

Training Curriculum

Course name	Course#	Credits	Course description	Term
<i>Metabolism-dependent and -independent mechanisms of toxicity</i>	VTPP 673	3	Metabolism of drugs, toxicants and carcinogens; factors that alter expression of drug-metabolizing enzyme genes; gene polymorphisms; mechanisms of action of xenobiotics and pathways of toxicity and carcinogenesis.	Fall
<i>Chemical hazard assessment</i>	PHEO 605	3	General principles of exposure assessment; chemical and biological methods for testing hazardous chemicals and complex mixtures; chemical analysis; microbial bioassays.	Fall
<i>Principles of human health risk assessment of chemicals</i>	VIBS 641	3	Use of different types of data and analysis approaches to conduct both qualitative and quantitative assessments of human health hazard; general overview of how risk assessment informs risk management decisions.	Fall
<i>Statistics in Research I</i>	STAT 651	3	A non-calculus exposition of the concepts, methods and usage of parametric and nonparametric statistical data analysis. Designed for graduate students from various disciplines other than statistics.	Fall
<i>Histology</i>	VIBS 602	4	Cell and tissue structures visualized by light microscopy and electron micrographs for functional relationships; molecular phenomena placed in context of tissues, organs and organ systems; clinical relevance of histology in disease states. Includes pathology laboratory component.	Spr
<i>Environmental toxicology</i>	VIBS 670	3	Toxic effects of drugs and chemicals on major mammalian organ systems, case studies of toxic effects of environmental exposures.	Spr
<i>Practice of evaluating human health risks of chemicals</i>	VIBS 645	2	Decision contexts in risk assessment; data requirements in each of these decision contexts; integration of knowledge across epidemiology, toxicology, exposure assessment and other disciplines into the process of making decisions about safety or hazard of chemicals.	Spr
<i>Scientific ethics</i>	VMID 686	1	Ethical issues of research and methods for resolution of such issues; conflicts in dissemination of research findings, pursuit of resources, interactions with the press and the broader public, and research translation.	Spr
<i>Pharmacology</i>	VTPP 625	3	Introduction to pharmacokinetics and pharmacodynamics; survey of major classes of pharmaceutical agents; uses, mechanisms of action and adverse reactions of drugs.	Fall Yr 2
<i>Toxicology seminar</i>	VTPP 681	1	Review and discussion of current scientific work in toxicology, physiology and related subjects.	Fall Yr 2

Sample **elective courses** for “Mechanistic Research” and “Health Assessment” track trainees for year 2:

Mechanistic Research track	Health Assessment track
Molecular Genetics (BICH 631)	Analytical Chemistry (CHEM 601 and 602)
Advanced Cell Biology (VIBS 617)	Remediation of Contaminated Sites (CVEN 682)
Immunology (VTMI 649)	Applied Epidemiology (VIBS 607)
Molecular Endocrinology (VTPP 654)	Biodegradation and Bioremediation (VIBS 614)
Advanced Mechanisms of Disease (VPAT 640)	Social & Behav. Determinants of Health (HPCH 603)
Epigenetics & Systems Physiology (VTPP 651)	Sample Survey Methodology (PHEB 607)
Food Toxicology (VIBS 619)	Biostatistics II (PHEB 603)