Molecular Toxicology

Undergraduate Student Learning Goals

Brief Overview of the Intent of the Major Program

Molecular toxicology is the mechanism based study of the adverse effects of chemicals on living organisms. Hazardous chemicals are produced and released naturally or as a result of human activities. This major provides education and training in the field of molecular toxicology and produces graduates prepared for a wide variety of careers in the health and environmental sciences.

Specific Learning Goals

- To provide preparation in critical thinking, problem solving, and analytical skills
- To provide insight and in-depth information on the interaction of natural and man-made toxicants with people, and their impact on human health and disease (Depth)
- To provide strong academic preparation for successful contributions to research, education, industry and government, and/or participation in advanced studies in health sciences (Breadth)
- To inspire students to advance the health and well being of citizens (Value)

How the Goals Connect to Learning in the Curriculum

Curriculum Area	Objectives	Goal(s)	Courses
Lower Division Science Requirements	Build a foundation in basic sciences and math. Provide a basic introduction to the field. Begin the process of helping the students to integrate the basic sciences with Toxicology and prepare students for upper division focus.	Depth Breadth Value	Chem 1A Chem 3A and 3AL Chem 3B and 3BL Bio 1A and 1AL NST 11 Physics 8A Math 16A MCB 32 and 32L
Upper Division Core	Establish the fundamentals of molecular toxicology. Establish basic understanding of toxicant, absorption, metabolism and mode of action.	Depth Value	MCB 102 MCB 140 or MCB 104 PMB C112 or PH162A NST110 NST120 NST 121 NST 193 Statistics 131A
Upper Division Restricted Electives	Explore advanced topics in toxicology including computational biology, pesticide chemistry, practical toxicology, pharmacology, and marine pollution. Provide a seminar course that will allow students to synthesize knowledge gained throughout the curriculum.	Depth Value	ESPM 100 ESPM 162 NSTC114 PH 172
Upper Division Suggestive Electives	Suggested course work that will help students focus on a specific career goal.	Breadth Value	Upper division biological courses
Lab Requirement	Provide an experiential lab experience that trains students to use basic techniques to design, execute, and analyze experiments relevant the study of toxicology.	Depth Value	NST171 NST 197 NST 199 UGIS 192 NST H196
Capstone Experience	An optional concrete experience (i.e. research project, internship) that requires active participation and a synthesis of knowledge and skills.	Value	NST H196 NST 197 NST 199