enrollment in graduate courses if the test has not been taken in the previous five years.

The maximum amount of work that may be scheduled by an undergraduate who is taking courses for graduate credit is 16 hours in a semester or 6 hours in the summer term, including graduate and undergraduate work. Undergraduates permitted to enroll for graduate courses are expected to receive their bachelor's degree within one year of the first semester of graduate enrollment.

An undergraduate may not receive credit for more than 12 semester hours of GSBS coursework completed prior to admission to the Graduate School of Biomedical Sciences as an applicant for a graduate degree.

Semester of Graduation. There are three official graduation dates: May, August and December. Every candidate for a graduate degree must be registered in the GSBS in the semester of graduation. Failure to graduate at the expected time requires additional registrations as necessary until graduation. Doctoral students who have been admitted to candidacy and accumulated 120 hours may be eligible to reduce hours during their last year (see 129 Hour Rule). Masters students are required to register for 9 hours. Off-campus students may register for 1 hour of thesis, dissertation, or research until graduation. Students receiving financial assistance should consult financial aid prior to reducing hours.

General Information

Academic Probation and Dismissal. Every student enrolled in the GSBS, whether working toward a degree or not, is required to maintain a high level of performance and to comply fully with policies of the institution. The GSBS reserves the right to place on probation, or to dismiss, any graduate student who does not maintain satisfactory academic standing, or who fails to conform to the regulations of the TTUHSC.

If a graduate student's GPA for a particular semester falls below 3.0, the student will be placed on academic probation. Additional details may be found in the Academic Probation policy.

Students who have been dismissed must appeal to the GSBS if reinstatement is desired. Procedures to appeal academic dismissal are found in the Appeals (Non-Grades) Policy. A student may also be dismissed for unprofessional conduct such as cheating or plagiarism. Appeals for this type of dismissal are subject to the provisions under the Code of Student Conduct. See the TTUHSC Student Affairs Handbook and the Dismissal Policy for further information.

Annual Review. The Graduate School of Biomedical Sciences requires faculty to conduct a formal review of their students' progress at least once a year. The "Record of GSBS Committee Meeting" should be filed with the GSBS office within 7 days of the meeting. In lieu of the form, the student's committee minutes may also be provided as proof of the meeting. Any student not making satisfactory progress toward the degree may be placed on probation and given conditions to stay in the GSBS program. Continued unsatisfactory progress in any area of a student's work will be cause for dismissal.

Attendance. Whenever attendance and/or participation forms a basis for a portion or all of a course grade, students must be provided with explicit written information (within the course syllabus) during the first week of classes. Such information shall be specific with regard to the penalty incurred for each absence and the means, if any, to compensate for the absence. It should be recognized that there may be certain situations where the student may not be permitted to make up the absence(s). Excused absences are determined by the course director.

Extracurricular Activities. Graduate students may participate in extracurricular activities within university policies. The Graduate Student Association and the Student Government Association offer many opportunities for participation. Students are also encouraged to participate in the annual Student Research Week during the first week of March. This consists of three consecutive days of poster competitions and guest seminars. Faculty will not hold classes or exams (unless an exception has been granted prior to the beginning of the Spring semester, by the GSBS Dean) during this week so that all GSBS students can participate and gain experience presenting a poster. Off-campus sites will make reasonable accommodations so that GSBS students on distant campuses may also participate.

Grades. The grades used in the Graduate School of Biomedical Sciences (GSBS) are: A, B, C, D, and F and all grades are used in computing grade point averages. Instructors may NOT choose to add a plus or a minus to the grade. Graduate credit is given for courses completed with grades of A, B, and C; however, individual program/concentrations may require a student to retake courses in which a "C" was obtained.

Graduate faculty have the option to use pass-fail grades (P and F) for individually arranged courses, professional seminars, and certain other courses. Student committees and/or the advisor (if student committees have not been established) may approve graduate students to take elective courses as pass-fail, however, no more than one-fourth of a student's course work may be graded pass-fail.

Students wishing to take a course pass-fail must get approval from their committee and notify the GSBS office prior to registering for the course. A student must declare the intent to take a course pass-fail no later than the last day on which a grade of W is automatically given for courses dropped. A student who has chosen to take a course pass-fail may not subsequently change to a letter-graded basis. Graded courses that students elect to take pass-fail will be converted using the following scale: A, B = Pass; C, D, F = Fail. A grade of F received on a course taken pass-fail will be computed into the grade point average. The names of students taking a course pass-fail will not be made known to the instructor.

The graduate faculty within the program/concentration in which the major or minor will be declared, will decide whether courses taken under the pass-fail system will count toward satisfying the degree requirements.

Grade Requirement for Graduation. The minimum requirement for graduation is a cumulative GPA of 3.0 in all courses taken for graduate credit, exclusive of the credits for the thesis/dissertation.

No final grade assigned for a graduate-level course may be raised unless an error has been made. Substituting another course for one completed with a low grade is not permitted.

Work completed at another graduate school with a grade less than B will not be accepted, nor will grades of Pass or Satisfactory. Grades on transferred work will not contribute to the grade average on courses completed at TTUHSC.

Procedures to appeal a grade may be found in the Appeals (Grades) policy.

Grading Symbols CR, I, W, and WF. The symbol "CR" (credit) is normally assigned for every enrollment in a master's thesis or doctor's dissertation section until the completed document has been approved by the student's committee and accepted by the GSBS Office. At that time a letter grade will be entered for the final enrollment. Faculty may elect to grade the last 6 hours of thesis (12 hours of dissertation) by preparing a grade change form if a portion of those hours were taken in a previous semester.

"CR" may be given by a professor when a student's work in other individual research courses is not completed but is satisfactorily in progress at the end of a semester. When the research is completed, a standard letter grade should be entered for the final semester.

The symbol "I" (incomplete) may be given by a faculty member when a student's work in a course has not been completed at the end of a semester and when failure to complete the work has been due to causes beyond the student's control. It is not used as a substitute for an F. **Only the Registrar's office can enter a grade of "I". The course director must provide a memo to the GSBS Office specifying the reasons for the grade and the work remaining to be done.** GSBS will forward the memo to the Registrar to enter the grade. If there is no action on the part of the student after one year, the "I" will automatically become an F.

When a student officially withdraws from a course by the specified date early in the term, a grade of "W" (withdraw) will be assigned. A withdrawal after the specified date will result in a grade of "W" or "WF" (withdraw/fail), according to the assessment of the student's work in the course up to the time of the official withdrawal. If the withdrawal is after the deadline for an automatic "W", the students must provide the registrar's office with completed grade change form with a grade of "W" or "WF" at the time of the official withdrawal. A student who no longer attends a course without an official withdrawal will receive an F in that course. The grade of "W" does not affect GPA, but "WF" is calculated into the GPA.

Graduation Fee. Early in the semester of graduation, the candidate will pay a graduation fee to cover the cost of printing the diploma and renting the cap and gown. This fee is paid again if the student does not graduate in the semester in which the fee was paid.

Leave of Absence. Any student who fails to register for three consecutive semesters (12 months) and who does not have an official leave of absence from study is subject to review for readmission by the standards in effect at the time of reconsideration. Official leave of absence, which is granted by the GSBS Office upon recommendation of the graduate advisor or advisory committee Chair, may be granted only in cases of serious medical conditions and other exceptional reasons. Normally, leaves of absence will not exceed one year. Leaves of absence do not extend the maximum time allowed for completion of the degree.

Proficiency in English. A student found deficient in English may be required to satisfactorily complete certain specified courses in English usage (without graduate credit) before being considered for admission to candidacy for a graduate degree.

Responsibility of Students. Each graduate student is expected to become thoroughly familiar with academic guidelines, Graduate School of Biomedical Sciences regulations, and degree requirements. Failure to follow the regulations and requirements almost inevitably results in complications for which the Graduate School of Biomedical Sciences cannot assume responsibility.

To facilitate communications, GSBS solely utilizes the TTUHSC-assigned e-mail account (i.e. first.last@ttuhsc.edu). It is the student's responsibility to check this account for important information and notifications.

A number of GSBS courses require a laptop computer and therefore it is strongly recommended that all incoming students obtain an appropriate laptop computer. You can see recommended configurations requirements page at:
http://www.ttuhsc.edu/som/cbb/documents/CMB_LaptopRequirements.pdf

Scholarships. The Graduate School of Biomedical Sciences (GSBS) seeks to continually recruit and retain the best quality students. In support of that goal, GSBS offers various scholarships throughout the year. Information about all GSBS scholarships can be found on our website under the Current Students page: http://www.ttuhsc.edu/gsbs/current/scholarships.aspx

Statement of Intention to Graduate. A student planning to graduate must file a *Statement of Intention to Graduate* with the GSBS office at the beginning of the semester of intended graduation. No candidate's name will be placed on a tentative list for graduation for any graduation date unless this statement has been received in the GSBS Office by the specified deadline. The deadline to file the intent to graduate is posted on the GSBS website under Graduation Deadlines.

A candidate who fails to graduate at the expected time is required to file a new *Statement of Intention to Graduate* for any subsequent graduation.

Students are also required to complete the HSC Intent to Graduate on the Student Services website: http://www.ttuhsc.edu/studentservices/commencement/default.aspx

Transferring within GSBS Programs/Concentrations. Students who wish to change their academic area – that is, transfer from one program/concentration to another within GSBS – should first notify their current graduate advisor of their intent to transfer. Once notification has been given, the student should contact the graduate advisor of the new program or concentration they wish to enter. If the program/concentration is willing to accept the student, the student should have the new graduate advisor approve the transfer by signing the Application for Change in Major form. Once the form has been signed by the new graduate advisor, the form must be approved by the GSBS Office.

Students can change their academic major at any time during a term; however, it will not be effective until the beginning of the following term. Only students in good standing may transfer into another academic area within GSBS. Students who have been dismissed may reapply to another graduate program through the application process, however, they are not eligible to utilize the Application for Change in Major form.

Transfer Credit. There is no automatic transfer of credit from another university toward a graduate degree within the Graduate School of Biomedical Sciences. In general, all such work is subject to review and approval by the graduate advisor within the academic area and by the GSBS Office. No work completed with a grade of less than B will be considered. All students must submit an official transcript along with the request for transfer.

Students may petition for approval of a graduate level course taken at another institution to satisfy a program/concentration requirement by providing documentation that the course is equivalent to a GSBS course which satisfies the requirement. The request to substitute a course should be submitted to the graduate advisor in the first semester after matriculation. If approved by the graduate program committee, the request will be forwarded to the GSBS Office for final approval.

Experiential credit is only approved in advance for matriculated GSBS students who may spend a semester learning research techniques in an approved laboratory outside of the institution and this must be requested in writing to the GSBS Office on a case-by-case basis. For credit to be awarded, the GSBS Office will determine how much credit may be earned and it will be awarded under a Special Topics course number.

Graduate credit is not granted for courses taken by correspondence.

Undeclared Students. Undeclared students are advised to select a concentration by the end of the Fall semester (Year 1). If that choice has not been made, the student will meet with the GSBS Dean

(or designee) no later than the start of the Spring semester for advice on selecting a mentor/concentration. Undeclared students must select a mentor and concentration by the end of the Spring semester (Year 1). To assist in making these choices there are two key procedures:

a) At the earliest possible date, whether that be before or after New Student Orientation, the GSBS Dean (or a designee) will meet with each undeclared student and advise them regarding 1st-year course selection, lab rotations, GSBS policy for selecting a concentration, and other academic issues.
b) As part of the core curriculum course- Core V: Introduction to Biomedical Research (GSBS 5275),undeclared students will receive additional advising regarding choosing a mentor and a graduate concentration and will undertake a laboratory rotation of their choosing.

Once a mentor and graduate concentration have been selected by mutual agreement between student and mentor, the "Application for Change in Major" form should be prepared by the student and relevant graduate advisor and submitted to the GSBS office for final approval of the Dean.

The requirements specified in this selection policy are intended to balance the wishes of the student with access/representation of each of the Biomedical Sciences Program concentrations.

Waiving Requirements. Each program/concentration has specific requirements of graduate students outside the general requirements of GSBS. Graduate students may petition to waive a specific requirement (a course) if the student has taken a similar course. For waiving Core Curriculum courses see the Core Curriculum policy. Approval for waiving requirements is considered within each academic area. General guidelines for this process are as follows (check with the graduate advisor for specific guidelines):

1. The student petitions their graduate advisor in writing, describing the course he or she wishes to waive and the pertinent details on the course previously taken (the course must have been completed within a certain amount of time as determined by the faculty within the academic area).
2. The student must provide an original transcript from the previous institution clearly displaying that the course was taken and satisfactorily passed with a "B" or better.
3. The student must also provide a complete syllabus for the previously taken course in order for the graduate advisor to determine if the content of the course is substantially similar to the course in which a waiver is being requested.
4. The graduate advisor will present all of this information to the graduate faculty committee who will decide if the request is to be granted or denied.
5. In cases where the graduate faculty committee cannot decide the appropriateness of the request, they may require the student to take and pass a comprehensive examination on the contents of the course.

Courses that are waived do not reflect on the student's HSC transcript nor do the credit hours count toward the degree. Documentation for waiving a course will be maintained in the student's academic area. GSBS will not receive or retain any documentation regarding requests to waive individual requirements.

Degree Programs

The Master's Degree

Prerequisites. A substantial body of undergraduate work in the major subject and considerable breadth of background are essential for graduate study. Therefore, students whose undergraduate programs are considered deficient in breadth or depth may be required to complete additional preparatory work without degree credit. Such undergraduate "leveling" courses must be completed with a grade of C or better.

Degree Checklist. It is recommended that students utilize the Degree Checklist throughout their entire study to ensure they meet required milestones for their degree.

Basic Plans for the Master's Program. The GSBS master's programs are comprised of at least 24 semester hours of graduate work (which may include a thesis) in a subject which has been approved and for which the student has, or completes without degree credit, the necessary prerequisites for a graduate major.

There are two basic plans for the master's degree:

1. A minimum of 24 hours of graduate course work plus 6 hours of thesis (6000). The courses for the master's degree with a thesis should be approved by the research mentor (committee chair) and not the graduate advisor.
2. A minimum of 36 hours of graduate course work without a thesis.

A minimum of 6 hours of research (7000) is required for the master's degree. Up to 6 hours of research may count toward the total number of hours required for the degree (24 – thesis masters; 36 – nonthesis masters). The Master of Public Health program will allow GSPH 5323 – Culminating Experience and GSPH 5320 – Public Health Practicum to count as the equivalency of 6 hours of research.

The option to offer thesis or non-thesis degrees is a program/concentration-specific decision.

Filing the Official Degree Plan and Admission to Candidacy. After the first semester of enrollment (as soon as 9 to 12 semester hours of the work listed in the degree plan have been completed), the student should submit to the Graduate School of Biomedical Sciences a *Master's Degree Plan & Application for Admission to Candidacy*. Delay in submission of a degree plan may result in postponement of admission to candidacy and graduation.

When the student receives an approved copy of the *Master's Degree & Application for Admission to Candidacy* from the GSBS Office, he or she is expected to follow it as the basis of all subsequent enrollments. Substitution of courses can be made upon submission of a signed copy of the *Changes to the Degree Plan* and the approval of the GSBS Office.

Approval of a Master's Degree Plan and Application for Admission to Candidacy form does not, however, constitute admission to candidacy for a master's degree. It merely signifies that the proposed plan will be acceptable if the student satisfies all of the regulations of the GSBS and all of the requirements connected with the degree plan.

Admission to candidacy will be automatically granted at such time as all of the following requirements have been met.

1. All conditions relating to admission to the program/concentration have been met including the submission of the *Master's Degree Plan & Application for Admission to Candidacy* form.
2. At least 9 semester hours of the graduate work required for the master's degree have been completed (exclusive of transfer courses).
3. All required leveling work has been completed with C or better grades.

4. An average grade of 3.0 or better has been maintained in all courses comprising the official program exclusive of leveling work.
5. The general field of the thesis has been stated and approved. If applicable.
6. Work to date is acceptable to the faculty concerned, as attested by their approval of the application for admission to candidacy.
7. The entire degree plan conforms to the general requirements of the Graduate School of Biomedical Sciences and the requirements of the particular degree.

Residence. Study leading to a graduate degree involves sustained residence as well as the successful completion of course work. Residence is credited for work done on the campus of Texas Tech University Health Sciences Center and for certain types of courses (theses, internships, individual study, or other such courses) when offered by TTUHSC faculty. Ordinarily, the minimum residence for any master's degree is a full academic year of graduate work completed on a TTUHSC campus. Part-time enrollment is evaluated on an individual basis.

Research Thesis and Defense. The Graduate School of Biomedical Sciences strongly encourages each student to write and defend a research thesis. No student should expect the defense to be based solely on performance in the classroom. A final public oral examination (defense) may be scheduled after the thesis has been read by the advisory committee. The examination may not be administered until at least three weeks have elapsed following the candidate's submission to the GSBS Office of the notification form giving the time, place, and other information pertaining to the defense. The instructions and forms are available on the GSBS website.

The thesis defense is conducted by the advisory committee and a representative of the GSBS Dean. All members of the committee participate fully in the examination and cast a vote. Faculty other than members of the committee may participate in the examination but have no vote in determining the outcome. At the conclusion of the defense, the *Thesis Oral Defense Signature Form* should be forwarded to the GSBS Office.

A student who does not receive a satisfactory evaluation may be assessed again after an interval of four months or more. At the discretion of the student's advisory committee, a student who receives a satisfactory evaluation, but who does not graduate within 12 months, may be required to repeat the assessment.

A manual entitled *Thesis – Dissertation Formatting Guidelines* is available for additional information on writing styles for the thesis. Deadlines and more information on this process are available through the GSBS website on the Current Student page.

Non-Thesis Final Comprehensive Evaluation. The Graduate School of Biomedical Sciences strongly encourages a final comprehensive evaluation for all non-thesis students in a master's program. Thesis students typically defend their thesis in lieu of a final comprehensive written examination. The final evaluation (written or oral) should require a synthesis and application of knowledge acquired during the course of study and research leading to the master's degree.

A student is eligible to undergo evaluation only after having been admitted to candidacy by the GSBS Office. As soon as possible after the evaluation, a written report of the outcome should be sent to the GSBS Office. A student who does not receive a satisfactory evaluation may be assessed once again after an interval of four months or more. The student must earn a grade of B or better on the comprehensive evaluation to qualify for graduation. At the discretion of the program/concentration concerned, a student who receives a satisfactory evaluation but who does not graduate within 12 months may be required to repeat the assessment.

Students in the Master of Public Health program who wish to complete a project rather than a research thesis should form a committee of at least two faculty who are interested in the proposed project and willing to work with the student. These faculty members will work with the student to develop a grading rubric before the student begins work on the project. The student must submit to the committee the goals and objectives of the project before beginning work on the project, and the faculty must sign off on these goals and objectives.

Oral Report: Students choosing a project will present an oral report of their project to the faculty and students. Students should arrange to have the time and date of the presentation posted at least one week before the scheduled presentation.

Final Written Report: While students that select the Non-Thesis Option are not required to write and orally present a research thesis, the program does require submission of a final written report of the outcome of the project.

Time Limit. Work credited toward a master's degree must be completed within six years. GSBS students whose graduate study is interrupted by military service will be granted an extension of time for the period of their military duty, not exceeding five years.

Switching from M.S. to Ph.D. track. M.S. students wishing to be considered for the Ph.D. program must have completed two semesters (Fall and Spring) of course work within the GSBS. Once second semester grades are available in the Banner system, the concentration may request admission to the PhD program via the online Fast-track admissions process (submission should include a copy of the transcript and a letter of support from the program advisor). A majority vote from the GSBS Admissions Committee in favor of the program switch is needed for a positive recommendation to be forwarded to the GSBS Dean or designee (Associate Dean). Decisions by the Dean may be made as early as June, however, the effective date for the official switch to the PhD program will be September 1. Students approved to switch from M.S. to Ph.D. will receive 1 year of stipend support from GSBS followed by a 50/50 split (GSBS / PI or department) until completion of the doctoral requirements. The GSBS will not support a student beyond 4 years after the switch to a Ph.D. program. Funding from the GSBS will always begin September 1. Departments or grants may pick up funding over the summer term once the Dean has approved the request. Once the GSBS Admissions Committee approves the switch to the PhD program with a stipend, the Core Curriculum Coordination (CCC) Committee will review the student's coursework to determine if the student needs to take any core courses.

Note: Current students that complete a master's degree within a GSBS concentration and wish to apply to the doctoral program in the Fall may do so by reapplying to the GSBS. If accepted into the doctoral program, the research assistantship will be funded by the GSBS for 2 years followed by a 50/50 split between the GSBS and the department/PI. GSBS only admits during the Fall semester. Any exceptions to the admissions policy must be approved by the GSBS Dean and summer funding is the responsibility of the department.

The Doctoral Degree

Admission to Doctoral Study. Admission to doctoral study is restricted to applicants whose backgrounds show definite promise of success on this, the highest level of academic endeavor.

Degree Checklist. It is recommended that students utilize the Degree Checklist throughout their entire study to ensure they meet required milestones for their degree.

Years of Study. A minimum of three years of graduate study beyond the bachelor's degree is required for the doctorate. Work completed for the master's degree may be considered as a part of this period if it forms a logical sequence in the entire degree program. Ordinarily, credit will not be given for work completed more than seven years prior to admission to the doctoral program at TTUHSC. Exceptions to this policy will require written justification by the graduate advisor and approval by the GSBS Dean following review by the Core Curriculum Committee.

Work completed in the doctoral program of another recognized graduate school will be considered on the recommendation of the graduate advisor, but no assurance can be given that such work will reduce the course or residence requirements. In no case can transferred credit reduce the minimum residence (see Residence Requirements).

Doctoral study cannot be calculated solely in terms of credit hours, but the program for the doctorate requires the completion of 72 or more semester hours of work beyond the bachelor's degree. Typically the 72 credit hours is broken down into 48 didactic hours; 12 hours (maximum) of research and 12 hours (maximum) of dissertation. Prior approval by the Dean is required for any exceptions.

Major and Minor. The GSBS does not require a formal minor, however, the student may pursue a minor or one may be required by the student's advisory committee or by the graduate faculty in which the major is taken. If a minor is taken, it must include at least 15 graduate hours in a program outside the student's major. The minor will be declared in the student's Program for the Doctoral Degree. Please note that 15 hours in another concentration does not meet the requirements of courses outside the student's major. If a minor is taken, the major requires a minimum of 45 semester hours. Taking a minor does not extend the number of hours allowed by the 129 Hour Rule.

Courses listed for the major will be primarily in one academic area. However, courses from other academic areas may be included if they provide coherent support for the courses in the major. If a formal minor is declared, a faculty member with advanced knowledge in the area of the minor must be represented on the student's doctoral committee and material from the minor must be covered on the qualifying examination.

Residence Requirement. The intent of doctoral residency is to ensure that doctoral students benefit from, and contribute to, the complete spectrum of educational and professional opportunities provided by the graduate faculty. When establishing residency, the student should interact with faculty and peers by regularly attending courses, conferences and seminars, and utilize the library facilities and resources needed to support excellence in graduate education. Doctoral candidates must complete at least three (3) years of full-time graduate level work beyond the baccalaureate degree (or one year beyond the master's degree), of which at least one academic year – the residency year – must be spent in residence on the TTUHSC campus. The residence requirement is fulfilled by the completion of at least 9 hours of course work in each of the two long terms and 6 hours in the summer. Other patterns for fulfilling residency requirements require approval of the GSBS Office.

Filing a Degree Plan. The *Doctoral Degree Plan* will be submitted to the GSBS during the Spring semester of the second year of work. Revisions of the plan are permitted as needed by submitting the *Changes to the Degree Plan* form.

Advisory Committee. As soon as an applicant's program/concentration has been determined, an advisory committee of at least four members of the graduate faculty will be appointed by the GSBS Office on the recommendation of the graduate advisor. This committee will meet at least annually with the applicant and will direct his or her work at all stages. The expectations of committee members, the advisor, and the Dean's representative are available on the GSBS website. The Chair of a student's committee must hold a primary or associate appointment in the program/concentration from which the student will receive the doctorate. Students may elect to have a co-Chair, who must have a graduate faculty appointment. It is strongly recommended that one of the committee members be outside the student's concentration and preferably a prominent scientist from another institution in the field of the dissertation research.

Qualifying Examination. The Qualifying Examination for Admission to Candidacy for the doctoral degree is one of the major features of the doctoral program and will be administered in the major area of study. The examination requires a synthesis and application of knowledge acquired during the course of study for the doctoral degree; consequently, satisfactory performance in course work does not necessarily guarantee successful performance on the Qualifying Examination. The purpose of the Qualifying Examination is to ensure that students have mastered the fundamentals in a major area of interest, and they are adequately prepared to begin working full-time on doctoral research.

A student is eligible to stand for this examination after receiving approval of the doctoral degree plan from the GSBS Office and completing most of the course work prescribed by the approved plan. Students may take the Qualifying Examination as soon as they have completed core coursework, however, it must be completed by the end of the third year. There will be no additional exams given after the deadline. Each exam component (written and oral) can be remediated once. A petition for an extension should be made by the mentor and approved by the Dean of the GSBS. Failure to pass both exam components before this deadline will result in termination of the student from the Biomedical Sciences program/GSBS. If a student fails the qualifying examination, but is in good academic standing, the student may graduate with a Non-Thesis M.S. degree, if all requirements are met. The topic of the qualifying exam may be on any relevant research area. The research topic may not be the aims of an existing or submitted research proposal from the mentor or anyone other than the student. The qualifying exam will be written in the NIH R01 format. It should contain an abstract/project summary, specific aims and research strategy.

The Examination Committee composition will be determined by the mentor and the student. There will be 5 to 6 voting members on each committee including the mentor. At least 2 of the members must be from outside the concentration. The Chair of the Committee will be elected by the committee members. The mentor is ineligible to be the Chair. The Graduate Advisor will be notified of the qualifying exam committee no later than 3 months prior to the examination.

The Examination Committee votes (pass/fail) on each exam component. If a student receives more than one negative vote for one component, this will constitute failure of the respective exam component. The written exam must be passed before the oral exam will be given. An overall pass in the oral exam constitutes passing the Qualifying Exam.

The oral exam should be presented as a typical public seminar (40-45 minutes) followed by an open Q&A discussion that will not exceed 15 minutes. This presentation will be followed by a closed-door committee examination.

The exam timeline is as follows:

1. Year 1(defined as the year when Ph.D. students enter the GSBS; for M.D./Ph.D. students, Year 1 begins upon entering the PhD portion of the program, after 2 or 3 years of medical school and having completed USMLE Step 1), Summer Semester or later: Mentor and Student assemble the members of the Examination Committee.
2. At least 3 months prior to the qualifying examination, the Examination Committee is complete.
3. The student prepares and submits a one page abstract/Specifics Aims of the proposed topic to the committee for approval.
4. Once approved, the student submits the written exam within 8 weeks.
5. After the written exam is submitted, the Examination Committee submits within 2 weeks a pass/fail form with justifications to the chair of the committee. If a student receives more than one negative vote this will constitute failure of the written exam component.
6. The oral exam takes place within 2 weeks after receiving a passing grade on the written exam.
7. The chair of the committee submits the final votes provided by the Examination Committee to the Dean. If a student receives more than one negative vote this will constitute failure of the oral exam component.

Procedure When the Examination Is Satisfactory. If the Qualifying Examination is considered satisfactory, the Chairperson of the advisory committee will send the *Admission to Candidacy* form to the GSBS Office for consideration by the Graduate Council. This recommendation should be forwarded as soon as possible after all the above requirements have been met.

Procedure When the Examination Is Not Satisfactory. If the Qualifying Examination is not satisfactory, the Chairperson of the advisory committee will notify the GSBS Office in writing. An applicant who does not pass the Qualifying Examination may be permitted to repeat as long as it is prior to the deadline (end of the third year). . Failure to pass the Qualifying Examination within the specified time will result in dismissal from the program irrespective of performance in other aspects of doctoral study.

Admission to Candidacy. Authority for admitting an applicant to candidacy for a doctoral degree is vested in the Graduate Council. Upon receipt of an *Admission to Candidacy Request* form from the advisory committee, the GSBS Office will submit it to the Graduate Council for approval.

By written communication, the GSBS Office will transmit the results of the council's action to the applicant and to the Chairperson of the advisory committee. A student must be admitted to candidacy for the doctorate at least four months prior to the proposed graduation date.

Dissertations. A dissertation is required of every candidate for a doctoral degree. Successful performance in other areas does not necessarily guarantee the acceptance of a dissertation. Additional information such as formatting guidelines, posting public announcements and grading requirements are outlined in the Dissertations & Theses policy.

Final Defense. A final public oral examination, usually over the general field of the dissertation is required of every candidate for the doctorate. It may be scheduled a suitable time after the dissertation (not necessarily the final copy) has been read by the advisory committee. The TTU Graduate School requires three weeks notification prior to the oral examination. The required *Doctoral Exam/Defense Notification Form* noting the time, place, and other information pertaining to the examination is available on the GSBS website. The examination is conducted by the advisory committee and a representative of the GSBS Dean. All members of the committee participate fully in the examination and cast a vote. Faculty members other than members of the committee, including the Dean's representative, may participate in the examination, but have no vote in determining the outcome. At the conclusion of the examination, the Chairperson of the advisory committee will send

the *Dissertation Oral Signature Defense Form* to the GSBS Office, giving the result of the examination.

Publication of Student Work. Research is an integral facet of graduate study, and students are encouraged to seek publication of work done in pursuit of advanced degrees. PhD students within the Biomedical Sciences program must publish at least one peer-reviewed original research paper prior to graduation or have the Dissertation Committee Chair request a waiver by the GSBS Dean. . In research where close collaboration with faculty advisors occurs, it is entirely appropriate in some disciplines for publications to be coauthored. In those disciplines where authorship order is not always alphabetical, the student will generally be first author in publications resulting from a thesis or dissertation. In cases of considerable revision or addition of other data, order of authorship should be subject to mutual agreement, based on the nature and extent of contribution by the parties concerned, and in accordance with accepted practice in the discipline.

The faculty member may choose to use the data in pursuing publication when the student was supported in full or in part by the university or through a faculty grant to do the research involved, or when a faculty member contributed to the work in a way that is substantially above and beyond that normally expected of a major advisor, and the student elects not to pursue publication within a reasonable time, the faculty member must list the student as coauthor according to the conventions of the discipline involved and the relative extent of contribution or additional work required.

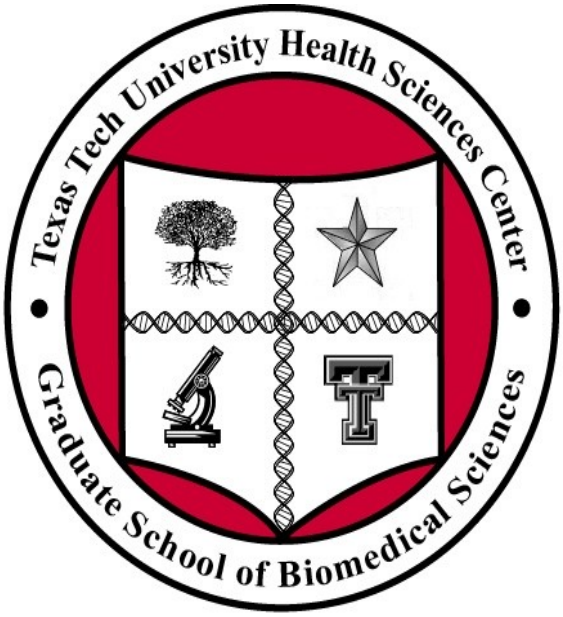
Time Limit. All requirements for the doctoral degree must be completed within a period of eight consecutive calendar years, or four years from admission to candidacy, whichever comes first. Graduate credit for course work taken at TTUHSC more than eight calendar years old at the time of the final oral examination may not be used to satisfy degree requirements. Absent an extension, the student may be permitted to retake the Qualifying Examination, and upon passing that examination, be readmitted to candidacy by the Graduate Council for some period of time not to exceed four years.

The GSBS Oath

I acknowledge that the mission of scientific research is a true and noble calling to discover truths that are hidden, and to reveal wisdom yet unknown; always for the greater good. I welcome the privilege and opportunity to join in this mission, and to dedicate the talents that I have and the education that I have gained to this higher purpose. Moreover, I pledge to use this knowledge and wisdom I have achieved only for the improvement of life. In this journey of discovery, I promise to always be honest, accurate, and fair, in all things and in all matters, and to always conduct my affairs with excellence and ambition.

The GSBS Symbol

Symbol Description:
The shield of the GSBS represents our dedication to protect life through scientific advancements in research. The double helix divides the shield into four quadrants and connects all forms of life. At the top left, the tree symbolizes the scientific process, where knowledge has deep roots, and a strong base, and the thin branches of solitary ideas give rise to seeds, which leave the tree and start new lines of thought. The star at the right represents the direction a scientist must follow as new avenues of research are revealed to us. At the bottom left, a microscope shows the scientists' commitment to look deeper for explanations. The Double T at the bottom right represents Texas Tech University Health Science Center, the institution that has taught us these lessons.



POLICIES and PROCEDURES

129 Hour Rule

Purpose: To define enrollment limits sanctioned by the Texas Legislature and outline the process for doctoral students approaching maximum limits. Master's students may not reduce hours unless they are designated by the GSBS office as "off-campus" students. Master's students that are designated as off-campus students should review the guidelines under "semester of graduation" within the Enrollment section. Reduced enrollment hours may affect financial aid status; students are encouraged to check with financial aid, scholarship and loan officers before taking the reduced hours.

1. The degree plan for **doctoral students** must be submitted by the end of the second year of doctoral work. Each program document must be signed by the graduate advisor certifying that the degree will be completed within the maximum fundable hours. The program document will be forwarded to the GSBS Office for final approval and implementation.

2. A formal review of all doctoral students will be instituted annually by the student's graduate advisory committee:
   a. If progress is satisfactory, there must be a report, signed by the committee Chairman and the graduate advisor, which will be forwarded to the GSBS Office.
   b. If progress is unsatisfactory, the student may be terminated;
   c. Accumulation of excessive hours while failing to complete the degree will constitute unsatisfactory progress.

3. Minimum enrollment for:
   a. On-campus, non-assistantship students will be 6 hours in the regular semester (3 hours in the summer term).
   b. Students with assistantships will be 9 hours in each regular semester (6 hours in the summer term).

4. Once a student has passed candidacy and accumulated 120 hours, the student may register for 3 hours each semester for up to one year.
   Ex. 3 hours- Fall; 3 hours – Spring; 3 hours - Summer

   NOTE: If student elects the 3-3-3 enrollment and does not complete the degree requirements within that period, the student must resume full-time status (9 hours per long semester).

5. Students accumulating 130+ hours will pay out-of-state tuition (full-cost) and forfeit any GSBS state-funded Research Assistantship.

6. Out-of-state tuition may be waived for students exceeding 130 hours if those students entered the doctoral program with excessive hours from a master's degree. Requests for tuition waivers must be approved by the GSBS Office.

7. Students must be admitted to candidacy at least four months prior to graduation.

8. All requirements for the doctoral degree must be completed within a period of eight consecutive calendar years.

Academic Probation

Purpose: To ensure understanding of the academic performance standards set forth by the GSBS.

Every student enrolled in the Graduate School of Biomedical Sciences (GSBS), whether working toward a degree or not, is required to maintain a high level of performance and to comply fully with policies of the institution. The Graduate School of Biomedical Sciences reserves the right to place on probation or to dismiss any graduate student who does not maintain satisfactory academic standing or who fails to conform to the regulations of TTUHSC.

1. If a student's graduate GPA for a particular semester falls below 3.0, the student will be placed on academic probation. The student must make a 3.0 GPA or better in the next semester in which he or she is enrolled. Failure to do so, or to maintain a 3.0 current GPA in each succeeding semester, may result in academic dismissal from GSBS. Regulations governing scholastic probation are based on semester grade-point averages and will be applied regardless of overall grade-point average.
2. Academic programs or concentrations may apply standards for probation and suspension higher than those established by the Graduate School of Biomedical Sciences. Such standards are to be approved by the GSBS Office, and actions based thereon are to be recommended by the graduate advisor and forwarded to the GSBS Office.
3. The minimum requirement for graduation is a cumulative GPA of 3.0 in all courses taken for graduate credit, exclusive of the credits for the thesis/dissertation.

Any student who has been suspended must appeal to the GSBS Office if reinstatement is desired. Refer to the Appeals (Non-Grades) policy for specific details and procedures.

Admission to Doctoral Candidacy

Purpose: Admission to Candidacy indicates that a doctoral student has completed all coursework and has passed a comprehensive exam attaining the graduate level to begin working on their dissertation manuscript.

Completing the Admission to Candidacy Form

STEP 1: Verify the student is eligible for candidacy.

- A Doctoral Committee must be appointed prior to Admission to Candidacy
- Students must have successfully completed the comprehensive Qualifying Examination certified by the doctoral committee.
- All enrollment requirements for admission to candidacy have been met and the student:
  - Has been continuously enrolled since entering the program
  - Has no "I" on their record
  - Has a minimum 3.00 overall GPA
- The student's degree plan must be on file with the GSBS office.
- Once candidacy is approved, the student may enroll in dissertation hours in the following semester. Students may not enroll in dissertation hours until the semester following effective admission to candidacy. Once the student enrolls for dissertation hours, they must be continuously enrolled in dissertation hours every semester until graduation.

STEP 2: Complete the Admission to Doctoral Candidacy form

STEP 3: Approvals (completed by the GSBS Office)

- **GSBS Graduate Council Rep**: Signed after approved at Graduate Council meeting
- **GSBS Office:** Signed after approved at Graduate Council

Student Complaints

Purpose: To define the process for students to resolve and/or file a complaint regarding all academic issues except for Academic Dishonesty (see the TTUHSC Code of Student Conduct).

It is the policy of the Texas Tech University health Sciences Center Graduate School of Biomedical Sciences to affirm the right of its students to a prompt and fair resolution of an academic complaint or grievance. The Student Hearing committee will administer the GSBS's policies regarding student grievances and will insure that due process is afforded to all concerned.

All student disciplinary hearings are closed, and for purposes of release of information regarding such hearings, such information is protected from public disclosure.

Grade Appeals: A student must file a formal written grade appeal within five (5) days of the beginning of the next semester. A grade can be formally appealed only when there is demonstrable evidence that prejudice, arbitrary or capricious action on the part of the instructor has influenced the grade. The burden of proof that such an unfair influence has affected a grade rests with the student who appeals the grade.

Faculty members are vested with the authority to establish course requirements and standards of performance. It is the responsibility of faculty to articulate and communicate course requirements and standards of performance to students at the beginning of each course and apply all grading criteria uniformly and in a timely manner. Final grades posted online by faculty are presumed to be accurate and final. A student, who has questions about a grade received in a course, should ordinarily seek to resolve the issue by first consulting with the instructor. If the issue has not been resolved after consultation with the instructor, and the student believes there are grounds for appealing the grade, the student may invoke the procedure outlined below.

The complaint policy is not applicable when it is the instructor's judgment about the quality of the student's work that is at issue. The assessment of the quality of the student's academic performance is one of the major responsibilities of TTUHSC faculty members and is solely and properly their responsibility.

During the academic complaint resolution process a student may enroll and attend didactic courses and is responsible for all tuition and fees.

PROCEDURE (Grade and Non Grade Complaints):

Early Resolution

1. Prior to filing a request for a hearing, the student must attempt to resolve the issue with the individual(s) involved.

2. If not satisfied with the outcome of the effort described in item 1, the student must contact the Graduate Advisor. The graduate advisor will investigate the complaint, attempt to reconcile differences, and find an acceptable solution. (If the grievance is against the graduate advisor, the student should contact the Department Chair).

   If the complaint originates in Amarillo, Abilene or El Paso, the student must contact the regional Associate Dean. A complaint against the Regional Associate Dean should be filed with the Assistant Dean.

3. If not satisfied with the outcome of the first two efforts, the student must contact the Assistant Dean. The Assistant Dean will investigate the complaint, attempt to reconcile differences, and find an acceptable solution. The Assistant Dean will provide a written statement of his/her recommendation to all parties, who will then have ten (10) business days* to respond. (If the grievance is against the Assistant Dean, the student should contact the Sr. Associate Dean). If the grievance is satisfactorily resolved by any of the above discussions, the terms of the resolution shall be reduced to writing and signed by the graduate student, respondent, and administrative superior involved in negotiations. Every effort should be made to resolve the issue without going beyond this level.

Formal Complaint

1. If the student is not satisfied with the Assistant Dean's recommendation, he/she may pursue the matter further by contacting the Sr. Associate Dean. The grievance must be submitted to the GSBS Office within 6 months of the time that the graduate student knows of the matter prompting the grievance, or the graduate student relinquishes any opportunity to pursue the grievance. The grievance must include a specific statement of the student's complaint, a clear and concise statement of the policy or procedures violated, an explanation of what remedy the student seeks, and a copy of the Assistant Dean's recommended resolution.
2. The Sr. Associate Dean will attempt to resolve the appeal within ten (10) class days through conferencing with the respondent and student appellant. If not resolved within 10 class days, the Sr. Associate Dean will appoint a Hearing Committee that will consider the appeal.
3. If a Student Hearing committee is appointed, they must convene within thirty (30) business days.
4. The Sr. Associate Dean will forward the request for a hearing to the appropriate faculty member who has been appointed by the Dean to serve as the Chair of the Student Hearing committee.

Student Pre-Hearing Procedure

1. Grievances shall be heard by the GSBS Student Hearing committee which shall be composed of members of the GSBS Graduate Faculty:

   Faculty who is appointed by GSBS Dean to serve as chair;
   Two students from programs/concentrations not directly involved;
   Two faculty members from programs/concentrations not directly involved;

The GSBS Dean will appoint an administrative staff person to take minutes of the meetings. This staff person will not be a voting member. Both parties can petition to have individuals selected to the Student Hearing committee.

2. At least fifteen (15) business days prior to the student hearing, the Chair of the Student Hearing committee will provide written notice to the parties of the following:
    a. Date, time and place for the hearing,
    b. Name of the members of the Student Hearing Committee
    c. Summary statement of the Hearing Request(s) and respondents response.

3. Either party may challenge in writing the impartiality of any member of the Student Hearing Committee up to three (3) business days after receiving the Hearing Notice by submitting their reasons for the challenge to the Chair of the Hearing Committee.

    Any member of the Student Hearing committee whose participation is challenged shall be required to establish to the Chair of the Student Hearing committee that the member can serve with fairness and objectivity. If the member cannot establish his or her fairness and objectivity to the satisfaction of the Chair of the Student Hearing Committee, the member in question shall be removed and a substitute will be appointed by the Dean.

4. At least seven (7) business days prior to the student hearing, all parties will provide to the Chair of the Student Hearing Committee:
    a. A copy of all written supporting documentation that the party will present at the hearing
    b. A list of witnesses to be called by the party. Each party is responsible for ensuring that witnesses are at the hearing, and
    c. The name of any advocate who will accompany the party to the hearing and whether the advocate is an attorney.

    The Chair of the Student Hearing Committee will provide all such information to the hearing committee at least five (5) days before the hearing.
5. A student hearing will be conducted in closed session. Any request for an exception must be submitted in writing to the Chair of the Student Hearing Committee, who shall render a final written decision.

HEARING PROCEDURE

6. Both parties shall attend the hearing and be offered an opportunity to state their positions, and present testimony and other evidence relevant to the case. The responsibility of establishing the validity of the grievance shall rest with the student. The evidence shall be presented by the graduate student and then by the respondent.

7. The student may have an advisor present at the hearing. The advisor must be a member of the TTUHSC community. However, if the student is also the subject of a pending criminal investigation, indictment or charge arising out of the same circumstances, he or she may be allowed to have an attorney serve as his or her advisor, at his or her own expense, to

participate in the same manner as any other advisor. If an advisor for the student is an attorney, an attorney from the Office of General Counsel shall attend the Student Hearing on behalf of the Health Sciences Center. The Health Sciences Center will provide legal counsel for the student hearing if the Student Hearing Committee Chair deems it necessary.

8. The student is responsible for presenting her or her own information, and therefore, advisors are not permitted to speak or to participate directly in any student hearing before the Student Hearing Committee. A student should select as an advisor a person whose schedule allows attendance at the scheduled date and time for the student hearing, as delays will not be allowed due to the scheduling conflicts of an advisor, except at the discretion of the Student Hearing Committee Chair upon written request seven business days in advance of the date scheduled for the student hearing.

   Members of the Student Hearing committee may question all witnesses, followed by the parties. Questioning by both parties may be limited by the sole discretion of the Chair of the Student Hearing Committee for such issues as preserving the civility of the hearing, avoiding redundant and irrelevant questioning, and/or providing for the efficient administration of the hearing. Witnesses are permitted to attend the student hearing only during the time they are providing testimony, or are being questioned by either party or the committee unless the Student Hearing Committee Chair, in his/her sole discretion determines otherwise.

9. Both parties may arrange for witnesses to present pertinent information to the Student Hearing Committee. Both parties are responsible for arranging for the voluntary attendance of his or her own witnesses.

10. In its sole discretion, the Student Hearing Committee may call other witnesses not identified by either party. If prior to the hearing the Student Hearing Committee anticipates calling additional witnesses, the committee shall notify the Student Hearing Committee Chair. The Student Hearing Committee Chair will then arrange for the voluntary attendance of the witnesses identified by the Student Hearing Committee. The Student Hearing Committee Chair shall notify both parties of the additional witnesses. If any witness call by the Student Hearing Committee intends to present written information to the Student Hearing Committee, the Student Hearing Committee Chair is responsible for forwarding such information to both parties and the Student Hearing Committee prior to the hearing.

11. Following the presentation of evidence, the committee will permit each party to present a brief closing statement.

12. The GSBS shall record, either digitally, through audiotape, or otherwise as deemed appropriate the hearing committees proceeding until such time that the student hearing committee begins discussion and deliberation and prepares its Findings and Recommendations. Deliberations shall not be recorded. The record is university property. Pursuant to the Family Educational Rights and Privacy Act of 1974 (FERPA), as amended, the student will be allowed to review, but not to copy, the hearing record 34 C.F.R 99.10

(2003). Neither party nor any witnesses are permitted to make any independent record of the proceedings.

13. The Student is expected to attend and participate in the Student Hearing committee. If either party elects not to attend a hearing after appropriate written notice, the case will be reviewed as scheduled on the basis of the information available, and a recommendation will be made by the committee. Although no inference may be drawn against the student for failing to attend a hearing or remaining silent, the hearing will proceed and the conclusion will be based on the evidence presented. No decision shall be based solely on the failure of the student to attend the hearing or answer the charges.

Hearing Committee Finds and Final Disposition

After completion of the hearing, the hearing committee shall adjourn and meet in closed session to discuss, deliberate and prepare the Finding and Recommendations. The Student Hearing Committee will determine the recommendations by a simple majority (more than half of the votes cast) of members present at the hearing. The Hearing committee's Findings and Recommendations Report shall be forwarded to the Dean, a copy is also sent to both parties for review and determination of necessary action. The Dean will forward a letter to all concerned parties, enclosing copies of the Hearing committee report, and directing what action will be taken within 10 business days from the conclusion of the hearing. This letter will be sent via certified mail to the student's last known official, mailing address as provided by the student to the Registrar's Office and electronically to the student's HSC email account. The decision of the Dean regarding the hearing committee's findings of fact and recommendations will be final.

Appeal

Within ten (10) business days of receipt of the decision of the Dean, if either party believes that the *due process* procedures have been violated, an appeal may be made, in writing, to the President of the University. The President will review the case and notify all parties of his or her decision within ten (10) business days. If a written appeal is not submitted within ten (10) business days following receipt of the Dean's letter, the right to appeal is thereby waived and the Dean's decision is final.
Either party may only raise, and the President shall only consider, the following:

a. Whether a procedural deviation occurred that substantially affected the outcome of the case;
b. Whether there is new information sufficient to alter the Findings or other relevant facts not available or mentioned in the original hearing, because such information and/or facts were not known to the person appealing at the time of the original Student Hearing committee.

The President will review the Findings and Recommendations and, at his or her sole discretion, the record from the Student Hearing committee and supporting documents, and transmit his or her decision in writing to both parties, the Student Hearing Committee Chair, and the Dean. The President's decision shall be final.

CONFIDENTIALITY

The Student Hearing Committee shall not retain in their possession any personal files, materials received during the appeal procedure, or notes taken during the hearing. The administrative staff person will collect all materials and return them to the GSBS office to retain in a confidential file.

No part, committee member, or other participant or observer in the hearing procedure shall reveal any facts, documents, or testimony gained through participating in or observing the hearing to any other person, unless required by a court of law to do so or upon the advice of the TTUHSC's legal counsel.

** Throughout this document, the phrase "business days" refers to days when the Graduate School of Biomedical Sciences administrative offices are open, and excludes weekends and holidays.*

Core Curriculum

**This policy applies only to the GSBS Ph.D. program in Lubbock, Texas.*

Overview

All biomedical science fields recognize the need for high levels of integration of scientific knowledge to accelerate opportunities for basic and translational research. Toward that end, full-time research is preceded by a curriculum that introduces scientific facts and provides opportunities for the development of critical thinking, synthesis of information, development of factual knowledge, and the ability to read and comprehend original literature. These skills serve as a foundation for all concentrations/programs in the GSBS.

Curriculum Design and Courses

The Core Curriculum consists of the five Core Courses taken in the first semester. GSBS requires that all doctoral students take all core courses in the first semester of enrollment and Responsible Conduct of Research in the second semester.

CORE CURRICULUM COURSES:

1. **GSBS 5471 — CORE I: MOLECULES –** This course offers a broad coverage of biochemistry with an emphasis on structure and function of macromolecules, biosynthesis of small molecule precursors of macromolecules, and the pathways of intermediary metabolism.
2. **GSBS 5372 — CORE II: CELLS –** The structure/function relationships that underlie basic cellular processes, including translation protein trafficking, cytoskeletal organization and motility, cell adhesion, and cell division.
3. **GSBS 5373 — CORE III: GENES –** Teaches essential scientific concepts underlying the field of Molecular biology and Molecular Genetics.
4. **GSBS 5174 — CORE IV: BIOMEDICAL SEMINAR SERIES –** Students will attend and participate in seminars.
5. **GSBS 5275 — CORE V: INTRODUCTION TO BIOMEDICAL RESEARCH –** Introduces the first-year graduate student to the fundamental principles and techniques in basic biomedical research.

<u>OPTING OUT OF CORE CURRICULUM COURSES.</u>

Students who have a master's degree in a biomedical or biological sciences discipline may request to opt out of individual core courses. A waiver requires to the GSBS Dean must come from the student's graduate program/concentration advisor or in the case of undeclared students from the GSBS Associate Dean. When applicable, the request should include a course syllabus and grade

received for each course that is considered equivalent to the core courses for which a waiver is requested (for transfer credit, a syllabus and grade are required). The waiver request must be made prior to the first day of class. The request will be reviewed by the core Director of the course requesting to be waived, and the recommendation evaluated by the Core Curriculum Coordination (CCC) Committee. The GSBS Office will notify the student and graduate advisor prior to the 12th day of class. During the time prior to the waiver, the student must audit the Core Course for which a waiver is requested.

PROBATION AND DISMISSAL

- GSBS students are required to maintain a minimum overall grade point average (GPA) of 3.0. If a student fails to maintain the required minimum GPA, she or he will be placed on academic probation. For more information, see the academic probation policy.
- Students may also be placed on probation for not completing the Core Courses within the first semester.
- Students may not drop a Core Course for academic reasons (reasonable exceptions will be made for sickness, etc., at the discretion of the GSBS Dean).
- Students receiving a grade of C or below in Core Course I, II or III will be required to repeat the course.
- Students receiving grades of C or below in two or more Core Courses will be at risk of dismissal.

TUTORING. One-on-one tutoring is available through the GSBS. Students should contact their mentors and the GSBS Assistant Dean when tutors are needed. Some group tutoring is also available and conducted by course directors or organized through the graduate student association (GSA).

OTHER REQUIREMENTS. All GSBS students are required to take the ethics course (GSBS 5101, Responsible Conduct of Research). Most programs/concentrations also have a statistics course requirement; GSBS offers the GSBS 5310 Introduction to Statistical Methods course, though other courses may meet the requirement.

Core Curriculum Coordination (CCC) Committee

The duties of the CCC Committee are to provide leadership and organization of the courses and other educational experiences required of first-year, first-semester GSBS students in the Biomedical Sciences program. This committee is composed of the course directors from the GSBS first-semester core curriculum in the Biomedical Sciences. A graduate student member and an additional faculty member not involved in administration of a first-semester core course are also members. Both Directors and additional members are appointed each year by the Dean of the GSBS with advice from GSBS Council. The Chair of the committee is elected by its voting members. The GSBS Associate Dean responsible for curriculum is an *ex officio* member without vote. The CCC Committee will meet as needed. Clerical support for meetings will be provided by the GSBS Office Staff.

More specifically, the CCC Committee will do the following:

- Promote excellence in the biomedical sciences by developing rigorous, relevant curricula that provide the fundamentals needed by all graduates of the Biomedical Sciences program.
- Organize the scheduling of classes, exams, and alternative teaching formats to ensure orderly progression of the educational experience.
- Establish mechanisms to recruit and mentor new course directors and ensure an equitable distribution of teaching responsibilities among the various departments and concentrations.
- Work with the individual concentrations to provide and organize laboratory rotations for first-year, first-semester GSBS students.
- Report annually to the GSBS Dean and Council on the status of the core curriculum and student performance.
- Provide advice to the GSBS Dean and Council, as needed, on general education issues.

This committee charge will be reviewed and revised as needed after one year by the Dean of the GSBS with advice from CCC Committee members and Council. Subsequent charge reviews and revisions will be at three-year intervals.

Course Evaluation and Review

Purpose: To secure regular and systematic information regarding student satisfaction of courses to improve overall instructional performance.

In order to increase subsequent program/concentration effectiveness and to assess participant satisfaction with each particular course, on-line evaluations will be solicited from all students at the end of each semester. The main goals of the evaluations are to provide information to instructors about how effectively their teaching is for student learning and to help them improve their teaching.

Course Evaluations: Evaluations are conducted around the last two weeks prior to the exam week of each academic term. The GSBS office sends e-mails (including the direct link to the online survey) to students requesting that they participate in the evaluations. Evaluations are conducted in such a way as to encourage a high rate of return and thoughtful responses from students. Evaluation results and comments are available to the instructor with no identifying information; therefore, all evaluations are completely anonymous and confidential. The GSBS office maintains a separate list to record who has submitted an evaluation so reminder email can be sent to non-respondents. **Note**: Independent studies, thesis, dissertation, and research courses are not evaluated. Courses with enrollment of less than three in a semester are not released independently. The results of those evaluations are merged with the next year's results for that course and are released when there is a class cohort of more than 3 for that course.

Course reviews: Once course evaluations have been collected by the GSBS office, they are e-mailed to the course directors. The course directors have 2 weeks to have a wrap-up meeting with all instructors of the course and provide a summary (to the GSBS office) which includes 1) Changes to the course from the prior year, 2) Addressing student complaints, 3) evaluate how the course compared to last year's student evaluation, and 4) provide ideas or recommendations proposed for next year to improve the course.

The curriculum committee reviews student evaluations and the course director summaries at the end of the Spring and Fall semesters.

Curriculum committee: The curriculum committee consists of one GSBS faculty from the Biotechnology & Pharmaceutical Sciences programs and one faculty from each concentration within the Biomedical Sciences Program as well as 4 students. The positions are appointed by the GSBS Dean and serve 3-year terms. This committee makes recommendations to the course director if there are serious

issues mentioned in the evaluations. The committee also compares prior year evaluations to verify that issues have been addressed.

Distribution of results: Results shall be reported according to the following guidelines:

- Department Chairs, graduate advisors and course directors will receive only the evaluation summaries for the courses they oversee.
- Faculty providing instruction in a course will receive their individual faculty evaluation along with the overall course summary.
- Academic coordinators will receive confidential copies to file 1) in the course file (required by SACS) and 2) in individual faculty files (for promotion and review)

Use of evaluations: The curriculum committee systematically reviews evaluation results to assess program/concentration effectiveness and inform, as appropriate, graduate advisors and instructors of evaluation results and take steps to correct any deficiencies. Ongoing course evaluation helps identify potential areas for improvement, determines training effectiveness, and helps shape future curriculum and course updates.

Course File Maintenance

Purpose: To outline information that should be maintained for each course taught within the GSBS.

A completed course file is kept for each graduate course offered in the Graduate School of Biomedical Sciences. All official course files are maintained in the department in which the course is taught.

The file includes the following:

1. Course syllabus utilizing the GSBS Template available online.
2. Required assignments / notes.
3. A copy of each test administered.
4. One sample item for each course activity. Student names are to be removed from each sample and faculty are encouraged to ask the student for permission to place the item in the course file.
5. Copy of the course evaluation.
6. Roster of all faculty teaching in the course.
7. Number of students enrolled and grade distribution.

It is the responsibility of each department to maintain the course files in a locked and secure location. Each department should designate an individual who will be responsible to collect the documentation. Course directors may use the following as a guideline for gathering the information:

- Two months after the first day of class, submit the faculty roster and copies of all course materials (required assignments, lecture notes and syllabus).
- After each exam, submit a copy of the test that was administered.
- At the end of the course, the course director should submit:
  a. sample items for each course activity (such as papers, projects, exams, etc.).
  b. number of students enrolled and the grade distribution
  c. copies of the course evaluations

Departments may choose to burn all the information onto a CD. Course files should be maintained in an active file for three years and archived for an additional four years. Seven years after the course has been taught all course materials may be discarded.

Note: course files should be kept for seven years to align with Texas Higher Education Coordinating Board program review schedule and reporting.

Dismissal

Purpose: To outline conditions or circumstances that may provide sufficient cause for dismissal of graduate students.

The following conditions or circumstances may provide sufficient cause for dismissal of a student from the Graduate School of Biomedical Sciences.

Graduate students who:

- do not make adequate academic progress as defined by the program/concentration;
- do not maintain an acceptable GPA as defined by the Academic Probation Policy
- engage in academic or research misconduct; or
- engage in illegal, fraudulent, or unethical behavior as defined in the Student Affairs Handbook - Code of Professional and Academic Conduct; or
- do not complete the required core courses by the end of the second year (which includes the 5 core courses and the Responsible Conduct of Research).

There may also be other unusual situations in which a student may be dismissed. In each case, the dismissal should follow the following procedures:

Lack of Adequate Academic Progress

Failure to maintain an acceptable GPA will result in academic warning, probation or dismissal according to the GSBS Academic Probation policy. In addition, students who have not been placed on probation, but who are not making adequate academic progress, must be warned in writing of the possibility of dismissal. They will be given a clear statement about what must be done within a specified time period to alleviate the problem. These expectations must be reasonable and consistent with expectations held for all students. If the student does not meet the requirements within the time frame specified, he/she may be dismissed. Upon recommendation from the graduate advisor, the GSBS Office will notify the student of his/her dismissal. Students may appeal this dismissal following the procedures outlined in the Appeals (Non-Grades) Policy.

Academic or Research Misconduct/Illegal, Fraudulent, or Unethical Behavior

The process for dismissing students as a result of academic or research misconduct; or as a result of illegal, fraudulent, or unethical behavior is outlined in the Student Affairs Handbook - Code of Professional and Academic Conduct.

Allegations of scientific misconduct (fraud, dishonesty, scientific misconduct, or misconduct in science) will be investigated by the TTUHSC Research Integrity Officer as outlined in HSC OP 73.07 Honesty in Research & Allegations of Scientific Misconduct. Scientific misconduct is

defined as fabrication, falsification, plagiarism, or other practices that materially deviate from those that are commonly accepted within the scientific and academic communities for proposing, conducting, or reporting research. It also includes other material deviations from accepted scientific practices such as failure to report unethical research practices, obstruction of another's research, violation of confidentiality, intentional deception, omission or research dishonesty, repeated incidents of regulatory noncompliance and misuse of research funds. It does not include honest errors or honest differences in interpretations or judgments of data.

Other Situations

A regularly admitted graduate student who has not been registered for three consecutive semesters (including the summer term) is dismissed unless a leave of absence has been approved.

Any student who does not complete all requirements for a graduate degree within the time limit (See Time Limit sections: MS or PhD) will be dismissed.

Graduate Advisors may recommend dismissing students for situations other than those specified above. When doing so, the graduate advisor must notify the student in writing of the possibility of dismissal. If it is possible for the student to rectify the situation, he/she must be given a clear statement about what must be done within a specified time period to alleviate the problem. These expectations must be reasonable and consistent with expectations held for all students. If the student does not meet the requirements within the time frame specified, he/she may be dismissed.

If the situation cannot be rectified, the graduate advisor will send justification for the dismissal to the GSBS Office. If warranted, the GSBS Office will notify the student in writing of the grounds for dismissal and the date when the dismissal will be effective. This will normally be the end of the semester in which the student is enrolled, but the circumstances of the dismissal will be important in determining this date.

Students may appeal their dismissal by following the procedures outlined in the Graduate Student Appeals (Non-Grades) Policy.

Dissertations & Theses

Purpose: To define requirements of the dissertations and theses for graduate students.

Defenses are generally open to the public and considered open meetings. Defenses should be scheduled during an active term and not between terms or during extended break periods.

Dissertations. A dissertation is required of every candidate for a doctoral degree. The dissertation work must earn a grade of at least B in order to qualify the student for graduation.

The Graduate School of Biomedical Sciences strongly recommends that each student be required to present and defend a dissertation proposal before his or her committee early in the course of the research. The subject of the dissertation must be approved by the advisory committee and the GSBS Office *at least four months* before the candidate's proposed date of graduation. The dissertation must demonstrate a mastery of the techniques of research, a thorough understanding of the subject

matter and its background, and a high degree of skill in organizing and presenting the materials. The dissertation should embody a significant contribution of new information to a subject or a substantial reevaluation of existing knowledge, presented in a scholarly style. The work on the dissertation is constantly under the supervision of the advisory committee and any other faculty the committee or GSBS Office may consider necessary. A copy of the dissertation should be presented to the committee members and the Dean's representative at least two weeks prior to the defense.

Thesis. The master's thesis is expected to represent independent work by the student, conducted under the supervision of the committee, and to be written clearly and concisely. As soon as the student's area for thesis research has been determined, an advisory committee will be appointed by the GSBS Office upon the recommendation of the advisory Chair. The committee must consist of at least three members of the TTUHSC Graduate Faculty. More than one disapproving vote from the committee members shall constitute failure of the examination. The student must earn a grade of B or better on thesis work to qualify for graduation. A copy of the thesis should be presented to the committee members and the Dean's representative at least two weeks prior to the defense.

Grading. Dissertation and Thesis hours are graded with a CR except for the last semester in which a letter grade is assigned. At the instructor's discretion, a letter grade may be assigned to the last 12 hours of dissertation (6 hours of thesis.)

Hours. Registration for at least 6 hours of 6000 is required for the master's thesis and at least 12 hours of 8000 for a doctoral dissertation. Once thesis/dissertation hours have begun, a student must be enrolled in such courses every semester until graduation unless granted an official leave of absence. Students may not enroll in thesis or dissertation courses before formal admission to a degree program by the GSBS Office.

Reference Manual. A manual entitled *Thesis – Dissertation Formatting Guidelines* is available. All manuscripts must conform to the published policies. The final copy of the dissertation must be submitted electronically to the ETD website. Dissertations/theses must be accompanied by an abstract of no more than 350 words.

One copy of the dissertation/thesis is required by GSBS which will be forwarded to the TTUHSC Library. Additional copies may be required by the advisory committee. The GSBS Office recommends utilizing www.thesisondemand.com to purchase bound copies. The required copy should be mailed directly to the GSBS Office at: TTUHSC-GSBS, 3601 4th Street, Lubbock, TX 79430. Once the order has been placed, a copy of the receipt should be forwarded to pamela.johnson@ttuhsc.edu.

Fees. Early in the semester of graduation, the candidate will pay the HSC Bursar's Office a document fee to cover the cost of uploading and storing the thesis to the ETD website.

Dissertation Announcements:
Coordinators should notify the GSBS office of all defenses at least 6 weeks prior to the defense for posting to the GSBS on-line event calendar. The GSBS office will forward the notification to all GSBS faculty. Faculty interested in attending the defense at an off-site location should notify coordinators at least 4 weeks prior to the defense so room arrangements can be made and techlink secured. Two (2) weeks prior to the defense, coordinators should prepare and forward a copy of the dissertation announcement template to the GSBS office for circulation to all GSBS faculty and students. GSBS will post to the announcement page; however, coordinators will be responsible for posting on the TV monitors and bulletin boards, etc.

Family Educational Rights and Privacy Act (FERPA)

Purpose: To inform the students and parents of Federal law that protects the privacy of student education records.

Overview
Family Policy Compliance Office (FPCO) Home

The Family Educational Rights and Privacy Act (FERPA) (20 U.S.C. § 1232g; 34 CFR Part 99) is a Federal law that protects the privacy of student education records. The law applies to all schools that receive funds under an applicable program of the U.S. Department of Education.

FERPA gives parents certain rights with respect to their children's education records. These rights transfer to the student when he or she reaches the age of 18 or attends a school beyond the high school level. Students to whom the rights have transferred are "eligible students."

- Parents or eligible students have the right to inspect and review the student's education records maintained by the school. Schools are not required to provide copies of records unless, for reasons such as great distance, it is impossible for parents or eligible students to review the records. Schools may charge a fee for copies.
- Parents or eligible students have the right to request that a school correct records which they believe to be inaccurate or misleading. If the school decides not to amend the record, the parent or eligible student then has the right to a formal hearing. After the hearing, if the school still decides not to amend the record, the parent or eligible student has the right to place a statement with the record setting forth his or her view about the contested information.
- Generally, schools must have written permission from the parent or eligible student in order to release any information from a student's education record. However, FERPA allows schools to disclose those records, without consent, to the following parties or under the following conditions (34 CFR § 99.31):
  School officials with legitimate educational interest;
  Other schools to which a student is transferring;
  Specified officials for audit or evaluation purposes;
  Appropriate parties in connection with financial aid to a student;
  Organizations conducting certain studies for or on behalf of the school;
  Accrediting organizations;
  To comply with a judicial order or lawfully issued subpoena;
  Appropriate officials in cases of health and safety emergencies; and
  State and local authorities, within a juvenile justice system, pursuant to specific State law.

Directory Information
Schools may disclose, without consent, "directory" information such as a student's name, address, telephone number, date and place of birth, honors and awards, and dates of attendance. However, schools must tell parents and eligible students about directory information and allow parents and eligible students a reasonable amount of time to request that the school not disclose directory information about them. Schools must notify parents and eligible students annually of their rights

under FERPA. The actual means of notification (special letter, inclusion in a PTA bulletin, student handbook, or newspaper article) is left to the discretion of each school.

For additional information or technical assistance, you may call (202) 260-3887 (voice). Individuals who use TDD may call the Federal Information Relay Service at 1-800-877-8339.

Or you may contact the following address:

Family Policy Compliance Office
U.S. Department of Education
400 Maryland Avenue, SW
Washington, D.C. 20202-5920

Graduate Academic Review

Texas Tech University Health Sciences Center Graduate School of Biomedical Sciences (GSBS) contains the following Graduate Programs: Biomedical Sciences, Biotechnology, Masters in Public Health (MPH) and Pharmaceutical Sciences. The Biomedical Sciences program consists of 7 concentrations: Biochemistry & Molecular Genetics, Biomedical Studies, Cell & Molecular Biology, Cell Physiology & Molecular Biophysics, Immunology and Infectious Diseases, Pharmacology & Neuroscience, and Pre-Medical Sciences. The graduate academic review of Biomedical Sciences will include: recruitment, admissions, the Integrated First Year Core Curriculum, and the assessment of the individual concentrations. References within this document to "program", refers to Biotechnology, Biomedical Sciences, MPH and Pharmaceutical Sciences.

Purpose: The main objective of ongoing, continuous assessment is to provide a mechanism for improving the quality of graduate program/concentrations at Texas Tech University Health Sciences Center Graduate School of Biomedical Sciences (GSBS).

Graduate Academic reviews consist of two interrelated activities. The first is a formal review, which occurs every 7 years. The second is continuous, ongoing assessment of key program/concentration outcomes, as identified by the graduate faculty of each academic area. Collection and analysis of data related to these outcomes, as well as resulting changes, are reported to the GSBS Office annually. At the time of the next formal review, summaries of these reports will be included in the self-study.

The formal review process comprises five major components: (1) a self-study prepared by the graduate faculty, (2) an external review committee (ERC), (3) an internal review committee (IRC) evaluative report and recommendations, and (4) program and concentration faculty's response to that report, containing an action plan. The action plan is developed from a post-review meeting of the graduate advisors, Department Chairs and the GSBS Associate Dean. Annually, through the use of Weave Online, the program/concentration reports to the GSBS on progress toward implementing the action plan formulated from the 7-year review. The action plan along with a summary of the self-study and external reviews will be submitted to the THECB Academic Affairs and Resource Division no later than 90 days after the conclusion of the review.

Complementing the formal review is a continuous, ongoing outcomes assessment. Outcomes assessment focuses primarily on student learning. It asks and answers the questions:

1. What do we want our students to know and be able to do when they graduate?
2. How well does our program/concentration promote that learning?

Its purpose is to monitor whether a program/concentration is achieving its goals so that where goals are not being met, changes and improvements can be made. This process begins when graduate faculty identify the major objectives of their program/concentration, the more specific outcomes derived from these objectives, and the data that must be collected and analyzed to determine whether those outcomes are being achieved. To the extent possible, the data are supplied by the GSBS and other university sources. However, some data- e.g., data aggregated about student performance on prelims, the final oral defense, etc. – must be collected within each academic area.

Once outcomes and relevant data sources have been identified, the next step is to develop an outcomes assessment plan. The plan should identify which outcomes will be assessed over the seven-year cycle between formal reviews. Annually, the graduate advisor or another faculty member designated by the department Chair reports to the GSBS, within Weave, as to which outcomes were assessed, what the findings were, and any resulting improvements. A summary of these reports, as well as the assessment plan, becomes part of the self-study for the next formal review.

Annual Report on Action Plans

Each program will be reviewed on a seven-year interval. Every year between formal reviews, each graduate advisor or designee of the programs, or concentrations, will be asked to provide a brief summary of progress made on the "action items" listed: What, if any, items are behind schedule, and what are the hindrances to their timely completion? What strategies have been developed to address these hindrances (e.g., modifying the action item, seeking other resources to fund the action item, etc.)? Is there anything the GSBS office or TTUHSC administration can do to help address any uncompleted action items? This information will be captured in the Weave Online system.

Periodic graduate academic reviews give the school important information about the strengths and weaknesses of academic areas such as: the quality and accomplishments of its graduate students, the future resource needs, and its contribution to the mission of the university. These reviews are designed to help faculty and administrators gain a clear understanding of the following:

1. The academic purpose within TTUHSC and GSBS.
2. Objectives and outcomes (faculty expectations) for the program/concentration. The effectiveness in achieving these purposes & outcomes.
3. The overall quality.
4. The faculty's vision, i.e., future aims and changes necessary to achieve those aims.

Schedule of GSBS Academic Reviews

Biotechnology	2014 - 2015
Pharmaceutical Sciences	2016 – 2017
Public Health	2018 – 2019
Biomedical Sciences	2019 - 2020

Sections included in this policy

Review Process Timeline

Jul **Notification of Review*:*** The GSBS Office will schedule a meeting with all Graduate Advisors and Department Chair(s) of the program to be reviewed to discuss the guidelines of the review process. If the Biomedical Sciences program is reviewed the Graduate Advisors and Department Chair(s) of the concentrations will be included.

Sept The Department Chairs will submit to the GSBS office the names of the Data Subcommittee faculty along with the names and contact information for possible external reviewers. The GSBS Office will be responsible for contacting the external reviewers and securing their cooperation.

Preparation of the Review Document: The self-study document should follow the format shown in the next section. The Department Chair(s) may designate a team of faculty members, considered the Data Subcommittee, to prepare the Graduate Academic Review Document. This subcommittee should have a Chair appointed by the Department Chair(s). However, the Department Chair(s) should be actively involved in overseeing its preparation and is responsible for the content, accuracy, and completeness of the report. All current graduate faculty members of the program/concentration being reviewed should be involved in the preparation of the report. The participation of enrolled students, alumni and professional staff is highly encouraged. The report should be evaluative rather than simply descriptive. It should incorporate not only an analysis of incoming students, time to degree, attrition rates, etc. but also a summary of the program and each concentration's continuous and ongoing outcomes assessment and the faculty's vision for the future. To ensure that the GSBS meets FERPA regulations, please ensure that all student information does not include private information such as SSNs.

Selection of GSBS Internal Review Committee Members: Departmental Chairs will select two graduate faculty members from each program/concentration to serve as representatives on the GSBS Internal Review Committee. In addition, the GSBS Office will select 2 student representatives.

Nov **Submission of Program/Concentration Review Document**: The review document should be forwarded to the Graduate School of Biomedical Sciences (5BC100) along with an electronic version on CD-ROM or Flash in Portable Document Format (PDF). The GSBS Office will review the document and may request that revisions be made if it is incomplete or simply descriptive. The report should address the appropriateness of

the academic goals, the quality of the students, and those elements influencing student success: mentoring, research, the faculty, the curriculum, professional development opportunities, facilities, and student funding. The report should also summarize the strengths and weaknesses of the program and concentrations and make recommendations for improvements. The GSBS office will send copies to the GSBS review committee and the external reviewers. The original document will remain in the GSBS Office (5BC100).

Nov **External Reviews:** Each program will be reviewed by at least 2 external reviewers (ERC) outside of Texas who will be provided the self-study for each concentration and will be brought to the campus for an on-site review in January. The external committee will consist of 5-6 reviewers for the Biomedical Sciences review and 2 external reviewers for Biotechnology, MPH, and Pharmaceutical Sciences.

Nov **The Review Process:** The GSBS Associate Dean will meet with the Internal Review Committee (IRC) members within the first two weeks of November. At this meeting instructions and advice on the review process, including an optional review template (Attachment B) will be given and the committee will be asked to select a Chair from its membership.

The Program Review Document will be mailed to External Reviewers no later than Nov 15.

January External Reviewers Site Visit. A site visit by External Reviewers should be scheduled sometime around the first week of GSBS classes, but no later than Jan 31. External review documents due to GSBS by February 15.

Feb **Internal and External Report Due:** Copies of the external review report are provided to the Internal Review Committee Chair.

Mar **External Review sent to IRC for comments.**

Documentation Distributed: Copies of the IRC report and the external reports will be provided to the Graduate Advisor(s), Department Chair(s) and Data Subcommittee Chair(s), with a request for a written response from the program/concentration faculty. The response (Action Plan) outlines the means and timetable by which the faculty plans to implement the recommendations of the GSBS review committee and specifies any additional resources needed to do so.

Apr **Action Plan sent to GSBS.**

May **Post-review Meeting:** The GSBS Associate Dean will schedule a meeting with the Graduate Advisor(s), the Department Chair(s), Data Subcommittee Chair(s) (if applicable), the Chair of the GSBS review committee, and the GSBS Dean, for mid-May. At this meeting, the graduate advisor(s) and Department Chair(s) summarize the faculty's response (Action Plan). For the Biomedical Sciences review, the GSBS Associate Dean will provide a summary of the recruitment efforts, admissions process, and the Integrated First Year Core Curriculum.

Jun **Executive Summary due**.

NOTE: During the review process for the Biomedical Sciences program, the GSBS office will include a summary of the recruitment efforts, admissions process and the Integrated First Year Core Curriculum. In addition, the GSBS office will merge all data provided by each concentration to summarize the Biomedical Sciences program. The final report will include aggregate data not concentration specific data.

Review Format

** All data should be collected for the prior seven academic years

PROGRAM/CONCENTRATION OVERVIEW

1.1 Title of Program/Concentration

1.2 Department Name

1.3 Brief History and Mission: Provide a brief history of the development of the graduate program/concentration. Briefly describe the mission.

1.4 Degree Objectives and Outcomes: List the objectives and outcomes (faculty expectations) for the program/concentration.

GRADUATE CURRICULA

2.1 Course offerings and their enrollment during the review period.

2.2 Describe any significant changes in curriculum and instruction since the last review. Explain the reason for the changes, such as different needs of students, shifts or emphasis in the discipline, changes in faculty, perceived weaknesses in the curricula, problems with facilities, etc.

2.3 List required courses: First-year curriculum, statistics, ethics, etc.

2.4 What specifically is done to facilitate critical thinking and problem solving to prepare graduates for a wide variety of positions in academics and other environments?

FACULTY

3.1 Alphabetical list, by rank (graduate faculty status level), of graduate faculty members in the program/concentration including a statement of how many new faculty members have been hired since last review.

3.2 Faculty Activity Report (see Attachment A) for each faculty that summarized the past 7 years of relevant activities including:

- 3.2.1 Education
- 3.2.2 Teaching – list all courses taught; number of hours lectured per year in graduate courses; student enrollment in course taught
- 3.2.3 Committee responsibilities
  - 3.2.3.1 Number of advisory committees that each member has served or chaired during the past 7 years, including the students name and when student graduated

3.2.3.2 Service to GSBS committees; graduate council, Chair of recruitment committee, core curriculum committee, etc.

3.2.4 Honors and Awards

3.2.5 Major Publications - Number of scholarly publications during the period of review (excluding abstracts)

3.2.6 Funded Projects / Grants - Active external and internal grants and contracts

3.2.7 Service – should include any program/concentration, university, professional and community service activities (grant review panels, editorial boards, leadership positions in professional societies)

3.3 *Advising*: Describe how and when faculty advisors are assigned to graduate students, as well as any guidance that new faculty are given in directing graduate student research.

3.4 *Faculty Quality*: Describe the ways in which the department evaluates the quality of its graduate faculty (e.g., teaching evaluations, peer review, publications, research grants, graduate students advised and their time to degree) and how it uses the results of these evaluations.

3.5 *Faculty Distribution*: Is the department staffed adequately to meet the needs of various fields of specialization in your discipline? If not, please provide a realistic plan for how an appropriate distribution of faculty could be achieved across specializations offered.

GRADUATE STUDENTS

4.1 Data Collection – admission criteria

4.1.1 Number of applications for last 7 years

4.1.2 Percent of applicants offered that actually matriculated

4.1.3 List of where students came from (previous schools)

4.2 Data Collection - student information:

4.2.1 Students graduated during the review period, graduate GPA's and attrition rates

4.2.2 Average time and credit hours per degree

4.2.3 Students during the review period that have received national and university recognition, including fellowships, scholarships, departmental and other awards (include name, type and amount of awards received

4.2.4 Number and percent of doctoral graduates employed in the field (or in a post-doctoral position) within one year of graduation and the average length of time to secure the job.

4.2.5 Present position and place of employment of students graduating from the academic area during the review period

4.2.6 Publications & presentations by student

4.2 Quality: Comment on how you evaluate and assess the quality and performance of your graduate students. Referring to the above data, comment on student quality and trends over the past 7 years. What specific measures does the department use to evaluate the quality of entering students? (For example, what use is made of the GPA or of standardized test scores such as the GRE?). Are your students as good as you would like them to be? If not, what are the contributing factors? What are the specific admissions criteria for masters and doctoral students? Provide summary of recruitment efforts.

4.3 Degrees Granted: Comment on the trends in the number of degrees awarded annually and the average length of time required to complete each degree. What is currently the approximate attrition rate? What has been the trend in attrition over the past 7 years? If attrition has been increasing, what measures, if any, have been taken to address that increase?

4.4 Need/Placement: Describe past, present and anticipated future need for graduates in the TTUHSC community, region and nation. Report any information you have on the level of employer satisfaction with your graduates and the students post graduate performance (if available). Describe the level and kinds of assistance you offer in the placement of your graduates. Assess the strength of student demand for your program/concentration over the last 7 years.

4.5 Funding: Describe the research assistantships and other support packages available for your students and the approximate annual number of assistantships awarded.

CURRENT RESEARCH

5.1 Current Research: Provide a brief description of significant ongoing research in your program/concentration, including the number of post-docs in the labs. Indicate the major strengths or emphases of this research. Describe three to five major research accomplishments over the past 7 years by faculty and/or graduate students and any new research emphases planned for the near future (through new faculty hires, redirection of current faculty's research, etc.)

5.2 External Research Support: Evaluate the level of external funding for research. Are graduate faculty competing effectively for external support? What were the levels of outside funding in research grants and other grants (a) at the time of the last review, and (b) the current year? Comment on any trends.

5.3 Research Development: What is being done to encourage and develop research collaborations with faculty performing similar research elsewhere in the university? Also, please describe deficiencies in facilities and resources that impede the attempts to reach research objectives and any plans to address these deficiencies.

CONCLUSION – (maximum two-page summary)

6.1 Summarize the major strengths and weaknesses of the graduate program/concentration and the challenges and opportunities it faces in the foreseeable future. Include summary information (highlights and challenges) captured in WEAVE online annual reports.

6.2 Briefly describe the vision/strategic plan for the immediate future: Project the major goals for the next 7 years.

APPENDICES – could include, but not be limited to, the following:

7.1 Strategic plan to improve/maintain the program/concentration
7.2 Specific graduate program/concentration guidelines
7.3 Weave online reports for 7 years

Task of the Internal and External Reviewers

Assessment: The task of the reviewers is to formulate objective judgments of the quality and effectiveness of the academic area. This evaluation is concerned mainly with the quality of graduate education received by students.

Sources: The GSBS review committee is encouraged to focus attention on questions regarding the relationship of program/concentrations to the goals of the university. It is the task of the reviewers to single out those features that merit special commendation, and to make recommendations where there is room for improvement. Reviewers should formulate their evaluations not only from the review document, but also from interviews with the graduate advisor, his/her departmental Chair, other graduate faculty members, and the students.

The Executive Summary Report: The findings and recommendations of the GSBS review committee should take the format of a concise one to two-page executive summary. Overall observations, reputation, strengths/commendations, weaknesses/recommendations, and value of the program/concentration to the mission of the university should be included in this report. **Specific and prioritized recommendations should be made regarding what is needed to strengthen areas that have weaknesses, or perhaps what is needed to further strengthen an excellent program/concentration.** The GSBS review committee should rate the program/concentration under review and provide an overall assessment similar to the following:

- Excellent
- Satisfactory
- Needs improvement

Guidelines for Internal & External Reviewers

During the review of a graduate academic area, reviewers are encouraged to evaluate with respect to the areas shown below. Reviewers should approach this evaluation with the same seriousness and thoroughness as if they were performing peer review of a manuscript or extramural grant application. Reviewers are encouraged to give a numeric rating for each area and the optional review template may be useful in this area. Reviewers should not feel confined to the areas specified and can examine and comment on other areas that they deem important to the review process. The primary goal of the review is to provide the university, graduate school, and graduate program/concentration under review with a meaningful and critical assessment of the academic area.

Overview and Vision
Reviewers should examine the mission and vision of the graduate program/concentration, paying special attention to academic planning, organization, size, and success at achieving the stated mission.

Faculty Productivity
Factors that should be considered include: faculty resources, particularly external research funding; faculty publication records, scholarship, and awards; faculty external recognition.

Quality and Quantity of Graduate Students and Graduates
Factors that should be considered include: student recruitment, student retention, applicant pool, placement of graduates, career success of former students, and student productivity.

Curriculum
Factors that should be considered are: degree requirements, course offerings and frequency, areas of specialization, nature and type of qualifying exams.

Recommendations & Suggestions
Provide recommendations and suggestions for improvement.

External Review Reports
External Reviewers may use whatever format they prefer to submit their review to the Graduate School of Biomedical Sciences. If you do not have a preferred method, we will provide you with a template that may be utilized.

ATTACHMENT A

Suggested Faculty Activity Report Template

General Guidelines/Instructions

Each Faculty Member Report Document submission:

- Should be limited to no more than a total of five pages
- Should provide a concise, balanced, and brief document that summarized the past 7 years of relevant activities

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Name
Faculty Activity Report
Last 7 Academic Years
(e.g., September 2004 to August 2011)

Education

- List degrees earned, major, and each year degree was attained.

Teaching (last 7 years only)

- List all GSBS courses taught during the review period.
- Provide semester and year that course was taught.
  Example:

2010-2011 Fall/Spring		Enrollment
GPHY 230	Introduction to Statistics	_____
GPHY 290	Research Methods	_____
GPHY 320	Learning and Motivation	_____

Please provide any Chair and committee responsibilities, along with all individual instruction/mentoring activities that you provide in this section.

- On doctoral dissertations, please specific student name, degree, dissertation title, and date of completion
- On master's thesis, please specify number chaired and number of memberships.

Honors and Awards (last 7 years only)

- List awards and honors received along with the year that it was bestowed.

Major Publications/Scholarly Work (last 7 years only)

Funded Projects/Grants (last 7 years only)

Service (last 7 years only)

- List service activities and years provided.
  Should include any unit, college, university, professional, and community service activities

ATTACHMENT B

Please Note: Full faculty CVs should also be made available to the external reviewers.

Graduate Academic Review Assessment Form

INSTRUCTIONS TO REVIEW PANEL MEMBERS

The Texas Higher Education Coordinating Board (THECB) has nine criteria for evaluation. This review will be submitted to the program director, Dean of the Graduate School of Biomedical Sciences and be part of the review document submitted to THECB.

Reviewers will provide a numeric assessment using a 5 point scale: 1 excellent, 2 good, 3 average, 4 mediocre and 5 poor.

Executive Summary

Summary : *Write a summary of the overall program review. The summary score is not necessarily an average of the component scores but your assessment the program in preparing future biomedical scientists* **Summary Score***:*

The review has been divided into four sections: mission and vision, students, faculty and curriculum. *Reviewers are requested to make comments, including both strengths and weaknesses, on expectations, achievements, etc. as appropriate.*

1.Mission and vision: **Score**:
Academic planning • **Administration and Organization** • **Success at achieving state mission** **Comments** •

2. **Students: Quality and number of students in program** **Score:**
Admissions criteria • **Recruitment and applicant pool** • **Student diversity (applicant pool, matriculated, graduated)** •

Financial support, amount and sources

-

Student enrollment

-

Graduation rate and number of degrees per year

-

Placement of students and career success

-

Student productivity

-

Student organized activities, e.g. Student Research Week

-

External student awards

-

3. **Faculty**

Score:

Number of core faculty

-

Faculty diversity (core)

-

Core faculty publications

-

Core faculty external grants

-

Core faculty awards, recognition, and external professional service

-

4. **Curriculum**

Score

Degree requirements

-

Comments

-

5. **Program curriculum and duration in comparison to peer programs**
Score
Comments •

6. **Program facilities and equipment**
Score
Comments •

7. **Program finance and resources**
Score
Comments •

8. **Program administration**
Score
Comments •

9. **Faculty qualifications**
Score
Comments •

Any other comments pertinent to program assessment not covered above
Comments •

Graduate Awards

Purpose: To outline the qualifications and selections process for the GSBS Graduate Awards: Outstanding Graduate Student and the Dean's Recognition Award.

Requirements to qualify:

The graduating student must be nominated by his or her respective program /concentration.

The student will be selected by accomplishments in the following areas:

- Educational merit (e.g. GPA, coursework, course load, etc.)
- Contributions made to TTUHSC and its students
- Contributions made to GSBS
- Contributions made to the student's laboratory
- Contributions made to the scientific discipline evidence by peer reviewed publications and meeting presentations
- Receipt of research funding and/or scholarships
- Community service
- Other awards received
- Attends GSBS Convocation and HSC Commencement
- Each applicant will be asked to submit a complete C.V./resume; two letters of recommendation; and a brief narrative describing the accomplishments they have made during their graduate career.

Selection Committee:

From nominations submitted by GSBS students, the Dean will appoint a selection committee composed of seven members: five faculty and two students. The selection committee will choose two award recipients based on the criteria listed above. Dr. Michael Blanton serves as a non-voting member representing the GSBS.

Monetary Award:

Award recipients may receive a plaque, a medallion, and /or a monetary or travel award. The amount of a monetary award will be determined by the GSBS office.

Outstanding GSBS Student – selected from doctoral nominations

- Required to attend the GSBS Convocation and the HSC Commencement
- Serves as GSBS Convocation speaker
- Must provide text of speech for GSBS approval of content
- Carries the GSBS seal at the HSC Commencement

Dean's Recognition Award – selected from master of science nominations

- Required to attend the GSBS Convocation and the HSC Commencement
- Reads the description of the GSBS seal at Convocation
- Carries the GSBS banner at the HSC Commencement

Leave for Student Employees

Purpose: To define Texas Statutes for vacation and sick leave for students and outline the policy established for GSBS students for time off.

1. Student employment is governed by the Government Code, Chapter 661 of the Texas Statutes. Excerpts from the Code are provided to assist the GSBS Faculty and Students. The complete document may be viewed at: http://www.capitol.state.tx.us/statutes/statutes.html

SUBCHAPTER F. GENERAL PROVISIONS FOR VACATION LEAVE FOR STATE EMPLOYEES

661.152. Entitlement to Annual Vacation Leave
(a) A state employee is entitled to a vacation in each fiscal year without a deduction in salary, **except for a state employee who is:**
(1) an employee of an institution of higher education as defined by Section 61.003, Education Code, who:
(A) is not employed to work at least 20 hours per week for a period of at least four and one-half months; or
(B) **is employed in a position for which the employee is required to be a student as a condition of the employment;** Added by Acts 1999, 76th Leg., ch. 279, § 19, eff. Sept. 1, 1999.

SUBCHAPTER G. GENERAL PROVISIONS FOR SICK LEAVE FOR STATE EMPLOYEES

661.201. Applicability
(b) An employee of an institution of higher education as defined by Section 61.003, Education Code, is eligible to accrue or take paid sick leave under this subchapter **only if the employee**:
(1) is employed to work at least 20 hours per week for a period of at least four and one-half months; and
(2) **is not employed in a position for which the employee is required to be a student as a condition of the employment.** Added by Acts 1999, 76th Leg., ch. 279, § 19, eff. Sept. 1, 1999.

2. **Additional GSBS information**:

a. Students must be registered every semester or be on an approved official leave of absence (medical or personal).
b. Mentors have at their discretion the ability to grant up to 10 work days of personal leave utilizing a flexible schedule for each student employee per academic year. Work days are as defined by the GSBS calendar and exclude holidays. Personal leave may not be accumulated and shall not be carried forward to the next year.
c. If a student employee desires leave exceeding the 10 days as described above, such approval must be granted by the advisor/mentor and Assistant Dean prior to such time as the leave has been taken. If extended leave is approved, a supplemental form will be submitted to Human Research for Leave without Pay.
d. If extended leave is taken without prior approval of the advisor/mentor and Assistant Dean, the student employee is subject to disciplinary actions including but not limited to, termination.
e. No personal leave shall be granted during the Fall or Spring semesters; exceptions to this policy must have GSBS approval.

f. Leave periods for either students or employees will not extend the maximum time requirement to complete a degree.
g. The enforcement of this policy will be the responsibility of the mentor to document personal leave days for each of their students.

Requests for personal leave exceeding 10 days per academic year must have GSBS approval prior to the leave date. The personal leave form should be used to request such approval. Records of personal leave less than 10 days should be maintained by the concentration or program. It is highly recommended that the concentrations/programs use the personal leave form to track student's accumulated absence from the lab.

MD/MS Guidelines

Texas Tech University Health Sciences Center Graduate School of Biomedical Sciences and the School of Medicine offer a combined MD/MS degree program for eligible medical students. TTUHSC medical students in good academic standing that are interested in the MD/MS program should contact the GSBS Office for further information. To formally apply to the MD/MS program, the applicant should submit a written request to the GSBS Dean (cc research mentor and graduate.school@ttuhsc.edu) and within the letter specify the faculty member (must have graduate faculty status) that has agreed to serve as a mentor for MS research. The GSBS will coordinate with SOM in reviewing this request.

BASIC PROGRAM: Upon completion of Year 2 of medical school (MS II), including USMLE Step I Exam, (or completion of Year 3, MS III), TTUHSC medical students may enter a one year MS program in Biomedical Sciences. During this year (July/August – June), MD/MS students will be engaged full time in biomedical research within any TTUHSC faculty member's laboratory that has GSBS graduate faculty status, culminating in a M.S. thesis (thesis track) or final report (non-thesis track).

A) Thesis Option:

GSBS requires a minimum of 24 hours of graduate work (which may include up to 6 hours of research) plus 6 additional hours of thesis.

Intent to Graduate – A student planning to graduate must file in the GSBS office the Statement of Intent to Graduate at the beginning of the semester of intended graduation. Students should check the GSBS website at: http://www.ttuhsc.edu/gsbs/current/ for the graduation deadline dates.

Final Oral Report - Once the committee agrees that the research is complete, plans for the writing and defending a student's thesis should be made. A draft of the thesis and an abstract must be submitted to the Advisory Committee at least two weeks prior to the final oral examination.

Thesis Defense – Students defend their thesis in a final public seminar followed by a private oral examination by their Advisory Committee. The written thesis must be submitted to the Advisory Committee two weeks prior to the Defense date. Evaluation of the defense and determination of its outcome is documented by the Advisory Committee and reviewed with the

student. The results of the defense are recorded on the Thesis Oral Defense form and the Thesis Signature form.

Thesis Bound Copies – Students are required to purchase one bound copy through a bindery (GSBS recommends using thesisondemand.com). Student advisory committee members may also request that the student provide them with a bound copy. The program requires only submission of a PDF copy of the final version to the graduate program coordinator.

B) Non-Thesis Option:

GSBS requires a minimum of 36 hours of graduate course work.

Intent to Graduate – A student planning to graduate must file in the GSBS office the Statement of Intent to Graduate at the beginning of the semester of intended graduation. Students should check the GSBS website for graduation deadlines at: http://www.ttuhsc.edu/gsbs/current/.

Final Written and Oral Report: While students that select the Non-Thesis Option are not required to write and orally defend a MS thesis, the program does require submission of a final written report that should take the form of a peer-reviewable manuscript from a scientific journal of your choosing and which contains the applicant's research and a oral defense of this manuscript.

REQUIREMENTS: MD/MS students are allowed to transfer 30 credit units from MS I and MS II coursework. In addition, they must also complete:

- the GSBS Responsible Conduct of Research course,
- at least one elective didactic course (e.g. Biomedical Statistics; Bioinformatics, etc.),
- at least 6 hours of research and
- 6 hours of MS thesis coursework (for thesis track).

Additional details of the requirements for the M.S. in Biomedical Sciences are provided in the GSBS Catalog located on-line at: http://www.ttuhsc.edu/gsbs/catalogs.aspx

ASSISTANTSHIPS: MD/MS students will be provided with an annual salary of $25,000 (each 1/3 amount will be provided by GSBS, SOM, and faculty mentor respectively). From this salary amount the student is responsible for costs of tuition, student health insurance requirement, books, etc.

MD/PhD Guidelines

Texas Tech University Health Sciences Center Graduate School of Biomedical Sciences and the School of Medicine offer a combined MD/PhD degree program for eligible students interested in training preparatory to a career in Biomedical Research/Academic Medicine.

The following policies and guidelines have been established for this program:

APPLICATION, INTERVIEW & SELECTION PROCESS: Students will apply through the American Medical College Application Service (AMCAS) at http://www.aamc.org/students/amcas/start.htm. A secondary SOM application is also required and information can be found at https://www.ttuhsc.edu/som/admissions/secondaryapp/default.aspx
The secondary application fee is $50.00.

Once a student has applied to AMCAS, the selection committees from both schools invite selected applicants for interviews. The MD/PhD interviews are coordinated through the School of Medicine's Admissions Office. The interview is tailored to match the interests of the applicant and will possibly include one or more graduate faculty members, the GSBS Associate Dean, and one current MD/PhD student. Additional details of the review process are described in Attachments A-B.

MD/PhD students enter the GSBS as Undeclared and following research lab rotation select a mentor and a graduate concentration within the Biomedical Sciences Graduate Program.
Concentrations available within the MD/PhD program include: Biochemistry & Molecular Genetics, Cell & Molecular Biology, Cell Physiology & Molecular Biophysics, Immunology & Infectious Diseases, Pharmacology & Neuroscience.

The GSBS faculty that conduct interviews with prospective MD/PhD applicants will return an evaluation form to the GSBS. The forms will be used by the GSBS Dean and/or Associate Dean and the MD/PhD selection committee to begin ranking the prospective applicants by the end of October. The selection criteria will be based on three general categories: academic record, acceptable test scores, and the individual profile which includes, but is not limited to, recommendations, research background, motivation, and interviews. The GSBS Associate Dean and the SOM Associate Dean for Admissions (or a designated representative) will meet in early November to determine the rankings and make initial offers. The number of offers will vary depending on the availability of research assistantships.

ASSISTANTSHIP: Students will be recruited nationwide for the MD/PhD program. In keeping with state regulations, the School of Medicine allows up to 10% of students to be out-of-state residents. Students accepted into this program will receive a Research Assistantship as long as the student maintains the high standards set forth by the retention criteria of the program. A student may receive an assistantship for up to a maximum of 8 years, however it is expected that at the end of seven years, the student will have completed all the requirements of both the MD and PhD programs. Students receiving a Research Assistantship are considered employees at Texas Tech University Health Sciences Center (50% FTE) and qualify for in-state tuition, certain fee waivers and health insurance benefits. Research Assistantship positions do not accrue sick leave or vacation. Payment of the assistantship will come from the SOM for the first 2 years. The GSBS will fund the assistantship while the student completes the PhD portion of the degree. The GSBS funding policy states that GSBS will pay 100% of the assistantship for the first two years. Beginning in the third year of the doctoral program, funding is split 50/50 between the GSBS and the PI. Payment of the assistantship will transfer back to SOM as the student begins the last two years of Medical School.

TUITION: Tuition scholarships are paid through the School of Medicine during MD enrollment. During the PhD enrollment, tuition scholarships are paid by the Graduate School of Biomedical Sciences. All fees are paid by the student. When new students are admitted, a memo will be forwarded to the Bursar's office authorizing tuition scholarships. The Texas Education Code (Sec. 54.065) also allows for in-state tuition for non-residents and citizens of countries other than the United States of America. For additional information please reference the bursar's website: www.fiscal.ttuhsc.edu/busserv/bursar

ENROLLMENT OPTIONS: The MD/PhD curriculum is flexible to accommodate the academic needs of the students, most commonly the need for increased research time. Students commonly enter the

program after receiving their bachelor's degree. However, students may enter after one or two years in medical school or in pre-doctoral education and training. In these latter cases, adjustments are made in the curricular plan to optimize the approach for the student. Typically, the pattern for enrollment is as follows **(Option 1)**:

	Summer	Fall	Spring
Year 1	GSBS	SOM	SOM
Year 2	GSBS	SOM	SOM
Year 3	GSBS	GSBS	GSBS

Students typically arrive in the summer after graduation from college and begin a laboratory rotation in a field close to their prior research or in a field they are seriously considering for their doctoral dissertation. This rotation allows them to adjust to the campus and begin learning about the variety of possibilities for future research. In early August, MD/PhD students matriculate in the medical school and begin their course work. During the summer following the first year of medical school, the student has approximately two months for another laboratory rotation. Commonly after taking the USMLE Part I examination at the end of the second medical school year, the student returns to the laboratory to begin the full-time research project. **(Option 2) However, students have the option to complete a 3rd year of medical school prior to returning to the GSBS.** Students returning to the GSBS after their second or third year of medical school will then arrange with their chosen advisor an appropriate time to begin their thesis research, which will begin no more than two weeks after the student has taken USMLE Step 1. Any student who fails to obtain a passing score in their first attempt of the USMLE Step 1 will be dismissed from the MD/PhD program and will fall under guidelines for Step 1 failure published in the TTUHSC SOM Student Handbook. Students who successfully complete the 2nd year of medical school will have completed 30 hours of credit that will be applied to the GSBS transcript and will have the 1st year graduate curriculum waived. The PhD requirements of the GSBS and the concentration in which the student has selected will apply.

In consultation with the student and the basic science academic director/advisor, a clinical co-advisor will also be identified, preferably in the first year. The GSBS Associate Dean will serve as the facilitator of this process. This clinical advisor will be a part of the student committee, however, s/he will only have voting rights if they also hold a graduate faculty appointment.

Students are encouraged to arrange shadowing experiences with their clinical mentor throughout their research project to maintain the clinical skills they obtained in the Early Clinical Experience blocks. The clinical clerkships will be completed on the campus where the doctoral research project was conducted.

In the third year of the student's doctoral program, students will work intensively on their research project. Most of the students at the end of the 3rd year or early in the 4th year have completed coursework. The course requirements are determined by the individual concentrations and may vary depending on the area of research. Generally by the time the coursework is completed, the student is well established in research with his or her thesis mentor. The length of time that is required to complete the research, write a dissertation and defend can vary. No influence is exerted by the concentration to attempt to shorten this phase of training. When the students are engaged in their research, they are subject to the same rules and expectations as any other doctoral students within that concentration. In addition to the preparatory work accomplished in the first two years while in medical school, students commonly spend three and a half to four years in graduate training. Students may not start clinical rotations until the dissertation has been successfully defended.

CRITERIA FOR ADMISSION: Acceptable MCAT, GRE, and GPA scores are required. Previous research experience and motivation will be key features in the evaluation. The GRE is encouraged of all students applying to the MD/PhD program. In some cases the GRE requirement may be waived by the academic department based on the MCAT score.

RETENTION CRITERIA: Students in the MD/PhD program must maintain:

- SOM grades of Honors or High Pass in at least 2 of 4 didactic blocks from each of the first two years of the curriculum and at least a Pass in the other two blocks. Students in the MD/PhD program must also obtain at least a grade of Pass in the Early Clinical Experience I and II blocks and any other curricular requirements.
- GSBS grades of B or better in each course
- GSBS Cumulative GPA of 3.5 or better

Any student who fails to maintain the standards described above during Year 1 of the medical school curriculum will meet with the MD/PhD evaluation subcommittee. The MD/PhD subcommittee will determine the appropriate course of action, which may result in the student being placed on academic probation. A student who is on probation after Year 1 and who fails to maintain these standards in Year 2 of the medical school curriculum will be dismissed from the MD/PhD program. The requirements to maintain a funded status in the MD/PhD program are at a higher level than those for retention in either the School of Medicine or the Graduate School of Biomedical Sciences. The student may withdraw from one or the other of the two Schools and continue in the School of their choice if they continue to meet its standards of performance and conduct. Any student who withdraws from the PhD component of the program must apply for early reinstatement to medical school through the Associate Dean for Academic Affairs. An Exit Interview with a representative from the Operating Committee is required of all students withdrawing from the program.

THE MD/PHD PHYSICIAN SCIENTIST COMMITTEE consists of the Dean of the GSBS, the GSBS Associate Dean, the Dean of the School of Medicine, and the SOM Associate Dean for Admissions (or a designee named by the SOM Dean). In addition, the following members will be appointed in January by the GSBS Dean to serve 3 year terms. These appointments will be staggered to provide for continuity of the committees work:

- representatives from the faculty of the clinical departments of the School of Medicine (2),
- graduate faculty representatives from the GSBS doctoral concentrations (2) and
- Two MD/PhD students.

Co-Chairs (SOM and GSBS) will provide oversight of this committee as appointed by their respective Dean's. The faculty members will be selected because of their experience with the MD/PhD program and their expertise in certain scientific areas. Student participation serves to bring the perspective of the students to the deliberations of this body and, in turn, is helpful in the career training of the students. The student will be a full voting member. The SOM Director of Admissions and the GSBS Assistant Dean will staff the committee and will not be voting members.

The Physician Scientist Committee has a number of critical responsibilities:

1. the members serve as liaisons to academic departments or interdisciplinary programs;
2. it reviews and advises on guidelines and general management decisions;
3. the members are available as advisors to the students;

4. in regard to individuals and any problem which may arise, the members may serve in an advisory function or sometimes as active intermediaries; and
5. a representative from the committee will conduct exit interviews for students withdrawing from the program.

STUDENT EVALUATION SUBCOMMITTEE: The MD/PhD student along with the student's major advisor, the concentration Graduate Advisor, SOM Associate Dean for Academic Affairs, and the SOM Assistant Dean for Student Affairs will attend annual reviews conducted by the GSBS Associate Dean in June of every year. The evaluation is signed by the student, the GSBS Associate Dean, and the SOM Associate Dean, and is maintained in the student's GSBS and SOM files. A copy of the signed evaluation is also provided to the student. A standardized form (Attachment C) is used to reflect grades for the term, an account of the student's motivation, initiative, participation, and overall level of scholarship and research aptitude. The committee also advises on the future program components and timelines. Notification of probationary or dismissal status is also made in writing. Should a student perform unsatisfactorily in a term in which he/she is on probation, the student is subject to dismissal from the MD/PhD program. Dismissal from the combined degree program, or voluntary withdrawal, shall result in discontinuance of the student's research assistantship.

The Student Evaluation Subcommittee will also be responsible for reviewing student grades after each semester or block, especially for students on academic probation. The Associate Dean will report to the Physician Scientist Committee in June of every year on the progress of the students.

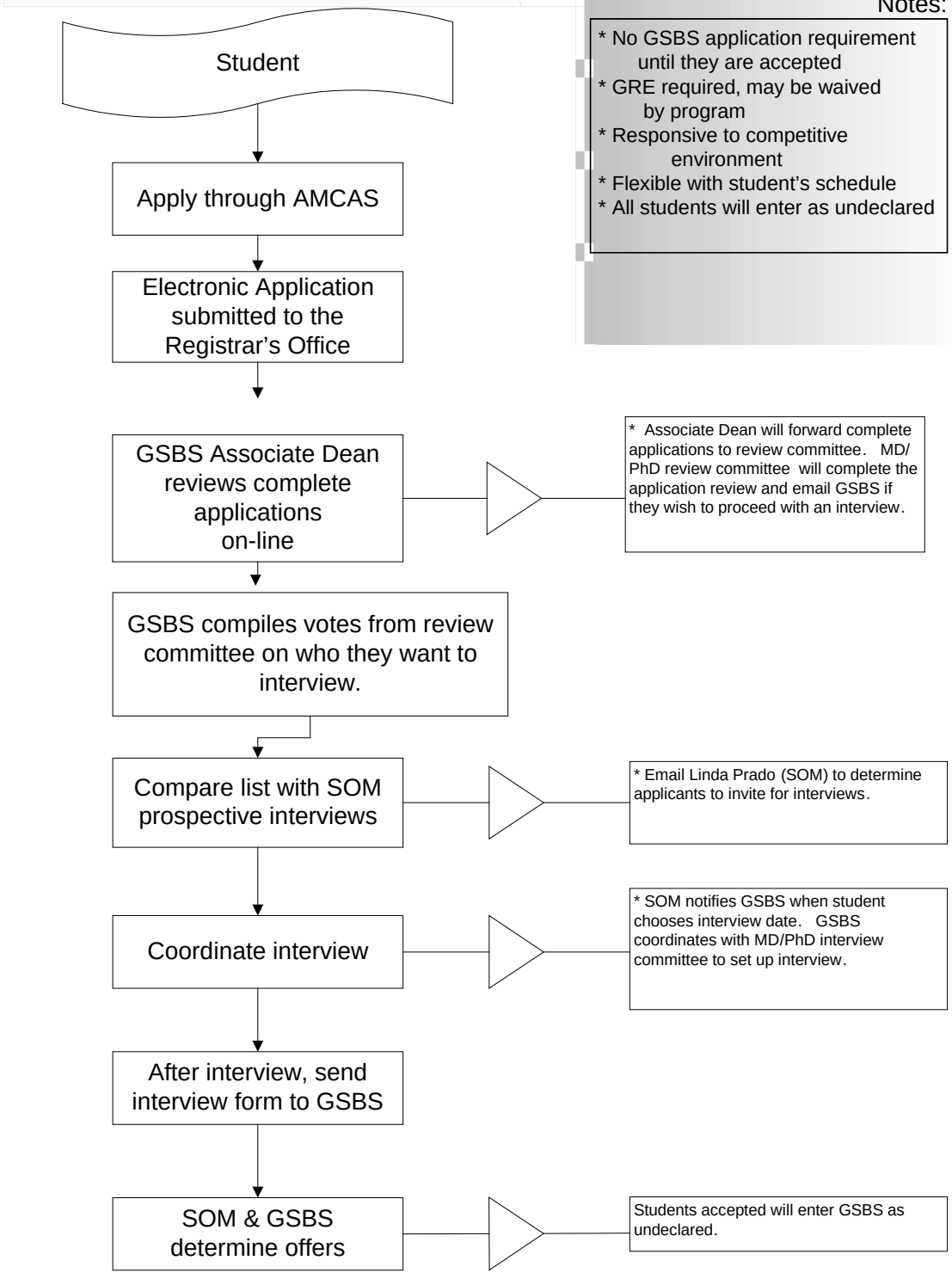
DIPLOMA: Upon completion of the PhD requirements, MD/PhD students will receive their PhD diploma at the next designated graduation date (May, August, or December). Students are encouraged to attend the GSBS convocation ceremony the following May and have the option of attending commencement with the GSBS. They will attend the SOM convocation and commencement upon completion of the medical degree, at which time they will receive special recognition.

The School of Medicine and the Graduate School of Biomedical Sciences reserve the right to make changes in the MD/PhD program. Changes in policies and procedures will not be altered retrospectively and thus matriculated students will complete the MD/PhD program according to requirements in effect at the time of admission.

Revised and amended: July 2000, May 2008, April 2010, October 2011

Attachment A

MD/PhD Process



MD/PhD Interview Form

Applicant's Name:	
Interview Date:	
Interviewer(s):	

Research Achievements
Previous Research Experience:

Personal Communication, Intellectualism, and Appearance
Ability to speak constructively and with clarity:

Additional Comments

Admission Priority	
High	☐
Medium	☐
Low	☐
Not Eligible for Admission	☐

TEXAS TECH UNIVERSITY
HEALTH SCIENCES CENTER™

ATTACHMENT C

MD/PhD Annual Review

Students Name:

Program: **Qualifying Exam:**

Matriculation: **Admission to Candidacy:**

Date of Evaluation: **R Number:**

Present at Evaluation:

Grades

Date	Course Number	Course Name	Grade	Credit
	MSCI 5060	Clinical Oriented Anatomy	XX	9

COMMENTS (INCLUDE STUDENT'S MOTIVATION, INITIATIVE, PARTICIPATION, OVERALL LEVEL OF SCHOLARSHIP AND RESEARCH APTITUDE):

Student's progress is satisfactory ____Yes ____No (If no, suggested remedy:)

Student Signature _____ **Date** _____

GSBS Associate Dean _____ **Date:** _____

SOM Representative _____ **Date:** _____

xc: Student
Department
Major Advisor
Associate Dean for Educational Programs - SOM
Dean, Graduate School of Biomedical Sciences

Programs (New, Terminating & Changing Delivery Format)

Purpose: To outline the procedure for initiating and developing new degree programs, for changing delivery format for degree programs, and for terminating existing degree programs. The process listed in this policy should be followed prior to conforming to HSC OP 60.11.

1. **Proposing New Programs**

   a. Although a proposal for a new graduate degree program typically originates at the departmental level, development of the proposal should be preceded by conferences with the GSBS Dean and TTUHSC President, who will encourage or discourage continued development of the proposal on the basis of university priorities.

   b. Once a department receives encouragement or approval to develop a new degree program, it will prepare the Texas Higher Education Coordinating Board (THECB) new program proposal in accordance with the guidelines of the THECB, which is available from the THECB Web site. If the proposal includes delivery of all or part of the program through distance learning, the Southern Association of Colleges and Schools (SACS) *Substantive Change Procedures,* available on the SACS Web site, will be consulted and followed. Highest priorities for consideration of new programs shall be given to:

      1. Adequacy of faculty and facilities to undertake the program;

      2. Cost and relative impact on existing programs;

      3. Need for the program and benefits that will accrue to Texas from approval and implementation of the proposed program;

      4. Numbers and kinds of students who likely will enter the program;

      5. Market relevance for the academic degree, availability of existing or similar program in the state and region;

      6. Long-term market and educational sustainability;

      7. Degree of fit with TTUHSC mission; and

      8. Allocation of resources within the state and university in consideration of priorities.

   d. The proposal first should have the review and approval of the department and then be forwarded to the GSBS Office. The GSBS Office will send the proposal to the Graduate Council for review and approval at the next monthly graduate council meeting.

   e. A proposal for a new graduate degree program is reviewed by members of the Graduate Council. The graduate council may recommend approval, or it may send the proposal back for revisions and/or clarification before making a recommendation to the GSBS Dean. Proposals approved at the Graduate Council level are forwarded to the GSBS Dean for review and approval.

   f. If approved by the GSBS Dean, the proposal will be forwarded through the President to the Board of Regents for final review at the university level. At any one of the review stages, a proposal may be rejected or sent back to the originating department for revision and/or additional information.

   g. If the proposal is approved through all university levels, it will be transmitted by the Office of the President to the THECB for final review. The staff of the THECB requests a minimum of three months for review prior to Board action although, frequently, a longer timeline is needed.

   h. Prior to offering any distance education or off-campus courses or programs for the first time, GSBS must submit an Institutional Plan for Distance Education and Off-Campus Instruction to

the THECB for approval (*THECB Rules and Regulations, Chapter 4, Subchapter E, "Approval of Distance Education and Off-Campus Instruction for Public Colleges and Universities."*

2. Reviewing Courses for New Programs

a. Any new courses proposed as part of new program proposals will be reviewed as all other new courses are reviewed: with the understanding that final approval is dependent upon THECB acceptance of the new program.

b. Proposed new courses must be submitted using the Course Approval Form and forwarded with the program proposal so that both courses and the overall program description may be treated as a package.

c. The GSBS Office will hold the course applications until the Board of Regents and the THECB approve the program. The office will then complete the paperwork and send to the Registrar's Office where the courses will be entered on the THECB inventory.

d. New courses proposed as a part of a new degree program will not be included in catalog copy until the program is approved by the THECB. New courses must be approved by Graduate Council prior to December 31st in order to be added to the course catalog and to be available for the upcoming scholastic year.

3. Changing Method of Delivery of Existing Programs

a. Changes in method of delivery of existing programs that result in 50 percent or more of the program being offered via electronic telecommunications require prior approval by the Board of Regents and subsequent notification to the THECB. These changes also require prior SACS notification and approval and the submission of a substantive change prospectus. The Substantive Change Procedures, which may be obtained from the SACS Web site, should be submitted along with the request to change the method of delivery of the existing degree program. The Office of the President will notify SACS six months prior to the anticipated implementation of the modified degree program.

b. The following routing is required to approve changes in method of delivery: Department, GSBS Office, Graduate Council, Sr. VP of Academic Affairs, President and Board of Regents.

4. Termination or Merger of Existing Programs

a. A program may be terminated, or two or more programs may be merged, for various reasons, but such action will be preceded by full study and consultation by the parties concerned. Persistent under-enrollment, loss of critical faculty, a shift in priorities, or financial exigency are some of the issues that might lead to termination/merging of programs.

b. Before any program is terminated or merged, the rationale for such action will be presented and considered by the program involved and its department Chair and GSBS Dean. When the necessity for action has been established, the Graduate Council will review the proposed change for graduate programs. After such review, the GSBS Dean will render the final decision in consultation with the President.

c. The Texas Higher Education Coordinating Board will be notified by the Office of the President of any program terminations or mergers.

For more institutional information reference HSC OP 60.11 (New Degree Programs, Change in Delivery Format, and Degree Program Termination).

Recruitment & Retention

Purpose: To describe recruitment and retention strategies for GSBS

RECRUITMENT STRATEGIES

GSBS Website: This is an effective tool for exposing prospective students to the programs available in the Graduate School of Biomedical Sciences. The GSBS website has links to webpages for each program/ concentration.

Online Applications: Students are also able to apply to the Graduate School electronically via the website.

Research Assistantships: Many GSBS students receive a Research Assistantship which helps them financially and classifies them as employees of TTUHSC. This classification qualifies them for in-state tuition and health insurance benefits.

Competitive Scholarship: Exempts a student from payment of nonresident tuition over and above resident tuition. Student must be awarded a competitive scholarship of at least $1,000 for the academic year or summer of their enrollment and be either a nonresident or citizen of a country other than the United States. Student must compete with other students including Texas residents and the award must be made through a duly recognized scholarship committee. Certification is sent to from the GSBS office to the Financial Aid Office.

Regional and National Recruiting: GSBS attends various school career fairs and national science conferences to attract a wide range of students.

Local Recruiting Events: GSBS offers many on-site events that draw students regionally and nationally.

Student Research Week. An interdisciplinary forum designed to:

- stimulate exchange of research information among students
- highlight exceptional research performed by students in training
- expose students to the latest research advancements through seminars presented by distinguished biomedical scientists
- recruit regional students into our graduate degree program
- award scholarships in various categories of the poster presentations

School of Pharmacy Research Days. A forum for faculty, graduate students, research interns, postdocs, technicians, and residents to interact and exchange ideas for possible collaborations. It is a mixture of oral presentations from leading scientists that are invited, and poster presentations from faculty, students, postdocs, and residents. This meeting provides an opportunity for graduate students to showcase their research work and provides opportunity for faculty/student interaction.

Summer Accelerated Biomedical Research (SABR) Internships. Available to students interested in pursuing a career in basic biomedical research. The SABR Internships are intensive, 10 week opportunities for students to perform basic biomedical research while receiving a stipend. This summer program is offered in Lubbock and El Paso, Texas.

Amarillo Biomedical Research Internships (ABRI). Available to students interested in pursuing a career in biomedical research. ABRI is a 10 week program of intense research organized by the Texas Tech University Health Sciences Center School of Pharmacy in conjunction with the Pharmaceutical Sciences Program through the graduate school. Each student receives a stipend during the internship

Annual Tour and Dinner. Every year GSBS invites top TTU students to an evening of lab tours and dinner with some of our faculty. Students are targeted from undergraduate areas of study that naturally lend to getting a graduate degree in Biomedical Sciences.

Endowments and Scholarships:

- Achievement Rewards for College Scientists (ARCS)
- AT&T Chancellor's Graduate Fellowships established in 1997.
- Dean's Scholar Award – established in 2006
- GSBS Endowed Scholarship established in 2000
- Mary Lou Clements Scholarship established in 2000

Recruitment Budget: A small fund is allocated for the recruitment of students. Expenses include:

- Travel for faculty and staff to attend recruitment fairs
- Site visits for prospective students for special events
- Scholarships for students who place in the poster presentation during the TTUHSC Student Research Week
- Recruitment displays, brochures and giveaways
- Miscellaneous SABR Expenses

Research Assistantships

Purpose: To outline the Texas Education Code and to list benefits provided to research assistantship positions.

Texas Education Code Statute: Section 54.063. A teaching assistant or research assistant of any institution of higher education, and the spouse and children of such a teaching assistant or research assistant, are entitled to register in a state institution of higher education by paying the tuition fees and other fees or charges required for Texas residents under Section 54.063 of this code, without regard to the length of time the assistant has resided in Texas if the assistant is employed at least one-half time in a teaching or research assistant position which is related to the assistant's degree program under rules and regulations established by the employer institution.

Students employed as teaching or research assistants employed at least half time by any public institution of higher education in a degree program-related position may pay the same tuition while attending any public institution of higher education as a resident of Texas for themselves, their spouses, and their dependent children, regardless of the length of residence in the state. The institution which employees the students shall determine whether or not the students' jobs relate to their degree programs. If the spouse or children attend an institution other than the one employing the research or teaching assistant, they must provide proof of his or her current employment to the college they attend. It is the intent of this rule that employment be for the duration of the period of enrollment for which a waiver is awarded.

Enrollment. Students on research assistantships must be full-time students. The minimum enrollment for full-time graduate status is 9 hours in the regular semester and at least 6 hours in the summer term. Students on assistantships must matriculate every semester or the assistantship will be temporarily suspended until the next semester of matriculation. All doctoral students upon acceptance into GSBS will be employed as a research assistant funded either by the GSBS or the department. Any exceptions to this policy must be approved by the Dean. The research assistantship will be funded by the GSBS for 2 years followed by a 50/50 split between the GSBS and the department/PI for the remaining 3 years. Any funding past the 5th year for a doctoral student, will be the responsibility of the department/PI. For continuation of the research assistantship from year to year, the student must be in good academic standing and making satisfactory progress toward a degree.

Fee Waivers. Students must be appointed before the 12th class day of the fall or spring semester (4th class day of the summer term) as a benefits eligible research assistant with employment of at least one-half time to be eligible for fee waivers. Fee waiver forms must be completed EVERY semester and submitted to the Bursar's office for processing. The student must be employed for 4 ½ months in a semester to qualify for the waivers. If the student leaves early or does not meet the 4 ½ month criteria, the fee waivers will be revoked and the student will be required to pay the balance due.

1. **Fee Assistance Program**: Exempts, by Board of Regents action, the student from the payment of Institutional Tuition Student Services Fee, Information Technology Fee, Library Fee, University Fee, Recreation Center Fee, and Course Fees.
2. **Non-Resident State Tuition Exemption Form**: Exempts a student from the payment of non-resident tuition over and above the state resident rate.
3. **Medical Services Waiver Form**: Waives the student from payment of the Medical Services Fee.

GSBS submits fee waivers for all GSBS students that have research assistantships.

For additional information on student employment,
please refer to HSC OP 70.27 – Appointment of Student Employees

Student Health Information

Purpose: To define the availability of health services to graduate students.

1. **STUDENT FEES**: All HSC students are required to pay the TTUHSC Medical Services Fee each semester. With this fee, you can access healthcare in the clinic and see a nurse or physician at no charge for minimal or limited minor problems. Students who hold research assistantships may elect to waive the medical services fee since they are considered employees and are eligible for employee health benefits. More information on this fee and its benefits can be located at the Student Services Site.

2. **REQUIRED HEALTH INSURANCE**: All GSBS students are required to have adequate health insurance, which is separate from the Medical Services Fee. GSBS requires students to bring their insurance cards to the office to prove insurance coverage in February of every year. Options for health insurance include:
    a. Research assistantships are eligible to pay for employee health benefits. You must visit Human Resources to sign up for this insurance.
    b. Students may purchase the HSC Academic Health Plan. For more information on this plan see the Student Services Site.
    c. Students may purchase health insurance outside of the HSC.
    d. Students may be covered by their family insurance plan.

3. **IMMUNIZATION AND SCREENING FEE:** Each Fall students are assess an Immunization and Screening Fee that includes the initial validation and maintenance of immunization records as required for Healthcare Personnel. Immunization records are kept up to date through the Office of Institutional Health. Annual services provided are TB screening,

Influenza Vaccine, and completion of Hepatitis B vaccine post matriculation. The Office of Institutional health also provides follow up for any blood borne pathogen exposure that may occur while you are a student at TTUHSC.

Course Listing

How to Read Catalog Course Descriptions
Courses are listed by program/concentration, beginning with interdisciplinary GSBS course offerings. Not all courses listed in this catalog are offered every year. The university reserves the right to cancel any scheduled course or withdraw any program from the list of offerings when the best interests of the institution require such action.

Example GSBS 5101

5101.Responsible Conduct of Research (1:1:0). This course will address the regulatory and ethical environment of today's biomedical research as well as such topics as authorship and data management. The class format is lectures and case discussions. Course is required for all GSBS students.

Subject Prefix – indicates course subject (GSBS = Interdisciplinary Graduate School of Biomedical Sciences)

First digit in course number – Indicates the academic level of the course. Graduate standing is a prerequisite for enrollment in all courses numbered in the 5000 series or above and are intended only for graduate students (except for seniors who are within 12 hours of graduation and whose enrollment has been authorized by the GSBS Dean). Although graduate students occasionally enroll in undergraduate courses to fill out deficiencies in their preparation for graduate work, coursework credited toward a graduate degree must, except in rare instances and with prior GSBS Dean approval, be of graduate level (5000 series or above).

Second digit in course number – Indicates the semester hour credit of the course. Thus, GSBS 5101 is a graduate-level course with 1 semester hour of credit.

Last two digits of course number – The distinguishing numbers of the course.

Numbers in Parentheses (1:1:0) – The first number denotes the total number of credit hours for a course, the second number represents lecture hours, and the third number represents lab hours. When the letter V precedes the numbers (e.g., V1-6), this indicates the class is a variable credit course. Such courses are ordinarily research courses and permit enrollment for any number of hours up to the limit indicated by the second number in the parentheses.

Prerequisites – Some courses have specific prerequisites that must be met before the student can enroll.

Instructional Method – information in parenthesis after the course description describes the course instructional method, defined as:

(F) Traditional, face-to-face course;

(H) Hybrid course with combination of face-to-face and significant web-based instruction;
(O) Online course with most, if not all, web-based instruction;
(IVC) A course in which synchronous instruction is delivered via two-way transmission between an instructor and student who are not in the same physical location.

Courses with more than one instructional method (e.g., F/IVC) indicates instructional method varies by course section.

Interdisciplinary

GSBS Courses:

5099.Topics in Biomedical Sciences (V1-9). Specific areas in biomedical sciences or related research not normally included in other courses. (F)

5101.Responsible Conduct of Research (1:1:0). This course will address the regulatory and ethical environment of today's biomedical research as well as such topics as authorship and data management. The class format is lectures and case discussions. Course is required for all GSBS students. (F)

5102.How to be a Scientist: Professional Skills for the Biomedical Sciences Graduate Student (1:1:0). Teaches useful concepts in the scientific professionalism that might not be learned elsewhere: how science is conducted in the United States and at TTUHSC, the importance of oral communication in science and tips for teaching in a science classroom. (F)

5174.Core IV: Biomedical Seminar Series (1:1:0). Students will attend and participate in seminars. (F)

5201.Scientific Writing in the Biomedical Sciences (2:2:0). Tactics for effective writing and communication in the biomedical sciences. Instruction will focus on the process of writing and publishing scientific manuscripts and writing fellowship applications. Students will complete short writing and editing exercises that focus on tactics of effective, clear, and concise writing, and prepare a manuscript or application in their area of study. (F)

5275.Core V: Introduction to Biomedical Research (2:0:0). Introduces the first-year graduate student to the fundamental principles and techniques in basic biomedical research. (F)

5303.Introduction to Clinical Research (3:2:3). Students will be involved in all aspects of preparation for and execution of prospective human studies and retrospective chart reviews. The didactic training deals with the regulations and ethical considerations related to research in humans, the process of obtaining approval for a study and the requirements associated with conducting a study. Prerequisites include the required courses in the first year GSBS Curriculum and preferably at least one laboratory rotation. (F)

5310.Introduction to Statistical Methods in the Biomedical Sciences (3:3:0). Provide students explanation and application of classical test theory involving univariate statistics. The course will include discussion about classical test theory (p values, scales of measurement, assumptions of analyses, etc.) and application of this theory for various statistical analyses, such as t tests, anova, correlation. There will be a small introduction to non-parametric analyses. (F)

5311. Health Information Resources Management (2:2:0). Hands-on experience focuses on learning advanced scientific and biomedical information-seeking techniques based on current technology. Teaches the evaluation of sources, the management of data found and the primary ethics of presenting information in a paper or speech. Emphasis is to build life-long learning skills that can be applied to research and to patient care. (O)

5319. Seminar in Current Topics of Information Sciences (3:3:0). Prerequisite: Must be enrolled or accepted in a graduate program. Course varies each semester emphasizing information science topics and includes searching relevant scientific databases. (Writing Intensive.) (O)

5350. Laboratory Methods in Biomedical Sciences (3:3:0). Introduces the first-year graduate student to the fundamental principles and techniques in basic science research. Following a lecture and/or a laboratory demonstration, students conduct a well-defined laboratory exercise and provide a written report on the results. (F)

5372. Core II: Cells (3:3:0). The structure/function relationships that underlie basic cellular processes, including translation, protein trafficking, cytoskeletal organization and motility, cell adhesion, and cell division. Required for first year students. (F)

5373. Core III: Genes (3:3:0). Teaches essential scientific concepts underlying the field of Molecular Biology and Molecular Genetics. Required for first year students. (F/IVC)

5399. Topics in Biomedical Sciences (3:0:0). Specific areas in biomedical sciences or related research not normally included in other courses. May be repeated for credit. (F)

5471. Core I: Molecules (4:4:0). This course offers a broad coverage of biochemistry with an emphasis on structure and function of macromolecules, biosynthesis of small molecule precursors of macromolecules, and the pathways of intermediary metabolism**. Required for first year students.** (F)

Neuroscience (GIDN)

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

Preventive Medicine (GIPM)

6303. Principles of Epidemiology (3:3:0). 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. (F)

Biochemistry and Molecular Genetics (GBMG)

GBMG Courses:

5130. Research Presentation Skills (1:0:0). A comprehensive coverage of the most widely used research presentation methods used at national and international meetings. The course is offered at the request of a faculty member or the request of a student or group of students. May be repeated with credit. Prerequisite: Successful completion of GSBS core curriculum or consent of course director. (F)

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

6055. Research Methods (V1-6). Prerequisite: Consent of instructor. 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 dissertation research, additional rotations can be done to gain expertise in techniques applicable to research. May be repeated with change of content. (F)

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. (F)

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. (F)

6323. Advanced Molecular Genetics (3:3:0). Based on readings and discussions of primary literature in the areas of molecular genetics and nucleic acid biology. This course will give the student a firm foundation in molecular genetics and prepare the student to read, discuss, and understand literature from the disciplines of DNA and RNA structure and function, gene expression, molecular biology, molecular genetics, and genomics, and cancer biology. (F)

6333. Advanced Protein Biochemistry (3:3:0). Teaches advanced concepts in the field of protein biochemistry with emphasis on the fundamentals of protein biosynthesis, structure, and folding; methods of characterizing protein structural properties and conformation; and techniques for purifying proteins with diverse properties. Prerequisite: Successful completion of the GSBS common first year curriculum or consent of the course director. (F)

7000. Research (V1-12). (F)

7101. Biochemistry Seminar (1:1:0). (F)

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

Biomedical Studies – El Paso (GBSE)

GBSE Courses:

5010. Topics in Biochemical Studies (V1-3). Prerequisite: Consent of Instructor. Lectures in specific areas of biomedical studies not normally included in other courses. May be repeated for credit with change of content. (F)

5102. Biochemical Methods (1:1:0). Provides integrated approach to modern biochemical techniques biochemistry, cell and molecular biology, and genetics, including RNA interference and recombinant DNA techniques. (F)

5104. Biomedical Sciences Seminar (1:1:0). Students are required to attend all seminars sponsored by the Biomedical Studies Program. Students will present a seminar in their first year and a final seminar at the end of their internship (Spring semester) of the second year. Deviation from the yearly seminar presentation requirement requires approval of the Biomedical Studies graduate program committee. (F)

5201. Laboratory Methods in Biomedical Sciences (2:0:2). Introduces the first-year graduate students to the fundamental principles and techniques in basic science research. (F)

5220. Cancer Biology and Therapeutics (2:2:0). This course offers an advanced level understanding of molecular and cellular basis of cancer. The principles of cancer biology from origin of cancer to therapeutic intervention are addressed. (F)

5221. Microbial Genetics (2:2:0). This course provides coverage of current techniques of genetic analysis, molecular biology, and gene regulation in microorganisms, with an emphasis on bacteria and bacteriophages. (F)

5222. Advanced Human Genetics (2:2:0). This course will cover detailed consideration of population genetics, cytogenetics, molecular biology, and biochemistry as related to human heredity and genetic disorders. Includes discussion of research papers from the current literature. (F)

5223. The Cell Cycle and Human Diseases (2:2:0). Advanced mechanisms of DNA replication repair, meiosis and recombination, and mitosis and the genetics of cell cycle control. Defects in DNA replication and repair and human diseases. (F)

5224. Cellular and Molecular Neuroscience (2:2:0). This course addresses molecular mechanisms of neurodegeneration associated with neurodegenerative disorders, including spinal muscular atrophy, Parkinson's disease, Alzheimer's disease, Amyotrophic Lateral Sclerosis and Huntington's disease. The course will consist of lectures and critical discussions of recent research papers. (F)

5225. Immunology (2:2:0). This course will cover basic and advanced concepts in immunology including a survey of immunology as a host response to foreign agents, covering the nature of antigens and antibodies, effector and memory T cell responses, innate and adaptive immunity to microbial infections, allergic reactions and tumor immunology. (F)

5301. Core I: Biochemistry (3:3:0). This course will teach structure, biosynthesis and functions of the major classes of organic compounds with particular reference to organic molecules and their relationship to polymers, such as carbohydrates, lipids, proteins, and nucleic acids. (F)

5302. Core II: Cell Biology (3:3:0). This course will teach structural details and the molecular functions of the different parts of the cell. The course will also deal with signal transduction processes and cellular functions that are required for cell growth and death. (F)

5303. Core III: Genes and Function (3:3:0). This course will teach the principles of molecular genetics. The main topics that will be covered by this course include gene structure and function at the molecular level, regulation of gene expression, organization of genetic information in prokaryotes and eukaryotes, genetic rearrangements and genetic engineering. (F)

5306. Introduction to Biomedical Sciences (3:3:0). This course will teach the basics of principles of biochemistry, cell biology and genetics. It will introduce the students to the basic concepts about carbohydrates, lipids, proteins, nucleic acids, genes and cell structure and cellular components. (F)

5640. Introduction to Biomedical Research (6:0:12). Taken as (1) A hands-on introduction to the laboratories in which a student may wish to do thesis research or (2) after a student is well established in his or her thesis research, additional rotations may be done to gain expertise in techniques applicable to the student's research by not available in the faculty advisor's laboratory. Repeatable if different methods are covered for each registration. (F)

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

7000. Research in Biomedical Studies (V1-9). (F)

Biotechnology (GBTC)

GBTC Courses:

5210.The Microbiome-Role in Health and Disease (2:2:0). Teaches the role of the microorganisms as active players in homeostasis and disease. (F)

5211.Biotechnology Innovation & Commercialization. (2:2:0). Teaches the essentials for generating and implementing innovations in biotechnology from patent laws and inventorship to developing a product prototype and business plan. (F)

5299.Biotechnology Final Report (2:0:0). A final written report and oral presentation are expected to represent independent work by the student, conducted under the supervision of the mentor, and to be written and presented clearly and concisely in proper English. Candidates must enroll in GBTC 5299 for a least 2 credit hours or until the degree is conferred, taking into account the 99 hour rule. When the degree in not conferred in the semester for which the student is enrolled, the student will earn a grade based on work completed during the semester. (F)

5330.Immunology and Immunopathology. (3:3:0). Teaches the structural and molecular basis of immunological function; diagnostic tests using immunological reagents; mechanisms of resistance against microbial and neoplastic diseases; transplantation immunology; pathology of immune-mediated diseases; prevention of disease by vaccines; pharmacotherapeutic intervention in immunological processes; contemporary topics in immunology. (F)

5335. Vaccines, Blood and Biologics (3:3:0). Teaches the current and emerging importance of vaccines and biologics as essential tools for the prophylaxis and treatment of a multitude of diseases. (F)

5337.Techniques in Biotechnology Research. (3:0:3). Through rotations in the laboratories of Biotechnology graduate concentration faculty members, standard experimental techniques used in Biotechnology are explored through a series of hands-on laboratory exercises. The objective of lab rotations are two-fold: (1) allows the student to choose a faculty mentor in which to conduct his/her masters; (2) allows the student to learn multiple experimental techniques and approaches. (F)

5338.Biochemical Methods (3:1:6). Provides integrated approach to modern biochemical techniques and present methods used to manipulate a gene, purify and characterize the enzymatic properties of the encoded protein. (F)

5340.Biology of Cancer (3:3:0). Teaches essential processes underlying the biology of cancer, from the molecular and cellular bases of cancer, to clinical manifestations, to therapy. Prerequistes: successful completion of the GSBS core curriculum or consent of the course director(s). (F)

5350.Research and Molecular Pathology. (3:3:0). This course provides expertise necessary to design and interpret research data obtained through the use of knowledge pertaining to pathology of human diseases and methods offered by modern pathology. (F)

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

6001.Biotechnology Internship (V1-9). Research and training in a private-sector or government biotechnology laboratory (by prior arrangement with program director). (F)

6101.Biotechnology Seminar (1:1:0). (F)

6202.Biomedical Informatics (2:0:2). Prerequisite: GSBS 5373. Personal laptop meeting the School of Medicine laptop guidelines is required. Provides a broad introduction to the field of

bioinformatics in medical research. Emphasizes use of modern software packages and internet-based genomic and other databases to solve research problems. (F)

6301. Introduction to Biotechnology (3:3:0). Broad coverage of topics with high current interest and utility to the medical and agricultural biotechnology industustries. Emphasizes application of technologies. (F)

7000.Research (V1-12). (F)

Cell and Molecular Biology (GCMB)

GCMB Courses:

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, hormone action, and advanced genetics. May be repeated provided that different topics are covered for each registration. (F)

5130. Research Presentation Skills (1:0:0). A comprehensive coverage of the most widely used research presentation methods used at national and international meetings. The course is offered at the request of a faculty member or the request of a student or group of students. May be repeated with credit. Prerequisite: Successful completion of the GSBS core curriculum or consent of course director. (F)

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

6055. Laboratory Methods (V1-6). Prerequisite: Consent of instructor. Taken as (1) hands-on introduction to the laboratories in which a student may wish to do thesis or 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. Repeatable if different methods are covered for each registration. (F)

6320.Advanced Cell Biology (3:3:0). Prerequisite: GSBS core curriculum or consent of course director. This will cover advanced topics in cell biology and is designed for senior students who have completed introductory cell biology courses. The topics covered will include regulatory mechanisms that control the development of metazoan organisms, cell cycle regulation, cancer, and reproductive and stem cell biology. (F)

6340.Cell Structure and Function (3:3:0). Topics include structure/function relationships involved in DNA replication, transcription, protein tracking, cytoskeletal organization and function, cell division, and adhesion. (F)

7000.Research (V1-12). (F)

7101.Seminar (1:1:0). Students will attend and participate in departmental seminars. (F)

8000.Doctoral Dissertation (V1-12). (F)

Cell Physiology and Molecular Biophysics (GPHY)

GPHY Courses:

5220.Experiments in Molecular Cell Physiology (2:0:2). A laboratory course coordinated with the topics of GPHY 5320. Students will perform experiments that illustrate basic biophysical and physiological concepts, analyze the results and interpret them. Prerequisite: current enrollment in GPHY 5320. (F)

5302.Human Physiology (3:2:0). This introductory graduate course provides the student with a basic understanding of the organ systems of the human body, including the functions, regulation and interactions. No prerequisites are required. (F)

5320.Molecular Cell Physiology (3:3:0). An introduction to the physical and chemical bases of cell physiology. This course starts with a review of physical chemistry applied to biology and focuses on membrane phenomena, muscle contraction and molecular aspects of signaling. Lecture material is supplemented by readings from textbooks, review articles and original research papers. Prerequisite: consent of the instructor. This course can be taken together with GPHY 5220. (F)

5350.Laboratory Methods in Physiology (3:0:3). Fundamental principles of physiology are explored through a series of hands-on laboratory exercises. Numerous techniques common to research in many fields will be introduced. (F)

5360.Laboratory Rotations as an Introduction to Modern Physiological Research (3:3:0). Prerequisite: Consent of instructor. Students work in a specific laboratory assisting an ongoing research project or conducting an independent research effort. (F)

5904.Systems Physiology (9:4:0). This course provides the student with a basic understanding of the organ systems of the human body. Their functions, regulation and interactions are emphasized. (F)

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

6105, 6205, 6305. Advanced Topics in Cell Physiology and Molecular Biophysics (1:1:0; 2:2:0; 3:3:0). Prerequisite: Consent of instructor. Advanced training in a specialized area of cell physiology. May be repeated for credit with change in content. (F)

7000.Research (V1-12). (F)

7101.Cell Physiology and Molecular Biophysics Seminar (1:1:0). Showcases internationally acclaimed researchers and provides the student with the most current information on a variety of interesting topics in cell physiology, as well as an introduction to state-of-the art techniques and instrumentation. (F)

7102.Readings in Cell Physiology and Molecular Biophysics (1:1:0). This course is designed to complement the Cell Physiology and Molecular Biophysics Seminar Series and provide a forum for the students to become familiar with some of the speakers publications. The readings course will examine the hypothesis that was tested, the techniques employed, the most important results obtained, and the conclusions that were drawn from the study and require that the students further develop skills in reading, analysis, integration of knowledge and oral presentation of original science articles and reviews. May be repeated for credit. (F)

7103.Advanced Topics in Cell Physiology and Molecular Biophysics (1:1:0). This course gives the student experience in organizing and presenting lectures. The overall objective is to assist the student in developing the skills required to teach in any area of cell physiology and molecular biophysics. (F)

7120.Readings in Cell Physiology and Molecular Biophysics (1:1:0). This course is designed to complement the Cell Physiology and Molecular Biophysics Seminar Series and provide a forum for the students to become familiar with some of the speakers publications. The readings course will examine the hypothesis that was tested, the techniques employed, the most important results obtained, and the conclusions that were drawn from the study and require that the students further develop skills in reading, analysis, integration of knowledge and oral presentation of original science articles and reviews. May be repeated for credit. (F)

8000.Doctoral Dissertation (V1-12). (F)

Immunology and Infectious Diseases (GIID)

GIID Courses:

5181, 5281, 5381. Selected Topics in Immunology and Infectious Diseases (1:1:0; 2:2:0; 3:3:0). Prerequisite: Biomedical Sciences core curriculum or consent of instructor. Self-study courses provide students with a specialized topic within their area of interest that is not typically offered within the Texas Tech University system. Participants must agree upon objectives, grading criteria, and deadlines. (F)

5340. Cellular and Molecular Immunology (3:3:0). Prerequisite: Core curriculum or consent of instructor. Cellular and Molecular Immunology is a study of the development of the immune system, and immunity against microbes and tumors, and disease caused by inappropriate immune responses. (F)

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

6323.Genetics and Molecular Biology of Procaryotes (3:3:0). Prerequisite: Core curriculum, GIID 6346 or consent of instructor. Current concepts on the molecular biology and genetics of procaryotes with emphasis on regulation of gene expression. (F)

6324.The Molecular Biology of Pathogenic Bacteria (3:3:0). Prerequisite: Core curriculum, introductory courses in Immunology and Infectious Diseases, or consent of instructor. Lectures and discussions concerning the molecular analysis of mechanisms by which pathogenic bacteria produce infections. The regulation and expression of virulence factors are emphasized. The course also includes writing an NIH-styles grant proposal. Students may choose to write their proposals on any virulence related subject. They are also required to present and successfully defend their proposals. (F)

6325.Advances in Virology (3:3:0). Prerequisite: Core curriculum, GIID 6347, or consent of instructor. Covers a broad range of topics including virus/host interactions, molecular pathogenesis of latent, persistent or cytolytic virus infections, and research strategies to treat and prevent viral infections. (F)

6329.Advances in Immunology (3:3:0). Prerequisite: Core curriculum, Cellular and Molecular Immunology GIID 5340 or consent of the instructor. This 3 credit course provides students with an advanced course in the discipline of Immunology. The course includes the peer review process as it relates to specific aspects of Immunology and includes Immunologic based investigations in the fields of cancer, host defense , and infectious diseases. The course is literature driven utilizing both manuscripts and research proposals as examples to understand the peer review process and attempts to bridge the gap between the textbook and the literature. Both written oral participation

by the students on specialized topics is required. Students will participate in the process of manuscript revision and mock scientific review processes associated with the government review panels and will be responsible for a written research proposal based on the present NIH R01 format. (F)

6330. Vaccine Development (3:3:0). Prerequisite: Core curriculum, Cellular and Molecular Immunology (GIID 5340), or consent of the instructor. This course will cover important steps involved in vaccine development, including antigen discovery, efficacy testing in animal models, process development, pre-clinical development and vaccination strategies. This course will combine classroom sessions by TTUHSC professors and expert vaccinologists with instructor-assigned self-reading. (F)

6335. The Pathogenesis of Infectious Disease (3:3:0). Prerequisite: Core curriculum, introduction courses in Immunology and Infectious Diseases or consent of the instructor. A study of the processes by which microorganisms produce disease in humans and how the host responds. The bacterial mycological and parasitic aspects of infectious disease will be taught. Students will be expected to understand all major bacterial, fungal, and parasitic diseases. Students must understand the mechanisms by which the virulence factors of these organisms allow them to cause their respective diseases. (F)

6340. Mucosal Immunology (3:3:0). Prerequisite: Core curriculum, Cellular and Molecular Immunology (GIID 5340) or consent of instructor. This 3 hour credit course provides students with an advanced course in the discipline of mucosal immunology. This course will utilize didactic lectures, literature reviews and faculty-led discussions to expose the students to basic concepts of mucosal immunology with particular emphasis on the intestinal immune system. Both written and oral participation by the students on specialized topics is required. Students will select and present various cutting-edge topics in mucosal immunology as well as submit a written review on a current topic related to mucosal immunology. (F)

6346. Medical Bacteriology (3:3:0). Prerequisite: Core curriculum or consent of instructor. A study of classification, structure, virulence and microorganisms that cause human disease and the ways to control these organisms. (F)

6347. Medical Mycology, Parasitology, and Virology (3:3:0). Prerequisite: Core curriculum or consent of instructor. A study of the classification, structure, and pathogenesis of fungi, parasites, and viruses that cause human disease and the ways used to control these organisms. The biology of fungi, parasites and viruses that cause human disease, the epidemiology and control of infections will be taught. Students will be expected to understand the major organisms and viruses. (F)

7000. Research (V1-12). (F)

7101. Immunology and Infectious Diseases Seminar (1:1:0). Prerequisite: GSBS 5174 or consent of instructor. Weekly seminar series designed to provide training in research data presentation and analysis. This course will allow students to develop their presentation skills by providing experiences in both written and oral communication, presentations, and critiques. Use of visual aid equipment and software is mandatory. (F)

8000. Doctoral Dissertation (V1-12). (F)

Pharmaceutical Sciences (GPSC)

GPSC Courses:

5101.Topics in Pharmaceutical Sciences (1:1:0). Special topics in pharmaceutical sciences that are not normally included in other courses. May be repeated for credit with change in content. (F)

5201.Topics in Pharmaceutical Sciences (2:2:0). Special topics in pharmaceutical sciences that are not normally included in other courses. May be repeated for credit with change in content. (F)

5210.Graduate Pharmaceutics Part 1 (2:3:0). This course will cover various pharmaceutical dosage forms and drug delivery systems. (IVC)

5211.Graduate Pharmaceutics Part 2 (2:3:0). This course will cover the basic principles of pharmaceutics for the development of formulations that are stable and therapeutically effective. (IVC)

5220.Drugs of Abuse (2:2:0). This course is designed to teach the pharmacology of different classes of abused and the physiologic and societal aspects of addiction. Course Prerequisite: Biochemistry, Principles of Drug Action and Physiology-based Pharmacology. (F)

5230.Experimental Design and Biostatistics (2:2:0). Principle of experimental research design, theoretical and practical issues of measurements and data collection; biostatistics in research design and data analyses for graduate students pursing pharmaceutical and biomedical researches. Course prerequisite: admission to TTUHSC Graduate Program of Pharmaceutical Sciences. (F)

5301.Topics in Pharmaceutical Sciences (3:3:0). Special topics in pharmaceutical sciences that are not normally included in other courses. May be repeated for credit with change in content. (F)

5307.Pharmaceutical Sciences Research Methods (3:3:3). A lecture and laboratory course designed to provide an overview of current research methods in pharmaceutical sciences under direct guidance of a faculty member. (F)

5310.Drug Design and Discovery (3:3:0). Prerequisite: GPSC 5304. Overview of new methods for quantitative SAR, computer-aided drug design, mass screening, and combinatorial chemistry. (F)

5311.Drug Development and Discovery (3:3:0). The steps and processes involved in drug development and discovery. (F)

5320.Drug Metabolism (3:3:0). Analysis of primary metabolic enzymatic systems involved in the clearance of drugs from the body and the mechanisms that regulate their activity. (F)

5325.Medicinal Chemistry (3:3:0). A comprehensive study of the chemistry molecules and their interactions to aid in the understanding of concepts such as drug discovery and design. (F)

5326.Cancer Biology and Therapeutics (3:3:0). This course is designed for graduate students studying molecular and cellular basis of cancer. It offers principles of cancer biology from origin of cancer to therapeutic intervention principles. Admission to the Pharmaceutical Sciences Graduate Program and basic knowledge of biochemistry and cell biology are required. Permission from the advisor and the team leader are also required. (F)

5329.Basic Pharmacokinetics (3:3:0). Course Prerequisite: Principles of Drug Action. Fundamentals of the kinetics of drug absorption, distribution, and elimination, with particular emphasis on application to design of dosage regimens. (F/IVC)

5330.Advanced Pharmacokinetics (3:3:0). Advanced topics related to pharmacokinetics (PK) and pharmacodynamics (PD) of drugs and their metabolites with particular emphasis on modeling strategies appropriate for PK/PD research. Course prerequisite: GPSC 5329 Basic Pharmacokinetics and Course Director's Consent. (F)

5350.Advanced Pharmaceutics (3:3:0). Prerequisite: Drug Delivery Systems 3 or equivalent. Quantitative treatment of reactions of pharmaceutical interest. Drug decomposition, approaches to stabilization and preservation, accelerated stability analysis, complexation, and micromeritics. (F)

5356.Advanced Principles of Disease (3:3:0). Pathophysiological mechanisms at the molecular and cellular level. Lecture and discussion will cover the etiology, pathogenesis, functional changes, and clinical significance of general diseases. (F)

5362.Pharmaceutical Regulatory Affairs (3:3:0). Basic regulatory and quality assurance concepts. (F)

5370.Biotechnology (3:3:0). An introduction to the area of molecular biology, genomics, and protein chemistry. (F)

5430.Graduate Immunology (4:4:0). The student will be required to express complicated immunological concepts in written and oral form. It is expected that the student will make significant intellectual contributions to the development of the specific aims of the team members' grants will demonstrate independent thinking in regards to several focused areas in immunology. (F)

5435.Physiology-Based Pharmacology (4:4:0) This is an integrated course of physiology and pharmacology, with an introduction to clinical pharmacology. The emphasis will be on understanding drug actions at the molecular, cellular, organ and whole organism level for select classes of drugs. (F)

5440.Biopharmaceutics (4:4:0). Prerequisite: DDS3 and kinetics or equivalent. Advanced treatment of the influence of dosage forms, route of administration, and dosage regimen on drug availability and newer technologies for targeting drug delivery to specific organs and cell types. (F)

5504.Principles of Drug Action (5:5:0). This introductory course is designed to facilitate understanding of fundamental concepts relating to drug action. It covers basic principles of pharmacology, toxicology, and medicinal chemistry. Course prerequisites include the admission to the Pharmaceutical Sciences Graduate Program, and students must have passed GPSC 5510 General Biochemistry. (F/IVC)

5510.General Biochemistry (5:5:0). Chemical and molecular aspects of biological processes, including the chemistry of biomolecules, enzymology, bioenergy, biochemical control mechanisms, and molecular biology. Discussion of metabolic diseases and fundamentals of human nutrition. (IVC)

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

7000.Pharmaceutical Sciences Research (V1-12). (F)

7101.Pharmaceutical Sciences Seminar (1:1:0). Weekly seminar series designed to provide training in research data presentation and analysis. (F/IVC)

8000.Doctoral Dissertation (V1-12). (F)

Pharmacology and Neuroscience (GPHM)

GPHM Courses:

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. (F)

5225.Techniques in Pharmacological Research (2:2:6). Prerequisite: Consent of instructor. Standard experimental techniques used in pharmacological research are explored through a series of hands-on laboratory exercises. Numerous techniques common to research in many fields will be introduced. (F)

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. (F)

5312.Medical Pharmacology I (3:8:0). A study of pharmacology with emphasis on mechanisms of drug action, interaction, and therapeutics. (F)

5326.Pharmacology of the Autonomic Nervous System (3:3:0). A conceptual study of drugs which alter the function of the autonomic nervous system. Emphasis will be on mechanisms by which drugs affect transmitter synthesis, release, uptake, and metabolism as well as receptor function. (F)

5336.Molecular and Cellular Pharmacology (3:3:0). Prerequisite: Consent of instructor. Course focuses on experimental methods employed in pharmacological research. Topics include expression cloning, photo-affinity labeling, gene microarrays, patch clamp recording, etc. This course will consist of selected topics, lectures and student discussions. (F)

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. (F)

6000.Master's Thesis (V1-8). (F)

6331.Principles of Toxicology I (3:3:0). Prerequisite: Graduate standing in the department or consent of instructor. First half of a two-semester course. Examines the foundations of toxicological sciences. Covers principles, disposition, and first half of toxicological mechanisms. (F)

6332.Principles of Toxicology II (3:3:0). Prerequisite: GPHM 6331. Second half of a two-semester course. Covers remaining toxicological mechanisms, toxic agents, and applied toxicology. (F)

7000.Research (V1-12). (F)

7101.Pharmacology Seminar (1:1:0). Prerequisite: Consent of instructor. This course will enhance student skills in scientific public speaking through a series of seminars that are critiqued by the Department of Pharmacology & Neuroscience faculty. Weekly seminars are designed to provide training in research data presentation and analysis or critical evaluation and presentation of a manuscript in press. A required course for pharmacology and neuroscience graduate students, it is taken during the fall and spring semesters. The course is designed such that students must interact by participating in the questions and answer component of all seminars as well as during lunch with invited speakers. Grades are determined by faculty evaluation of seminar presentation and by participation during seminars. (F)

8000.Doctoral Dissertation (V1-12). (F)

Pre-Medical Sciences (GMED)

GMED Courses:

5001.Gross Anatomy (V1-9). A highly integrated introductory course of anatomical study (including human dissection) which embodies the gross morphology of the body and coordinates it with clinical, developmental, and microscopic aspects of the human body. Enrollment limited to students admitted to the Pre-Medical Sciences concentration. (F)

5002.Biology of Cells and Tissues (V1-9). Biology of Cells and Tissues is designed to provide students with fundamental information concerning the traditional areas of biochemistry, histology, and cell biology. The principles presented in this course will proceed from molecules to cells and then to tissues integrating structure and function. Enrollment is limited to students admitted to the Pre-Medical Sciences M.S. concentration. (F)

5004. Advanced Training in Anatomy (V1-6). Students will participate in the gross anatomy laboratories as teaching assistants and attend all pre-laboratory meetings in preparation for the laboratory sessions. The students will also assist in preparing the practical exams. Prerequisites include successful completion of the first year course work in Pre-Medical Sciences. Enrollment limited to students admitted to the Pre-Medical Sciences M.S. concentration. (F)

5005.Advanced Training in Histology (V1-6). Students will participate in the histology laboratories as teaching assistants and attend all pre-laboratory meetings in preparation for the laboratory sessions. The students will also assist in preparing the practical exams. Prerequisites include successful completion of the first year course work in Pre-Medical Sciences. Enrollment limited to students admitted to the Pre-Medical Sciences M.S. concentration. (F)

5099.Topics in Pre-Medical Sciences (V1-6). Specific areas in Pre-Medical Sciences or related areas not normally included in other courses. May be repeated for credit with change of content. (F)

5110.Surgical Gross Anatomy (1:1:0). Introduction and overview to surgical approaches to different regions of the human body from a clinical perspective. Students will observe and assist surgeons with surgical dissections of cadavers. The experience in surgical anatomy will provide students with a relevant correlation of anatomy to applied surgical procedures. Enrollment limited to students admitted to Pre-Medical Sciences M.S. concentration and successful completion of GMED 5001 Gross Anatomy course. (F)

5310.Educational Project in Biomedical Sciences (3:0:3). Students will design and carry out an educational project related to topics in GMED 5001 or GMED 5002. The project will be designed according to the needs of these courses and matched to the interest of the student. Projects might include self-directed learning units/sessions, or upgrading or creation of educational materials as presented on Sakai. Enrollment limited to students admitted to the Pre-Medical Sciences M.S. concentration. (F)

6101. Seminar (1:1:0). (F)

7000. Research (V1-9). (F)

Public Health (GSPH)

GSPH Courses:

5304 Introduction to Social and Behavioral Sciences (for Non-Majors) (3:3:0). This course will focus on the behavioral sciences and their influence on public health. As a core course, this is an overview. We will briefly cover many aspects of the behavioral sciences, including individual, community, organizational, and social impacts on health. We will focus on the ecological model of health and discuss social determinants of health. (F)

5305. Social and Behavioral Sciences (for SBS majors) (3:3:0). This course is intended for students majoring in the area of Social and Behavioral Sciences. The focus of this course is on the use of behavioral science theories in the development of interventions to change individual or group behavior. We will briefly cover many aspects of the behavioral sciences, including individual, community, organizational, and social impacts on health. (F)

5306. Making Change at the Community Level (3:3:0). In this course students are introduced to the application of health education and health promotion intervention theory and methods directed toward change in organizations, communities, and governments. Topics include organizational change, mass media, community organizations, diffusion of innovations, community development, social action, and political action. Students are provided opportunities to demonstrate knowledge and gain experience in applying theory, in designing interventions, and in developing programs of intervention to affect programs, policies, and environmental conditions. (F)

5307. Introduction to Epidemiology (3:3:0). This course will introduce students to basic Epidemiology as used in Public Health practice. Students will learn to describe, measure, and analyze public health problems. They will practice outbreak investigations and learn about epidemiologic research designs. (F)

5308. Advanced Epidemiology Methods (3:3:0). This three-semester hour course will review selected articles from the epidemiologic and biostatistical literature that are of historical importance. Prerequisites: GSPH 5307, GSPH 5312. (F)

5309. Basic Environmental Health Sciences (3:3:0). This course is an overview of the major areas of environmental health and provides students with an understanding of hazards in the environment, the effects of environmental contaminants on health, and various approaches to address major environmental health problems. Areas of emphasis are environmental epidemiology, toxicology, agents of environmental disease and policy and regulation. (F)

5310. Management and Policy Sciences (3:3:0). The Management and Policy Sciences class presents competencies surrounding leadership development, health service delivery, and health policy formulation. The main focus will be on the issues in the U.S. health care system, but some global systems will be explored. The course will include application of principles of program planning, development, budgeting, management and evaluation. An historical overview of seminal policy events in U.S. history is explored through competing stakeholder dynamics. (F)

5312. Intermediate Biostatistics (3:3:0). The objective of this course is to expand upon the basic concepts of statistical reasoning developed in GSPH 5411 (Introduction to Biostatistics) to

selected applications of biostatistical analysis: simple and multiple linear regression, contingency table analysis, logistic regression, and analysis of variance. The course also includes introductions to survival analysis, repeated measures data, and nonparametric methods. Prerequisite: GSPH 5411 or equivalent. (F)

5313. Introduction to Public Health (History & Current Trends) (3:3:0). This introductory course will explore the history of public health, the successes and challenges faced by public health practitioners over the years, and the current trends in public health in the United States. Students will learn the core competencies of public health and the essential functions of public health, and how public health is practiced in the United States. (F)

5314. Planning and Development Health Promotion Interventions (3:3:0). This course will take the student through the process of intervention development, beginning with the assessment needed to understand determinants of health and behavior through the mapping of determinants, development of strategies and methods, and preparing for evaluation. Students will work in small groups on a complex public health problem and will develop an intervention to address that problem. Prerequisite: GSPH 5304 or GSPH 5305. (F)

5320. Public Health Practicum (3:3:0). The purpose of this course is to allow students to apply the knowledge and skills they are learning to public health problems within a mentored learning experience. Guided by the instructor, students will identify career goals and work interests that can be met within an appropriate public health agency or related entity. The student will develop a plan, milestones, timeline and metrics that will be used to evaluate their practical experience. Prerequisites: GSPH 5304 or GSPH 5305, GSPH 5307, GSPH 5309, GSPH 5310, GSPH 5411, GSPH 5313. (F)

5321. Program Evaluation (3:3:0). Students will learn the basics of public health program evaluation. Combining the CDC Framework for Program Evaluation with theory-based evaluation principles, students will learn how to engage stakeholders, describe public health programs, design evaluations, gather credible evidence, and justify conclusions to ensure maximum use of evaluation findings for program stakeholders and evidence-based public health programming. Prerequisites: GSPH 5304 or GSPH 5305, GSPH 5411. (F)

5322. Epidemiology Research Methods (3:3:0). This three-semester hour course will focus on the key principles and methods of epidemiologic research at an intermediate level. Practical issues, such as applied logistic regression, will be discussed. Prerequisite: GSPH 5307. (F)

5323. MPH Culminating Experience (3:3:0). The culminating experience requires the student to synthesize and integrate knowledge acquired in coursework and other learning experiences and to apply theory and principles in a situation that approximates some aspect of professional practice. The student will choose between two alternative culminating experiences. The first is the research thesis. The topic will be decided by the student and student advisor. The second option is a public health project which will be reported to faculty in both writing and oral presentation. (F)

5324. Public Health in Practice (3:3:0). This course held by subject matter experts with applied experience will use studies to illustrate the realities of public health practice. (F)

5325. Health Care Payment Systems and Policy (3:3:0). In this course we will evaluate multiple dimensions of health care cost and payment, focusing on how payment systems influence provider organization, behavior and performance and how policy is developed. (F)

5326. Emerging Theories for Public Health (3:3:0). We will discuss the scientific principles of theory surrounding the changing population health environment. In this class, students learn to

view theoretical models as tools that can be applied to explain retrospective population health behavior, as well as, forecast future behavior change in human populations. Theoretical constructs, variables, and operationalized measures of theory are applied in the scientific analysis of both open and closed systems that allow for a contrast of for-profit, non-profit, and government systems of healthcare. The class is conducted in a seminar format. No textbook is required. Journal articles are provided by the professor. (F)

5327. Social Epidemiology/Social Justice (3:3:0). This class will use methods of social epidemiology and readings in the field to understand social justice issues and social determinants of health. Class discussion will center on social justice issues and possible solutions. (F)

5328. Chronic Disease Epidemiology (3:3:0). This course addresses the etiology, prevention, distribution, natural history, and treatment outcomes of chronic health conditions, and their impact on public health. (F)

5329. Issues in Rural Health (3:3:0). This course will explore the issues in rural health, including lack of access to care, substance abuse, mental health, farm safety, and unintentional injury. (F)

5330. Toxicology and Public Health (3:3:0). This course is designed to cover the basic concepts of toxicology, including an examination of major classes of pollutants, mechanisms of toxicity and the relationship between human disease and exposure to environmental chemicals. This course also applies these concepts to effects on general and susceptible populations, risk communication and public health practice. (F)

5331. Global Health Issues (3:3:0). This course will explore issues of global health and public health responses to those needs. (F)

5332. Quality Improvement in Healthcare (3:3:0). The purpose of this course is to explore the concept of Quality and the process of Quality Improvement across the Health Care continuum. We will discuss the history and evolution of quality, its terms, principles, theories, and practices. Students will review methods of improving quality, including but not limited to continuous Quality Improvement and Total Quality Management, and to the guidelines for implementing quality management and continuous quality improvement processes. Students will also be asked to think creatively to design novel ways of improving quality. (F)

5333. Qualitative Research Methods (3:3:0). This course will include sessions on: introduction to qualitative research, research design, ethnography, conducting a literature search, qualitative interviewing, recruitment and sampling, mixed methods, focus groups, thematic qualitative data analysis, ethics, and the quality of qualitative research. (F)

5334. Community Based Research Methods (3:3:0). In this course we will explore community based research methods in Public Health, including Community Based Participatory Research (CBPR). We will discuss the history and principles of community based research, the ethics of this type of research and methods to involve communities in our research. (F)

5335. Reproductive Epidemiology (3:3:0). An introduction to maternal and child health (MCH) epidemiology. Readings from the textbook will be supplemented with several journal articles. Guest speakers from the discipline of MCH, obstetrics, and neonatology will deliver selected lectures. (Prerequisite: GSPH 5307). (F)

5336. Digital Media in Public Health (3:3:0). This class will explore the use of social and digital media as it is currently being used in the field of public health. Class will include discussions of innovative public health programming ideas, and evidence-based practices using social and digital media. (F)

5411. Introduction to Biostatistics (4:3:1). This course will introduce students to basic biostatistics as used in public health practice. Students will learn to describe, measure, and analyze public health problems. Course Prerequisite: College-level Algebra. (F)