TOXICOLOGY (TOX)

Courses primarily for undergraduates:

TOX 4010: Principles of Toxicology
(Dual-listed with TOX 5010).
Credits: 3. Contact Hours: Lecture 3.
Prereq: BBMB 4040
Principles of toxicology governing entry, fate, and effects of toxicants on living systems. Includes toxicokinetics and foreign compound metabolism relative to toxification or detoxification. Fundamentals of foreign compound effects on metabolism, physiology, and morphology of different cell types, tissues, and organ systems. (Typically Offered: Fall)

TOX 4190: Foodborne Hazards
(Cross-listed with MICRO 4190/ FSHN 4190).
Credits: 3. Contact Hours: Lecture 3.
Prereq: MICRO 2010 *or* MICRO 3020*; 3 credits in BBMB*
Pathogenesis of human microbiological foodborne infections and intoxications, principles of toxicology, major classes of toxicants in the food supply, governmental regulation of foodborne hazards. Assessed service-learning component. Offered even-numbered years. Graduation Restriction: Only one of FSHN 4190 and FSHN 5190 may count toward graduation. (Typically Offered: Spring)

TOX 4200: Food Microbiology
(Cross-listed with MICRO 4200/ FSHN 4200).
Credits: 3. Contact Hours: Lecture 3.
Prereq: MICRO 2010 *or* MICRO 3020
Effects of microbial growth in foods. Methods to control, detect, and enumerate microorganisms in food and water. Foodborne infections and intoxications. (Typically Offered: Fall)

TOX 4900: Independent Study
Credits: 1-2. Repeatable.
Prereq: Instructor Permission for Course
Independent study with a faculty mentor. Intended for students enrolled in the Pharmacology and Toxicology minor. Graduation Restriction: Students in the Pharmacology and Toxicology minor may use no more than 9 credits of university-wide 4900 credits towards the total of 120 credits required for graduation. (Typically Offered: Fall, Spring, Summer)

TOX 4990: Undergraduate Research
Credits: 1-3. Repeatable, maximum of 3 credits.
Prereq: Instructor Permission for Course
Independent research under faculty guidance. Intended for students enrolled in the Pharmacology and Toxicology minor. Graduation Restriction: Students may use no more than 9 credits of university-wide 4990 credits towards the total of 120 credits required for graduation. Offered on a satisfactory-fail basis only. (Typically Offered: Fall, Spring, Summer)

Courses primarily for graduate students, open to qualified undergraduates:

TOX 5010: Principles of Toxicology
(Dual-listed with TOX 4010).
Credits: 3. Contact Hours: Lecture 3.
Prereq: Graduate Standing or Permission of Instructor
Principles of toxicology governing entry, fate, and effects of toxicants on living systems. Includes toxicokinetics and foreign compound metabolism relative to toxification or detoxification. Fundamentals of foreign compound effects on metabolism, physiology, and morphology of different cell types, tissues, and organ systems. (Typically Offered: Fall)

TOX 5040: Toxicology Seminar
Credits: 1. Contact Hours: Lecture 1.
Repeatable, maximum of 2 credits.
Prereq: Graduate Standing or Permission of Instructor
Presentation of a seminar about a current topic in toxicology as part of a weekly series of seminars by graduate students, faculty, and guest lecturers from off campus. Graduate student speakers will meet with the instructor at least one week prior to their formal presentation. (Typically Offered: Fall, Spring, Summer)

TOX 5150: Regulatory Toxicology
Credits: 2. Contact Hours: Lecture 2.
Prereq: Graduate Standing or Permission of Instructor
A survey course on risk analysis approaches used by toxicologists and other life and social scientists in government, industry and non-governmental organizations to inform regulatory policies and decisions under U.S. Federal statutes, including the Federal Food Drug and Cosmetic Act; the Food Quality Protection Act; the Federal Fungicide, Insecticide and Rodenticide Act; the Endangered Species Act; the Plant Protection Act; the National Environmental Policy Act; and the Toxic Substances Control Act. Topics covered include an overview of the roles and responsibilities of different U.S. Government Departments and Agencies in analyzing human; livestock and companion animal; and/or environmental risks and benefits of food products and food additives, cosmetics, drugs, pesticides, and consumer and industrial products. Offered odd-numbered years. (Typically Offered: Fall)

TOX 5290: Foodborne Toxicants
(Cross-listed with FSHN 5290).
Credits: 2. Contact Hours: Lecture 2.
Mechanisms of action, metabolism, sources, remediation/detoxification, risk assessment of major foodborne toxicants of current interest, design of HAACP plans for use in food industries targeting foodborne toxicants, discussion of toxicants from a food defense perspective. Offered online only. (Typically Offered: Fall, Spring, Summer)

TOX 5440: Aquatic Toxicology
Credits: 2. Contact Hours: Lecture 1, Discussion 1.
Prereq: Graduate Standing or Permission of Instructor
An overview of interactions between anthropogenic chemicals and aquatic ecosystems. Topics include history of aquatic toxicology, methods of toxicity testing, and species responses to toxicants. Emphasis is on aquatic pollutants of emerging concern (e.g., nanoparticles, microplastics). Offered odd-numbered years. (Typically Offered: Spring)

TOX 5460: Clinical and Diagnostic Toxicology
(Cross-listed with VDPAM 5460).
Credits: 1-3. Contact Hours: Laboratory 6.
Repeatable.
Prereq: Graduate Standing or Permission of Instructor
Advanced study of current problems and issues in veterinary toxicology. Emphasis on problem solving and interpreting clinical cases while utilizing clinical, epidemiological, and laboratory resources. Course consists highly of clinical case based material. (Typically Offered: Fall, Spring, Summer)

TOX 5540: General Pharmacology
(Dual-listed with BMS 7354/ TOX 7354). (Cross-listed with BMS 5540).
Credits: 3. Contact Hours: Lecture 3.
Prereq: Graduate Standing or Permission of Instructor
General principles; drug disposition; drugs acting on the nervous, cardiovascular, renal, gastrointestinal, and endocrine systems. (Typically Offered: Spring)

TOX 5650: Methods in Biostatistics and Epidemiology
(Cross-listed with STAT 5650).
Credits: 3. Contact Hours: Lecture 3.
Prereq: Graduate Standing or Permission of Instructor
Statistical methods commonly used in epidemiology and human and animal health studies. Overview of cohort studies, case-control studies and randomized clinical trials. Topics include inference procedures for disease risk factors, analysis of time-to-event and survival data, analysis of longitudinal studies of disease progression and health status, diagnostic test evaluation, and meta-analysis. Examples will come from recent studies of physical and mental health, nutrition and disease progression in human and animal populations. Use of statistical software: SAS or R. Offered even-numbered years. (Typically Offered: Fall)

TOX 5690: Reproductive and Developmental Toxicology
(Cross-listed with ANS 5690).
Credits: 2. Contact Hours: Lecture 2.
Prereq: Graduate Standing or Permission of Instructor
Chemical agents that target developmental and reproductive systems in animals and humans, both male and female. The influence that timeline of developmental in utero and what part of reproductive organ have on outcome of environmental exposures will be developed. The physiological changes due to exposure, and mechanistic pathways activated by xenobiotics will be defined and the consequences of these changes will be explored. Offered even-numbered years. (Typically Offered: Fall)

TOX 5700: Risk Assessment for Food, Agriculture and Veterinary Medicine
(Cross-listed with AGRON 5700/ VDPAM 5700).
Credits: 3. Contact Hours: Lecture 3.
Prereq: Graduate Standing or Permission of Instructor
Risk assessment principles as applied to biological systems. Exposure and effects characterization in human and animal health and ecological risk assessment. Risk analysis frameworks and regulatory decision-making. Introduction to quantitative methods for risk assessment using epidemiological and distributional analysis. Uncertainty analysis. Offered odd-numbered years. (Typically Offered: Fall)

TOX 5750: Cell Biology
(Cross-listed with BMS 5750).
Credits: 3. Contact Hours: Lecture 3.
Prereq: Graduate Standing or Permission of Instructor
A multi-instructor course covering major topics in cell structure and function, including: universal features of prokaryotic and eukaryotic cells, types of utilization and conversion of energy, genetic control of cell shape and functionality, internal organization of cells, communication between cells and their environment, development of multicellular systems. Students have to write a term paper. (Typically Offered: Fall)

TOX 5900: Special Topics
Credits: 1-30. Repeatable.
Prereq: Instructor Permission for Course
Contact individual faculty for special projects or topics. Graded.

Courses for graduate students:

TOX 6260: Advanced Food Microbiology
(Cross-listed with MICRO 6260/ FSHN 6260).
Credits: 3. Contact Hours: Lecture 3.
Topics of current interest in food microbiology, including new foodborne pathogens, rapid identification methods, effect of food properties and new preservation techniques on microbial growth, and mode of action of antimicrobials. Offered odd-numbered years. (Typically Offered: Spring)

TOX 6560: Mechanisms of Cellular Injury and Cancer
(Cross-listed with VPTH 6560).
Credits: 3. Contact Hours: Lecture 3.
Prereq: Instructor Permission for Course
Cellular and molecular mechanisms of carcinogenesis. (Typically Offered: Spring)

TOX 6890: Current Topics in Toxicology
Credits: Required. Contact Hours: Lecture 1.
Repeatable.
Lecture and discussion participation on current topics in toxicology. An 80% attendance is expected to satisfactorily complete the course. Offered on a satisfactory-fail basis only. (Typically Offered: Fall, Spring)

TOX 6970: Graduate Research Rotation
Credits: 1-12. Contact Hours: Laboratory 24.
Repeatable, maximum of 12 credits.
Graduate research projects performed under the supervision of selected faculty members in the graduate Toxicology major. (Typically Offered: Fall, Spring, Summer)

TOX 6990: Research
Credits: 1-30. Repeatable.
Prereq: Instructor Permission for Course
Research. (Typically Offered: Fall, Spring, Summer)

Courses primarily for professional curriculum students:

TOX 7354: General Pharmacology
(Dual-listed with BMS 5540/ TOX 5540). (Cross-listed with BMS 7354).
Credits: 3. Contact Hours: Lecture 3.
Prereq: Doctor of Veterinary Medicine Students or (Instructor Permission or Permission of College Approver)
General principles; drug disposition; drugs acting on the nervous, cardiovascular, renal, gastrointestinal, and endocrine systems. (Typically Offered: Spring)