

Molecular Toxicology Major Snapshot

Department of Nutritional Sciences and Toxicology
College of Natural Resources, University of California Berkeley

The Department Nutritional Sciences and Toxicology in the College of Natural Resources at UC Berkeley offers an undergraduate major in **Molecular Toxicology**. This major combines a strong foundation in the biological and chemical sciences with specialized advanced course work focusing on the hazardous and beneficial effects of natural and man-made toxic agents. From industrially produced environmental contaminants and designer drugs to naturally occurring herbs and food products, this field of study applies molecular and computational methods to better understand how these agents interact with living organisms and what should be done to ensure human health and safety.

Career Options • Medical School • Health Professions

The Molecular Toxicology major prepares students for careers in many applications of biological or computer sciences, including environmental protection, public health, pharmacology, forensic sciences, biotechnology, the food industry, and related businesses.

The Molecular Toxicology major is also ideal preparation for medical school and other professional health programs (e.g. pharmacy, dentistry, optometry, etc). Many of the required pre-med courses are part of our curriculum (including one semester of math, general chemistry, physics, biology, biochemistry as well as two semesters of organic chemistry). Additional pre-med courses (such a second semester of math, physics and biology) can be easily added to your academic plan.

Research

Students can earn credit for laboratory work by enrolling in a Supervised Independent Study Course (NST 99 or NST 199). See the DNST advisor for more information.

- Characterizing the mode of action of naturally occurring cancer protective agents in food.
- Foodborne illness and the microbiological safety of our food and water supply.
- Environmental and cellular toxins and DNA damage.
- Identifying the antimicrobial activity of natural products.
- Iron and copper metabolism and the role of these minerals in human health and disease states.

Getting a Degree

This snapshot is an overview of the degree requirements. For more detailed information, contact the NST Undergraduate Advisor (117 Morgan Hall • 510-642-2879 • dnst@nature.berkeley.edu).

To earn a Bachelor of Science degree from UC Berkeley in Nutritional Sciences, students must complete University, Campus, College and major requirements.

Unit and GPA Requirements

All students must complete 120 units; 40 of these units must be upper division. This includes upper division courses required for the major and courses selected from the restricted elective lists. Students must have a 2.0 cumulative GPA and earn at least a C- in all courses required for the major.

University and Campus Requirements

θ AWPE

θ American History and Institutions

θ American Cultures

College Requirements

θ Reading and Composition (English R1A & R1B or equivalent)

Major Requirements

Lower Division/Subject Requirements

<i>Humanities & Social Sciences</i>	<i>Biological & Natural Resources Sciences</i>	<i>Physical Science & Mathematics</i>	<i>Lab Requirement</i>
14 units of coursework from Arts & Humanities, Social & Behavioral Sciences, Philosophy & Values, or Foreign Language (students select courses)	Nutritional Science & Tox 11 Biology 1A/1AL MCB 32 (&32L)*	Chemistry 1A Chemistry 3A/3AL Chemistry 3B/3BL Math 16A or Math 1A Physics 8A	* Students pursuing the Molecular Toxicology major are required to take a lab course in physiology OR microbiology. You may opt to take the accompanying lab with MCB 32 as a lower division student or choose to take an accompanying lab with your choice for microbiology as an upper division student.

Upper Division Requirements

θ Biochemistry & Molecular Biology (MCB 102)

θ General Genetics (MCB 140) OR Survey of Genetics (MCB 142) OR IB 141 (summer only)

θ General Microbiology (PMB/MCB 112) OR Public Health Microbiology (PH 162A)

θ *Microbiology Lab (PMB/MCB 112L OR PH 162A) **

θ Toxicology (NST 110)

θ Molecular Toxicology (NST 120)

θ Computational Toxicology (NST 121)

θ Experimental Lab course (NST 171)

θ Statistical Inferences for Social & Life Scientists (Stat 131A) or Probability & Statistics in Biology & Public Health (PH 142A)

θ Introduction to Research in Toxicology (NST 193)

Additional Upper Division Unit Requirements

Students are required to earn a total of 40 upper division units (including the classes noted above). At least 6 of the remaining units must be selected from list A of the restricted electives noted below. The balance of units can be satisfied by applying upper division courses used to satisfy the Subject Requirement, or by selecting additional courses from list A or courses from list B.

Restricted Electives

A.

θ Environmental Problem Solving (ESPM 100)

θ Bioethics (ESPM 162)

θ Introduction to Pharmacology & Toxicology (NST C112/PH 172)

θ Pesticide Chemistry & Toxicology (NST C114/ESPM C148)

θ Honors Research (NST H196)

θ Field Study Project (NST 197)

θ Independent (NST 199)

θ Risk Assessment (PH 220C)

B.

θ Biophysical Chemistry (Chem 130, 130B)

θ Environmental Microbiology (Civ Eng 114)

θ Water Chemistry (Civ Eng 115)

θ Chemical Ecology (ESPM 119)

θ Environmental Soil Chemistry (ESPM 126)

θ Medical Ethnobotany (IB 117)

θ Marine Pollution (IB 152)

θ Nutrient Function and Metabolism (NST 103)

θ Food Science (NST 106)

θ Mechanisms of Metabolic Regulation (NST 150)

θ Human Nutrition: Normal Physiology (NST 160)

θ Introduction to Epidemiology & Human Disease (PH 150A)

θ Introduction to Environmental Health (PH 150B)

θ Air Pollution (ESPM C180)

DEPARTMENT OF NUTRITIONAL SCIENCES AND TOXICOLOGY (<http://nutrition.berkeley.edu>)

COLLEGE OF NATURAL RESOURCES (<http://nature.berkeley.edu>)

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