TEXAS TECH UNIVERSITY
HEALTH SCIENCES CENTER
Graduate School *of* Biomedical Sciences™

Department of Immunology and Molecular Microbiology

Immunology and Infectious Disease Program

Graduate Student Policy Manual

(Revised 10/26/2018)

Immunology and Infectious Diseases Concentration
Graduate Student Program Policy Manual

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MISSIONS

Master of Science Degree (M.S.) Program

The Immunology and Infectious Diseases M.S. program is designed to graduate exceptionally well-trained professionals who possess the necessary background and experience for a career as a technical expert in an academic or government research laboratory or in a biotechnology or pharmaceutical company. This individual will also be competent to teach microbiology and immunology at the junior college level, to undergraduates as an Instructor, or to graduate and medical students as Teaching Assistants. Additionally, this individual will exhibit competence in immunology and molecular microbiology in order to pursue advanced degrees; such as, a Ph.D., M.D. or D.V.M or additional programs, such as an M.B.A. or J.D.

Doctoral (PhD) Programs

In support of the Graduate School of Biomedical Science's commitment to training scientists and/or educators, Immunology and Infectious Diseases provides students with a choice of *two* PhD programs: The standard Doctoral (PhD) Program is designed for those students who wish to pursue research-oriented positions in academia or the private section following graduation. Our second program is called the Medical Microbiology Doctoral (PhD) Program and is designed for those students who are interested in pursuing positions in clinical/regulatory laboratories. Graduates of *both* PhD programs will be well-trained professionals who will possess the necessary background and experience for a career in an academic institution or as a research scientist in a biotechnology/pharmaceutical company. In addition, graduates from *both* PhD programs will be competent to teach immunology and microbiology to undergraduate and/or graduate students as well as train graduate students and postdoctoral research fellows. Students who receive their PhD in our Medical Microbiolgy Doctoral program and pass the certification exam offered by the American Society for Clinical Pathology will be qualified to work in clinical microbiology laboratories associated with hospitals and health care facilities, commercial and reference facilities and federal and state organizations (e.g. Food and Drug Administration, Center for Disease Control, etc).

ADMINISTRATION

Joe Fralick, PhD, Graduate Advisor

Lisa Moran, Graduate Student Coordinator

Julie Forrest, MBA, Administrator

GRADUATE SCHOOL OF BIOMEDICAL SCIENCES POLICIES

Additional guidelines may be found at http://www.ttuhsc.edu/gsbs/catalogs.aspx.

GENERAL INFORMATION

Enrollment. Entering students with Bachelor's degrees may be recommended for admission either into the Master's or Doctoral graduate programs in the Graduate School of Biomedical Sciences at the discretion of the Immunology and Infectious Diseases graduate faculty, depending on qualifications and career objectives (adopted 04/21/81).

The Program Graduate Advisor (PGA) will be responsible for the orientation of newly enrolled graduate students. The PGA will provide guidance for the new student until the student has determined an area of research interest and has selected a permanent supervising professor (adopted 10/13/82).

1st Year Core Curriculum. All **PhD** students are required to enroll in the first year core curriculum as outlined by the Graduate School of Biomedical Sciences policy. **M.S.** students must take *one of the Core Courses I-III* as well as Core IV, Core V, and Responsible Conduct of Research. The core curriculum consists of the following courses:

Course #	Course Name	Hours
GSBS 5471	Core I: Molecules	4
GSBS 5372	Core II: Cells	3
GSBS 5373	Core III: Genes	3
GSBS 5174	Core IV: Biomedical Seminar Series	1
GSBS 5099	Core V: Introduction to Biomedical Research	2
GSBS 5098	Lab Rotations	6
GSBS 5101	Responsible Conduct of Research (Spring)	1
		20 hrs

Students must achieve a grade of "B" or better in the core curriculum. Failure to achieve a "B" grade can result in the student's dismissal from the graduate program. Students may test out of the course by demonstrating a strong educational background in these courses (as determined by a majority vote of the coordinating department's faculty) or by taking a faculty led written and oral examination in the core courses. Specific course requirements may be waived, by a majority vote of the Immunology and Infectious Diseases graduate faculty, for students who have successfully completed an equivalent course at another institution (adopted 02/26/81, amended 04/28/98, 07/03/00).

M.D./Ph.D. students will be able to transfer 30 hours of didactic lectures to their PhD program following successful completion of their second year of medical school. Student schedules will be approved by the coordinator/mentor/graduate advisor until a degree plan has been approved by the student's committee (adopted 08/02/06, amended 08/07).

Graduate Assistantships. Graduate Research Assistantships are part-time positions that are available to *PhD graduate students* who are enrolled full time. Full time enrollment is minimally 9 hours for the Fall and Spring semesters and 6 hours for the summer term. Criteria and procedures for appointment and retention of an Assistantship are described elsewhere. Assistantships are intended to provide part-time employment that is compatible with full-time pursuit of a graduate degree. Appointees are expected to devote full-time effort to their overall course, research and assistantship responsibilities (adopted 06/21/89).

Immunology and Infectious Diseases Seminar. Except for the students enrolled in the 1st Year Core Curriculum, *all graduate students* are required to attend and participate in the Immunology and Infectious Diseases Seminar series (GIID 7101) each semester that they are enrolled in graduate school (adopted 08/12/81).

Advisory Committee. An advisory committee will be formed for each graduate student at the time the student is assigned a mentor. The committee will be chaired by the student's mentor and will meet shortly after its formation to review the student's proposed research project and to make recommendations about the student's program of study. There will be a minimum of three members on a Master's candidate advisory committee and a minimum of four faculty members from the Immunology and Infectious Diseases concentration and one faculty member outside the concentration on a PhD candidate's advisory committee.

Mastery. Satisfactory completion of the first year core curriculum, Immunology and Infectious Diseases Introductory courses, Immunology and Infectious Diseases advanced courses with a grade of "B" or better will indicate a mastery of the fundamentals of Immunology and Infectious Diseases. (adopted 07/14/92, amended 08/02/06).

Professionalism. All students enrolled in the Immunology and Infectious Diseases Concentration are required to maintain a level of excellence and to comply with the policies of Texas Tech University and Texas Tech University School of Medicine. The Graduate School of Biomedical Sciences has the right to place on probation or suspend any graduate student who does not maintain a satisfactory academic standing. Students who are conditionally admitted to a degree program are automatically on probation. Failure to fulfill the conditions stipulated at the time of admission will result in dismissal from the program (adopted 08/10/99).

Every student is expected to maintain a high level of commitment to professional development in a variety of areas. If any aspect of a student's professional development (for example, attention to teaching responsibilities, appropriate growth toward development of critical thinking skills or appropriate progress toward research goals, etc.) is considered to be unsatisfactory by either the Immunology and Infectious Diseases graduate faculty or the student's advisory committee (if one

has been appointed), the student shall be so informed in writing, along with a description of the recommended corrective action and the period of time allowed for the corrective action to be taken. If the student fails to correct the deficiency, the graduate faculty or advisory committee may recommend dismissal of the student from the program (adopted 08/10/99).

Academic Probation. If a student's grade-point average for any semester falls below a 3.0 (based upon a 4.0 scale), the student will be placed on academic probation. In order to be removed from academic probation, a student must receive a 3.0 grade-point average for the next semester in which he or she is enrolled. Failure to do so will result in suspension from the department. Regulations governing probation will be determined by each student's cumulative grade-point average, although all students need at least a 3.0 grade point average to graduate. Suspended students may reapply to the Graduate School of Biomedical Sciences for readmission. A grade below a B in more than one required course may be grounds for dismissal (adopted 08/17/92).

Students may also be suspended for behavior unbecoming to a professional, such as cheating, falsifying research data, or plagiarism (adopted 07/08/87).

Student Appeals. The student appeals policy covers specific grievances arising from matters affecting students' academic standing and performance, such as disputes concerning comprehensive examinations, theses and dissertations, and graduate assistantships. Appeals may be made only when alleged prejudicial, arbitrary or capricious action is involved. The burden of proof of unfair influence or action rests with the student. A student wishing to appeal a decision or action first should discuss the matter with the faculty member or members involved. If the student is not satisfied with the outcome of this effort, the student should contact the graduate advisor and/or the Chairperson of the department. This contact, like that with the faculty members, normally is informal, and the Department Chairperson may take whatever action he or she deems advisable in attempting to resolve the issue. All parties involved should make every effort to resolve the issue without going beyond this level. The Department Chairperson may consult with the Immunology and Infectious Diseases graduate faculty for advice regarding his or her actions in an appeal. If the student still is not satisfied following these meetings and discussions, the student may make a formal appeal to the Associate Dean of the Graduate School of Biomedical Sciences. The appeal shall be processed according to the rules of the Graduate School in effect at that time (adopted 08/10/99).

Master of Science (M.S.) Degree

Degree Plan. A minimum of 25 hours of graduate work for the M.S. degree in the Immunology and Infectious Diseases Concentration ***(IID)*** including:

Core Curriculum		
GSBS 5471	Core I: Molecules[1]	
GSBS 5372	Core II: Cells[1]	
GSBS 5373	Core III: Genes[1]	3h
GSBS 5174	Biomedical Seminar Series	1h
GSBS 5101	Responsible Conduct of Research	1h
	Total	***5h***

IID Required Courses		
GBTC 52XX	**Fundamentals Microbiology and Immunology[2]**	4h
	Total	***4h***

Upper Level/Required Courses		
GIID 63XX	Micro upper level course	3h
GIID 7101	Microbiology Seminar[3]	4h
GIID 7000	Research	9h
	Total	**16h**
	Total Graduate Work hours[4]	***25h***

[1] M.S. students may choose one of the three Core I-III.
[2] M.S. students must complete two of the three GBTC Fundamental Immunology and Infectious Diseases 2 hr courses.
[3] Immunology & Infectious Diseases students are required to enroll for seminar each semester that they are in residence.
[4] It should be understood that the 25 graduate work hours represent a minimum and that the student may be required to take additional courses that impact on his/her research (adopted 03/23/93).

*See the attached "Suggested Schedule of Required Courses in M.S. Program"

DOCTORAL (PhD) PROGRAM

Degree Plan. A minimum of 48 hours of didactic instruction* plus 12 hours research and 12 hours dissertation is required for the Ph.D. degree in the Immunology and Infectious Diseases Concentration including:

Core Curriculum[1]		
GSBS 5471	Core I: Molecules	4h
GSBS 5372	Core II: Cells	3h
GSBS 5373	Core III: Genes	3h
GSBS 5174	Core IV: Biomedical Seminar Series	1h
GSBS 5275	Core V: Intro to Biomedical Sciences	2h
GSBS 5098	Lab Rotations	6h
GSBS 5101	Responsible Conduct of Research	1h
	Total	***20h***

Fundamental Microbiology and Immunology Course[2]		
GBTC 52XX	Fundamental Micro and Immunology	4h
	Total	***4h***

Upper Level/Required Courses		
GIID 63XX	Micro/Immunol upper level course	3h
GIID 63XX	Micro/Immunol upper level course	3h
GIID 7101	Microbiology/Immunol Seminar[3]	7h
	Electives/Selected Topics[4]	11h
	Total	***24h***
	Total didactic hours	***48h***

[1] Ph.D. students must take all core curriculum courses as outlined by the GSBS policy and procedures.

[2] Ph.D. students must complete two of three GBTC 52XX Fundamentals of Microbiology and Immunology 2 hr courses.

[3] Immunology and Infectious Diseases students are required to enroll for seminar each semester that they are in residence.

[4] This credit requirement may be fulfilled by:

a) selection of any departmental (IID) course, including 5181, 5281, 5381 Selected Topics in Immunology and Infectious Diseases.

b) graduate level courses outside the department that are considered by the student's committee to be important are also acceptable.

c) transfer of credit for graduate level courses taken by the student at another university and considered by the student's committee and the graduate school to be of comparable quality to courses offered at TTUHSC.

* It should be understood that the 48 didactic hours represent a minimum and that the student may be required to take additional courses that impact on his/her research (adopted 03/23/93).

Medical Microbiology Doctoral (PhD) Program*

Program Plan: A minimum of 59 hours of didactic instruction plus 12 hours research and 12 hours dissertation is required for the Ph.D. degree in the Immunology and Infectious Diseases Concentration including:

Core Curriculum[1]		
GSBS 5471	Core I: Molecules	4h
GSBS 5372	Core II: Cells	3h
GSBS 5373	Core III: Genes	3h
GSBS 5174	Core IV: Biomedical Seminar Series	1h
GSBS 5275	Core V: Intro to Biomedical Sciences	2h
GSBS 5098	Lab Rotations	6h
GSBS 5101	Responsible Conduct of Research	1h
	Total	***20h***

Fundamental Microbiology and Immunology Courses[2]		
GBTC 52XX	Fundamental Micro and Immunology	4h
	Total	***4h***

Upper Level/Required Courses		
GIID 63XX	Micro upper level course	3h
GIID 63XX	Micro upper level course	3h
AHMT 3405	**Clinical Bacteriology I**[3]	**4h**
AHMT 3460	**Clinical Bacteriology II**[3]	**4h**
AHMT 4455	**Parasitology/Mycology**[3]	**4h**
AHMT 4542	**Preceptor**[3]	**8h**
GIID 7101	Microbiology Seminar[4]	7h
	Total	***33h***
	Total didactic hours	***57h***

[*] **Completion of this PhD program is required for students who wish to sit for the Medical Microbiology Certification Exam offered by the American Society for Clinical Pathology**

[1] Ph.D. students must take all core curriculum courses as outlined by the GSBS policy and procedures.

[2] Ph.D. students must complete two of three GBTC 52XX Fundamentals of Microbiology and Immunology 2 hr courses.
[3] Graduate courses offered by the School of Health Care Professionals
[4]Immunology and Infectious Diseases students are required to enroll for seminar each semester that they are in residence.
[*] It should be understood that the 59 didactic hours represent a minimum and that the student may be required to take additional courses that impact on his/her research (adopted 03/23/93).

Qualifying Examination. The purpose of the Qualifying Examination is to ensure students have mastered the fundamentals in a major area of interest and are prepared to begin working full-time on their doctoral project. After satisfactory completion of the didactic hours but before completion of the third year, each doctoral student must pass a Qualifying Examination that consists of two parts and completed during the summer of their second year:

1. A written portion prepared in such a manner as to show the student's comprehension of some field of study related to Immunology and Microbiology, ability to develop hypotheses, and competence in the design and conduct of promising and significant experiments. The written portion will be in the form of an NIH grant application that can be related to the student's research interest. The format will be in a R01 style in the current 12 page format.

2. An oral portion conducted by the Doctoral Committee and Department of Immunology and Molecular Microbiology faculty. The examination will be primarily concerned with the grant proposal and the student's understanding of fundamental concepts and principles of Immunology and Microbiology that relate to the written proposal.

The process for the examination is the same for both options:

Written Portion of the Qualifying Examination:

1. Prepare a grant proposal in an area that may (or may not) be directly related to their research.

2. The student prepares a two-page description (abstract) of the project. This includes Summary, Hypothesis, Specific Aims, a brief description of the experimental design, anticipated results, and potential problems or pitfalls according to the NIH R01 format guidelines.

3. The student's Ph.D. committee reviews the project description and votes on its suitability. *This committee will be chaired by a member of the committee that is not the student's mentor.*

4. Once approved, the student has 2 months to write a 3-year proposal on their subject in the NIH R01 12 page format using Microsoft Word®. (See the attached NIH R01 12 page format)

5. In certain cases, a list of outside reviewers (expert in the area covered by the proposal) is selected in consultation with the mentors and the student's committee and can be used in the evaluation process.

6. To potentially reduce the effort of the student and the reviewers, a preliminary review of the proposal will be conducted by a faculty member who may also be a member of the dissertation committee. This review may be in stages during the writing of the grant, or all at once when the grant is finished.

7. The reviewers are sent a copy of the exam grant, and asked to take into consideration that it is the first attempt by the student. They are allowed up to 3 weeks to finish the review. THE REVIEW IS COMPLETED FOLLOWING NIH GUIDELINES.

8. Upon receiving the reviews, the mentor makes copies of them and gives them to the student; the mentor also gives a copy of the grant proposal and the reviews to each faculty member.

9. The student has a month to respond to the reviews (i.e., modify the proposal and provide answers for the critique).

10. The student's response to the reviews will be reviewed by the student's committee.

11. A final oral exam will then be scheduled to defend the proposal (this will include all faculty).

12. The student is graded on two separate areas: the written proposal and the oral exam. Based on the critique and the general opinion of the faculty, the student may be required to re-write all or part of the exam. At the discretion of the committee's chair in consultation with student's mentor and advisory committee, the student may be required to defend the rewritten proposal.

    The students may be guided (but not told what to do or write) throughout the process. The student may meet with the mentor and any member of the committee throughout the process. The group may advise the student that such an approach is wrong or a dead-end, but would not advise a specific course of action. The group may also advise the student to re-write certain section(s) for clarity.

Oral Portion of the Qualifying Examination: (*To be completed by the end of August in the second year.*)

1. After receiving the completed research proposal, the student's committee chair will schedule the oral portion of the examination. The oral examination will be given by the Doctoral Advisory Committee. The student will present a 30-40 minute

summary of the research proposal after which time he/she will defend it and answer questions about it.

2. The Doctoral Advisory Committee will determine whether or not the student has passed the Qualifying Examination on the basis of his/her performance on the written and oral portions of the examination. The outcome will be determined by a vote of the individual members of the Doctoral Advisory Committee. A majority must find the student's overall performance to be acceptable in order for the student to pass the examination. After satisfactory completion of the student's qualifying examination, the department graduate coordinator will prepare the Admission to Candidacy form to be turned in to the Graduate School of Biomedical Sciences. The student will be notified by GSBS when the Admission to Candidacy has been approved.

Procedure When the Examination is Satisfactory

If the Qualifying Examination is considered satisfactory, the chairperson of the advisory committee will submit an Admission to Candidacy form to the department graduate coordinator for submission to the graduate school.

Procedure When the Examination is not Satisfactory

An applicant who does not pass the Qualifying Examination may be permitted to repeat it once. The repeated examination shall be conducted by the Doctoral Advisory Committee and Department of Immunology and Molecular Microbiology faculty and may cover all or parts of the oral or written portions of the examination or, in extreme circumstances, may even require a completely new research proposal, followed by an oral examination. Re-examination of the student must be completed within 8 weeks of the initial oral examination. Failure to pass the Qualifying Examination a second time will result in dismissal from the Ph.D. program irrespective of the student's performance in other aspects of the doctoral program of study. The student who fails a second time may be permitted to apply for admission to the Master (non-thesis) of Science Program (adopted 09/22/92).

Required Publications. Doctoral students will be expected to publish or have in-press at least one publication prior to defending (adopted 08/02/06). Doctoral students who do not meet this requirement may request a waiver from the graduate faculty of the Immunology and Infectious Diseases concentration. The faculty will determine the information and the form of its presentation to be included in the request. A waiver may be granted by a majority vote of the faculty (amended 10/26/07).

Dissertation Defense. The Dissertation Defense serves as a final examination for doctoral students in the Immunology and Infectious Diseases concentration. Therefore, all graduate students are required to orally present their defense.
Doctoral students, after being admitted into candidacy and at least four months after satisfactory completion of the qualifying examination, must write and orally present a defendable dissertation on their chosen, committee approved research project.

Dissertation Hours. While writing the dissertation, the student will be enrolled in and must complete at least *12 hours* of doctor's dissertation (GIID 8000), usually within 2-3 semesters.

12th Class Day. When a student is reasonably expected to successfully defend within the first 12 class days of a semester, the student will not be required to register for seminar. However, if the defense date falls after the 12th class day, the student will be required to take seminar (GIID 7101) for the semester. Students are expected to attend seminar until they have successfully defended. Exceptions to this requirement can only be granted by majority approval of the graduate faculty of the Immunology and Infectious Diseases concentration.

If the student does not defend in the anticipated semester, the student will present in seminar as required that semester. A grade of CR will be given for GIID 8000 in each semester the student is enrolled until the final defense is presented. The final grade of the written and oral defense will be determined by the student's mentor to reflect the outcome of the oral and written defense. The final grade will replace CR grades upon completion or withdrawal from the program.

Committee Attendance. All committee members and an Associate Dean's representative must be present at the defense. The student should also make an effort to include the Department Chairperson and all Immunology and Molecular Microbiology faculty. Because the defense is public, other students may also attend.

Scheduling. The student must coordinate their oral presentation with the department graduate coordinator to schedule a room with Audio/Visual and a presentation notice to be posted, allowing for two weeks prior notice.

Announcements. Doctoral candidate defenses will also be posted Lubbock HSC bulletin boards, distributed by email to Audio/Visual for posting on the tele-prompters, and distributed to the Graduate School of Biomedical Sciences for posting on the TTUHSC announcements page by the department graduate coordinator two weeks prior to the defense date.

Notification. Directly following the oral defense, the student will meet with the student's committee to discuss the defense, critique the defense, and discuss the results, as determined by the committee. The student's committee will notify the department graduate advisor of the outcome. The committee will be responsible for filling out and submitting required documentation to the department graduate coordinator.

Procedure when the defense is not satisfactory.
A student who does not receive a satisfactory evaluation may be assessed once again after an interval of four months or more. At the discretion of the Immunology and Infectious Diseases graduate faculty, a student who receives a satisfactory evaluation but who does not graduate within 12 months may be required to repeat the assessment.

^ Research hours are dependent on course load and total hours for the semester.

Suggested Schedule of Required Courses in Doctoral Programs

	PhD Program		MD/PhD Program	
YEAR 1 *Fall*	GSBS 5471 Core I: Molecules GSBS 5372 Core II: Cells GSBS 5373 Core III: Genes GSBS 5174 Core IV: Biomedical Seminar Series GSBS 5275 Core V: Intro to Biomedical Sciences	4 hrs 3 hrs 3hrs 1 hr 2 hrs	1st year Medical School courses	
Spring	GBTC 52XX Fundamental Micro & Immuno GSBS 5098 Lab Rotations GSBS 5101 Responsible Conduct of Research GIID 7101 IID Seminar	4 hrs 6 hrs 1 hr 1 hr	1st year Medical School courses	
Full Summer	GIID 7000 Research ^	6 hrs	GIID 7000 Research ^	6 hrs
YEAR 2 *Fall*	GIID 63XX GIID 63XX GIID 7101 IID Seminar GIID 7000 Research ^	3 hrs 3 hrs 1 hrs 2 hrs	2nd yr Medical School courses	
Spring	Elective/Special Topic* GIID 7101 IID Seminar GIID 7000 Research^	6 hrs 1 hr 2 hrs	2nd yr Medical School courses **Transfer of 30 hours total from SOM**	
Full Summer	GIID 7000 Research^	6 hrs	GIID 7000 Research^	6 hrs
YEAR 3 *Fall*	GIID 7101 IID Seminar GIID 7000 Research^ Elective/Special Topic GIID 8000 Dissertation	1 hr 2 hrs 3 hrs 4 hrs	IID Upper Level Course IID Upper Level Course GIID 7101 IID Seminar GIID 7000 Research^	3 hrs 3 hrs 1 hr 6 hrs
Spring	GIID 7101 IID Seminar Elective/Special Topic GIID 7000 Research^ GIID 8000 Dissertation	1 hr 2 hrs 3 hrs 3 hrs	GSBS 5101 Responsible Conduct of Research Elective/Special Topic GIID 7101 IID Seminar GIID 7000 Research^	1 hr 2 hrs 1 hr 3 hrs

Full Summer	GIID 7000 Research^	6 hrs	GIID 7000 Research	6 hrs
YEAR 4 *Fall*	GIID 7101 IID Seminar GIID 7000 Research^ GIID 8000 Dissertation	1 hr 4 hrs 4 hrs	Elective/Special Topic GIID 7101 IID Seminar GIID 7000 Research^ GIID 8000 Dissertation	2 hrs 1 hr 3 hrs 3 hrs
Spring	GIID 7101 IID Seminar GIID 7000 Research^ GIID 8000 Dissertation	1 hr 4 hrs 4 hrs	Elective/Special Topic GIID 7101 IID Seminar GIID 7000 Research^ GIID 8000 Dissertation	3 hrs 1 hr 3 hrs 3 hrs
Full Summer	GIID 7000 Research^	6 hrs	GIID 7000 Research^	6 hrs

^ Research hours are dependent on course load and total hours for the semester.

*PhD Students must complete three 2-hour or two 3-hour elective/special topic courses totaling six hours in the spring of their second semester

IMMUNOLOGY AND INFECTIOUS DISEASES COURSES OFFERED

Courses offered are dependent on expected student enrollment and are subject to change without notice.

Immunology and Infectious Diseases Introductory Courses – Offered Spring Only

GBTC 5212.Fundamentals of Bacteriology (2:2:0). The classification, structure, virulence and pathogenesis of the bacteria that cause human disease and the ways to control these organisms will be studied. This course is a Biotechnology elective offered any semester, but taken only by permission of the instructor. (H, IVC)

GBTC 5213.Fundamentals of Virology/Parasitology (2:2:0:0). The classification, structure and pathogenesis of parasites and viruses that cause human disease, as well as the epidemiology and control of infections will be taught. The course is a Biotechnology elective offered any semester, but taken only by permission of the instructor. (H, IVC)

GBTC 5214.Fundamentals of Immunology (2:2:0:0). Cellular and Molecular Immunology, immunity against microbes, tumors and diseases cause by inappropriate immune responses will be the focus of study. The course is a Biotechnology elective offered any semester, but taken only by permission of the instructor. (H, IVC)

Immunology and Microbiology Upper-Level Courses

GIID 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. **Course Director: Dr. Joe Fralick**

GIID 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-styled grant proposal. Students may choose to write their proposals on any virulence related subject. They are also required to present and successful defend their proposals. **Course Director: Dr. Abdul Hamood**

GIID 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. **Course Director: to be determined**

GIID 6329. Advances in Immunology (3:3:0). Prerequisite: Core curriculum, Cellular and Molecular Immunology GIID 5340 or consent of 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 and 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 government review panels and will be responsible for a written research proposal based on the present NIH R01 format. **Course Director: Dr. Robert Bright**

Immunology and Infectious Diseases Upper-Level Courses

GIID 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. **Course Directors: Hamood and Rumbaugh**

GIID 6340. Mucosal Immunology (3:3:0). Prerequisite: Core curriculum, Cellular and Molecular Immunology (GIID 5340) or consent of the instructor. This 3 hour credit course provides students with an advanced course in the discipline of mucosal immunology. The 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. **Course Director: Dr. Matthew Grisham**

GIID 6330. Vaccine Development (3:3:0). Prerequisite: Core curriculum, general immunology 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. **Course Director: Siddiqui**

Fall, Spring, and Summer Semesters

GIID 5181, 5281, 5381. Select Topics in Microbiology (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.

GIID 7000. Research (V1-12). Prerequisite: Core curriculum or consent of mentor. This course will allow students time to develop their research interests and thesis or dissertation projects.

GIID 7101. Immunology and Infectious Diseases Seminar (1:1:0). ***(Not offered in the summer)*** 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.

GIID 8000. Doctor's Dissertation (V1-12). Prerequisite: Admission to doctoral candidacy or consent of instructor. The doctor's dissertation is expected to represent independent work by the student, conducted under the supervision of the

committee, and to be written clearly and concisely in good English. The dissertation will be presented both in written and oral form. The oral presentation of the dissertation is meant to act as the final examination of the doctoral student. Candidates must enroll in the doctor's dissertation for at least 12 credit hours or until the degree is conferred, taking into account the 129 hour rule. When the degree is not conferred in the semester that the student is enrolled in doctor's dissertation, the student will earn a degree based on work completed during the semester.

NIH R01 12 Page Format

The following links have been obtained from Grants.gov and should be used as a reference for the PhD qualifying examination. For additional guidelines please refer to National Institutes of Health (NIH), (http://www.nih.gov).

Adobe SF424 (R&R) General Application Instruction Links for Adobe-Forms-B
The Application Instructions for this Funding Opportunity Announcement are located at the following links, in either MS Word or PDF format:
http://grants.nih.gov/grants/funding/424/SF424_RR_Guide_General_Adobe_VerB.doc (MS Word)
http://grants.nih.gov/grants/funding/424/SF424_RR_Guide_General_Adobe_VerB.pdf (PDF)

Applicants are encouraged to return to these links for the most current revision of these instructions.

General Information and Help Links
SF424 (R&R) Application and Electronic Submission Information:
http://grants.nih.gov/grants/funding/424/index.htm

General information on Electronic Submission of Grant Applications:
http://grants.nih.gov/grants/ElectronicReceipt/

Finding Help:
http://grants.nih.gov/grants/ElectronicReceipt/support.htm

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