

Nutritional Science and Toxicology

College of Natural Resources (<http://cnr.berkeley.edu/site>)

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Department Website: Nutritional Sciences and Toxicology (<http://nst.berkeley.edu>)

Overview

The research and curriculum of the Department of Nutritional Sciences and Toxicology addresses the experimental biology of nutrients, phytochemicals, and diet-borne toxicants, using the techniques of modern biology and chemical analyses to understand the relationship among diet, the metabolic genome, and optimal health/chronic disease. Our goals are to determine the molecular mechanisms of dietary affects on health, and the contribution of individual genotype to dietary responses and disease risk. This approach of metabolic biology will provide detailed insight into the impact of diet on human health and chronic disease risk. We seek to translate lab and model systems data to human physiology, and to provide outreach through cooperative extension.

Undergraduate Programs

The Department of Nutritional Sciences and Toxicology offers two undergraduate majors, nutritional science and molecular toxicology, leading to the BS degree. Courses that fulfill the lower division prerequisites for junior standing include Biology 1A; Chemistry 1A/1AL, 3A/3AL-3B/3BL; English 1A-1B or equivalent; 14 units of humanities coursework; Mathematics 16A, 16B; Molecular and Cell Biology 32, 32L; Nutritional Science 10; Physics 8A; and Statistics 2.

Nutritional Science Major

The nutritional science major combines a strong foundation in the biological and chemical sciences with a choice of one of two areas of specialization:

1. **Physiology and Metabolism** focuses on the biochemical and physiological study of nutrient use as well as the study of food properties and processing of food materials.
2. **Dietetics** prepares students for careers as registered dietitians (RDs). RDs translate the science of nutrition into practical applications for individuals and groups in clinical, food service, or community settings. Graduates of this program must complete a dietetic internship and pass a national examination to become an RD.

Molecular Toxicology, Emphasis within the Nutritional Science Major

The molecular toxicology emphasis combines a strong foundation in the biological and chemical sciences with a focus 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 give students a better understanding of

how these agents interact with living organisms and what should be done to ensure human health and safety.

Honors Program

Students who are interested in the honors program in nutritional science or molecular toxicology should apply during their junior or senior year. Students must have a 3.6 GPA in order to be eligible for the Honors Program. The honors program is individual research, NST H196, for two semesters under the supervision of a faculty member. The supervised independent honors research is specific to aspects of the nutritional sciences and toxicology major, followed by an oral presentation, and written report. Acceptance in the CNR honors program is required through an application process. Please contact the CNR Office of Instruction and Student Affairs in 260 Mulford Hall.

Minors

Students who have pursued basic coursework in biological sciences under other majors may be eligible for one of the two undergraduate minors offered by the Department of Nutritional Science and Toxicology. Both minors require a minimum GPA of 2.5 and the completion of 15 units. The minor in nutritional science requires Nutritional Science 10, 103, 160, and five additional NST upper division units. The minor in toxicology requires Nutritional Science 11, 110, C114, 115, and one or more additional NST upper division course. All courses must be taken on the Berkeley campus for a letter grade. No course substitutions are allowed. Completion of the minor will only be noted in the memorandum section of the student's UC Berkeley transcript *not* on the UC Berkeley diploma. Students who have completed the requirements for the minor should apply for departmental certification during the semester they intend to graduate. Applications are available in the CNR Student Affairs Office, 260 Mulford Hall.

Graduate Programs

The department administers three graduate programs:

1. PhD in Metabolic Biology
2. PhD in Molecular Toxicology
3. MS in Metabolic Biology

The Metabolic Biology program provides interdisciplinary training in the theory and techniques of molecular and biochemical metabolic studies of nutrients and phytochemicals in humans, and in mammals that serve as models for humans. Molecular Toxicology focuses on the adverse effects of chemicals on living organisms and how these effects are modulated by genetic, physiologic, and environmental factors.

For more information on graduate programs, please see the department's website (<http://nst.berkeley.edu/graduate>).

NUSCTX 10 Introduction to Human Nutrition 3 Units**Department:** Nutritional Sciences and Toxicology**Course level:** Undergraduate**Terms course may be offered:** Fall, spring and summer**Grading:** Letter grade.**Hours and format:** 2 hours of Lecture and 1 hour of Discussion per week for 15 weeks. 4 hours of Lecture and 2 hours of Discussion per week for 8 weeks. 6 hours of Lecture and 1.5 hours of Discussion per week for 6 weeks.

This course provides an overview of digestion and metabolism of nutrients. Foods are discussed as a source of nutrients, and the evidence is reviewed as to the effects of nutrition on health. The emphasis of the course is on issues of current interest and on worldwide problems of food and nutrition. Students are required to record their own diet, calculate its composition, and evaluate its nutrient content in light of their particular needs.

Students will receive no credit for 10 after taking 103 or 160. Formerly known as Nutritional Sciences 10.

NUSCTX 11 Introduction to Toxicology 3 Units**Department:** Nutritional Sciences and Toxicology**Course level:** Undergraduate**Term course may be offered:** Spring**Grading:** Letter grade.**Hours and format:** 2 hours of lecture and 1 hour of discussion per week.**Prerequisites:** Open to students pursuing science and non science majors.

Discussion of principles for the evaluation of toxic hazard of natural and man-made substances present in the environment, the workplace, food, drink, and drugs. The bases for species selectivity, individual variations in sensitivity and resistance, and the combined effects of toxic agents will be addressed. Issues related to the impact of toxic agents in modern society will be emphasized.

Instructors: Vulpe, Nomura, Wang

NUSCTX 24 Freshman Seminar 1 Unit**Department:** Nutritional Sciences and Toxicology**Course level:** Undergraduate**Terms course may be offered:** Fall and spring**Grading:** The grading option will be decided by the instructor when the class is offered.**Hours and format:** 1 hour of Seminar per week for 15 weeks.

The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester.

Course may be repeated for credit as topic varies. Course may be repeated for credit when topic changes. Formerly known as Nutritional Sciences 24. Instructor: Chang

NUSCTX 98 Directed Group Study 1 - 3 Units**Department:** Nutritional Sciences and Toxicology**Course level:** Undergraduate**Terms course may be offered:** Fall, spring and summer**Grading:** Offered for pass/not pass grade only.**Hours and format:** 1 hour of group study per week per unit. 1 hour of group study per week per unit. 3 hours of group study per week per unit for 6 weeks. 2 hours of group study per week per unit for 6 weeks. 3 hours of group study per week per unit for 6 weeks. 2 hours of group study per week per unit for 8 weeks.**Prerequisites:** Lower division standing and consent of instructor.

Study of special topics in nutritional sciences that are not covered in depth in regular courses.

Course may be repeated for credit. Course may be repeated for credit when topic changes. Formerly known as Nutritional Sciences 98.