

Tuskegee University
College of Veterinary Medicine, Nursing and Allied Health
Doctoral Degree (PhD) in Interdisciplinary Pathobiology (IDPB)

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Degree Offered: Doctoral Degree (PhD) in Interdisciplinary Pathobiology (IDPB)

* For additional information please refer to the Graduate Handbook.

The Interdisciplinary Pathobiology graduate program at the College of Veterinary Medicine, Nursing and Allied Health produces successful academicians and investigators in the areas of cancer cell biology, HIV/AIDS, cancer and nano-therapy, reproductive biology, risk analysis / epidemiology, food safety and control of food intake.

Admission Requirements:

- Applicants must have completed the B.S. degree from an accredited college or university.
- Cumulative GPA of 3.0 or better
- Completed Online Application and Application Fee
- Official Transcripts from all colleges/universities (International Students must have transcripts through World Education Services –WES)
- GRE Scores at least 540 (old) or 156 (new), less than 5 years old
- Personal Statement
- 3 Recommendation Letters
- Resume or Curriculum
- *ETS/WES Scores (International students only)
- TOEFL (International students only)
- Affidavit of Support and Bank Statement (International students only)

Graduation Requirements:

- Core Courses: 10
- Elective Courses: 17
- Research/Thesis: 30
- Admission to Candidacy
- Passing of the Final Oral Examination

Advisory Committee:

During the first semester of his/her study in the IDPB, PhD program, the student and his/her Major Professor must recommend to Department Head for approval an Advisory Committee consisting of a minimum of four members including the Major Professor and the Department Head. The Advisory Committee shall also serve as the Examination Committee.

Core Courses (42 credits): Required by All Students

Course Number	Course	Credit
MBIO 0660	Biomedical Statistics	3
MBIO 0663	Biomedical Informatics	3
IBSC 0604	Integrative Molecular Biology I	4
*IBSC 0605	Integrative Molecular Biology II	4
MBIO 0600	Seminar I	1
IDPB 0602	Seminar II	1
*IBSC 0603	Integrative Biochemistry I	4
IDPB 0800	Research / Thesis	30

**Integrative Biochemistry and Integrative Molecular Biology II are core courses for Infectious Diseases and Translational Medicine focus areas.*

Elective Courses (18 credits): Determined by Student's Major Professor

Elective courses may be any graduate level courses offered at Tuskegee University or elsewhere.

Course Number	Course	Credit
Infectious Disease		
MBIO 0523	Advanced Immunology	2
MBIO 0521	Advanced Pathogenic Micro	3
IDPB 0601	Advanced Virology	2
PATH 425G	Parasitology	3
IBSC 0754	Candidate for Degree	0
IDPB 0800	PhD Thesis	30
Translational Medicine		
PHSI 0612	Clinical Physiology	2
PHSI 0313	Clinical Pharmacology	2
PHSI 0619	Molecular Toxicology	2
PHSI 0619	Special Problems in Development and Neurobehavioral Toxicology	2
PHSI 0637	Clinical Pathology Data	2
IBSC 0754	Candidate for Degree	0
IDPB 0800	PhD Thesis	30
Epidemiology and Risk Analysis		
IBSC 0601	Integrative Bioethics	3
	Health Economics	3
MBIO 0524	Exotic Animal Diseases	2
MBIO 0661	Advanced Epidemiology	3
MBIO 0662	Disease Control & Eradication	3
MBIO 0666	Special Problems in Epidemiology	2
MBIO 0518	Food Safety and Quality	2
IBSC 0754	Candidate for Degree	0
IDPB 0800	PhD Thesis	30

Transfer Credits:

The student's Advisory Committee may recommend transfer credits for up to 9 hours for graduate courses taken by the student at Tuskegee University as part of another graduate program or at any other institution. Transfer credits may be recommended under both core and elective categories.

Admission to Candidacy:

Admission to Candidacy for students who are enrolled in the Doctoral program in Interdisciplinary Pathobiology include the following:

1. Completion of all course work required for the PhD program (more than 30 credits for the students starting with a MS degree, or 60 credits for those starting with a BS degree).
2. Passing a written qualifying examination.
3. Successful oral presentation of research proposed to the Advisory Committee. Students who fail the qualifying examination after two attempts may apply for a Master's degree in any of the established programs at Tuskegee University. In such cases, the student will have to meet the oral examination requirements of the Master's degree Graduate Program.

Seminars:

A student pursuing the Doctoral Degree in Interdisciplinary Pathobiology must present two seminars. This course includes practical examples of proper conduct of research, issues with copy right violation, plagiarism, interpretation of published work among other academic requirements including discussions on basic research methods, and a review of current research topics. Oral presentations are required.

Thesis:

The final draft of the thesis/dissertation must be filed with the student's Advisory Committee at least 30 days before the date listed in the university calendar for final copies to be submitted during the semester in which the student expects to graduate. The student must present to the Dean of Graduate Programs a "Preliminary Approval Sheet" (PAS) bearing the signature of the Major Professor before the final oral examination may be scheduled and before copies of the thesis/dissertation are distributed to members of the Examining Committee.

After the "Preliminary Approval Sheet" has been signed, it should be submitted to the Dean of Graduate Programs before the final examination is scheduled and before the final draft of the thesis/dissertation is prepared for final approval. Approval of the thesis/dissertation in its final form rests with the Examining Committee.

List of Core Courses	
MBIO 0660	BIOMEDICAL STATS. CR. 3. The conceptual and theoretical bases of biomedical research designs are examined. Appropriate statistical methods, which correspond to and are consistent with the biomedical research design, will be studied. These include both parametric and nonparametric methods. Descriptive statistics, probability distributions, comparative statistics (t test, ANOVA) and causal analysis (chi square, regression and other multivariate techniques) will be covered with emphasis on inferential aspects of statistics and on the interpretation of results which would be rational and meaningful in biomedicine.
IBSC 0603	INTEGRATIVE BIOCHEMISTRY. CR. 4. IBS course development-mol.cell-organism-development-system-ecological-environmental biosciences (lecture/laboratory-

	emphases on model systems) under-girded by chemistry that bear on the aforementioned (biochemistry). Biochemical Topics: Context-Living Systems, Protein Structure and Function, Enzymes and Co-Enzymes, Metabolism
MBIO 0663	BIOMEDICAL INFORMATICS . CR. 3. This course is designed to enable biomedical students to exploit information technology (IT) to manage the expansive biomedical knowledge base systems in advancing their scholarly and professional activities. The course will emphasize the use of information technologies to create compound scientific documents, access and examine the Internet and the World wide Web(WWW), develop hypermedia systems and scientific presentation tools. Current use of bioinformatics in the new emerging area of genomics will be examined. Hands-on experience in computer applications will be emphasized.
IBSC 0605	INTEGRATIVE MOLECULAR BIOLOGY I . CR. 4. This is a graduate-level, integratively-taught course that explores the origin, modification and interactive properties of living organisms, focusing on nucleic acids. This course is team taught, with different faculty teaching, based on their areas of expertise.
IBSC 0606	INTEGRATIVE MOLECULAR BIOLOGY II . CR. 4. This course is a continuation of the concepts began in IBSC 605, IBS Molecular Biology, Part I and thus constitutes an academic year, a two semester, ordered and integrative examination of molecular, cellular, organismic, developmental, populational and ecological phenomena –whose conceptual origins rest with the unitary linkage between chemical, biological and geological cycles that support life on Earth. This second part of Molecular Biology focuses largely on RNA, post-translational processes and other complex phenomena with molecular bases. This course will include discussions of applications to RNA (ex. Cancer, Immune function, Embryology, and other topics, per the instructors' discretions.
MBIO 0600	SEMINAR I - MICROBIOLOGY . CR. 1. This course includes practical examples of proper conduct of research, issues with copy right violation, plagiarism, interpretation of published work among other academic requirements including discussions on basic research methods, and a review of current research topics. Oral presentations are and/or reports are required.
IDPB 0602:	SEMINAR II . CR. 1. This course includes practical examples of proper conduct of research, issues with copy right violation, plagiarism, interpretation of published work among other academic requirements including discussions on basic research methods, and a review of current research topics. Oral presentations are and/or reports are required.
IDPB 0800	PHD RESEARCH & DISSERTATION . CR. 30. This course deals with continuation of dissertation research for a PhD student, the candidate will have a specific topic related to any research in the area of Microbiology, Molecular Biology and Nano-Particle based diagnostic approach for isolation of microbial pathogens etc.
List of Elective Courses	
Infectious Disease	
MBIO 0523	ADVANCED IMMUNOLOGY . CR. 3. This course is designed for veterinary and graduate students who wish to pursue an advanced study of immune reactions. Emphasis is placed on clinical immunology as it relates to domestic animals. Prerequisite: MBIO 0411 and MBIO 0412 or equivalents and approval of the course coordinator.
MBIO 0521	ADV. PATHOGENIC MICRO . CR. 3. In this course, a basic introduction to research and research methodology is provided. Current research topics that emphasize pathogenic mechanisms of infectious microbes of importance in

	animal diseases are discussed. Participants are provided an opportunity to utilize various advanced immunologic and molecular biologic techniques that have application in microbial research. Prerequisite: MBIO 0411 and MBIO 0412 or their equivalent, and approval of the course coordinator.
IDPB 0601	ADVANCED VIROLOGY. CR. 2. This interesting course involves discussion of up to date and older research papers of viral diseases of human and veterinary significance.
PATH 425G	PARASITOLOGY. CR. 4. This course deals with the classification, morphology, life history, mode of transmission, pathogenicity, control, and diseases caused by parasites of importance in animals. Emphasis is placed on the identification of parasites and the diagnosis of parasitic diseases.
IBSC 0754	CANDIDATE FOR DEGREE. CR. 0
Translational Medicine	
PHSI 0612	CLINICAL PHYSIOLOGY. CR. 2. This course deals with the basic functions of the various body systems. Emphasis is placed on normal functions of those systems and how will be related to abnormalities in cases of disease statuses.
PHSI 0313	CLINICAL PHARMACOLOGY. CR. 2. This course deals with essential pharmacological principles. Emphasis is placed on drugs of veterinary significance and their respective physiochemical properties, pharmacokinetics, pharmacodynamics, mechanisms of action, indications, and contraindications. Prerequisite: PHSI 0441
PHSI 0615	MOLECULAR TOXICOLOGY. CR. 2. This course deals with the molecular aspects of the various toxic agents including pesticides, metals, poisonous plants, mycotoxins, zootoxins, drugs, feed additives, industrial and commercial toxicants, household products, and water pollutants. Emphasis is placed on the sources, physical and chemical properties, absorption, distribution, mechanisms of action, biotransformation and excretion of these agents. Prerequisite: PHSI 0442
PHSI 0619	SPECIAL PROBLEMS DEVELOPMENT & NEUROBEHAVIORAL TOXICOLOGY. CR. 2. This course deals with basic developmental aspects of the various toxic agents including pesticides, metals, poisonous plants, mycotoxins, zootoxins, drugs, feed additives, industrial and commercial toxicants, household products, and water pollutants. Emphasis is placed on the developmental problems related to these substances.
PHSI 0637	CLINICAL PATHOLOGY DATA. CR. 2. This course provides students with a problem-solving approach to the interpretation of veterinary clinical pathological data by utilizing case studies, small group discussion, self-assessment quizzes, and computerized digital images. Prerequisite: Path 0429.
IBSC 0754	CANDIDATE FOR DEGREE. CR. 0
Epidemiology and Risk Analysis	
IBSC 0601	INTEGRATIVE BIOETHICS. CR. 3. This course is open only to graduate students. There are no prerequisites. A primary goal is building student capacity to recognize and respond appropriately to ethical issues in research. In an intensive discussion and student-presentation format, the course will particularly address cases, situations, and problems that can provide practical ethical knowledge and skills for working bioscientists. A special focus will be

	ethical problems in bioscience related to race/ethnicity and work of minority bioscientists. Instructors will primarily serve as learning guides. Extensive student preparation prior to class is essential. Students are expected to participate significantly in class discussion and conscientiously contribute to group work. Independent student research will be required.
MBIO 0661	ADVANCED EPIDEMIOLOGY . CR. 3. This course will build upon the introductory course in Epidemiology (MBIO 0614). It will emphasize the analysis (both qualitative and quantitative) of the dynamics of health /ill health processes and interactions in populations, systematically. Retrospective and prospective studies, the use of epidemiologic models (both statistical dynamic) and systems analysis techniques and other problem solving tools in analytical epidemiology will be presented and applied to selected cases. Independent study and developing a research paper on a selected epidemiologic topic will be encouraged.
MBIO 0662	DISEASE CONTROL & ERADICATION . CR. 3. Approaches used to control diseases will be considered systematically with Emphasis on those infections which have implications in international health (especially tropical health) in terms of animal/human problems. Epidemiologic, Ecological and economical considerations will form the conceptual framework via which disease control concepts will be examined. Mass screening, immuno-diagnostic, biochemical and other techniques applicable in populations will be evaluated. The use of computer simulation models and other epidemiologic models in evaluating effective and economical disease control/eradication avenues will be investigated.
MBIO 0666	SPECIAL PROBLEM IN EPIDEMIOLOGY . CR. 2. This course will enable graduate students to explore special population based problems. It will be mostly independent studies under the direction of the instructor.
MBIO 0518	FOOD SAFETY & QUALITY . CR. 2. This course covers the basic properties of food borne diseases and methods to prevent them in humans and animals.
IBSC 0754	CANDIDATE FOR DEGREE . CR. 0