

Nutritional Science: Physiology and Metabolism

Department of Nutritional Science and Toxicology

College of Natural Resources

Introduction

The **Physiology & Metabolism** specialization within the **Nutritional Science** Bachelor of Science degree program at UC Berkeley provides a strong foundation in the biological and chemical sciences. The advanced course work focuses on the biochemical and physiological study of nutrient utilization. The Physiology & Metabolism specialization explores the following topics:

- Delivery of nutrients from foods to cells and the function of nutrients in energy metabolism.
- The cellular and molecular regulatory mechanisms by which humans respond metabolically to changes in the nutritional environment.
- Dietary patterns causing nutrient imbalances and the effect these imbalances have on function and health of humans.
- The methodological and conceptual processes of nutrition and food science laboratory research.

Career Opportunities

The Nutritional Science degree provides an excellent foundation for employment in research, education, industry and government— as well as advanced studies in nutrition, health and bioscience fields. Students are encouraged to pursue internships and work experiences to assess their individual interests and establish a career path. Examples of possible fields include:

- **Industry.** Developing products and conducting research for food, chemical, pharmaceutical, and biotechnology firms.
- **Health.** Working as a professional in Medicine, Dentistry, Optometry, or Pharmacology. Many of the required pre-med courses are part of our curriculum. Additional pre-med courses can be easily added to the academic plan. Our graduates who have pursued medicine find that the upper division Nutritional Science course work, which focuses on the characteristics of nutrients and how they are processed and utilized in our body, informs their medical studies and helps them to promote good health as professionals.
- **Education and Research.** Teaching in the biological, chemical, nutrition and food sciences. Participating in scientific research to advance techniques in the biological sciences.
- **Governmental Agencies.** Advising and policy making for California agencies such as Agriculture, Health Services or for Federal agencies such as the Food and Drug Administration, U.S. Department of Agriculture, and Environmental Protection Agency.

Research Opportunities

There are many opportunities to participate in research projects conducted in faculty laboratories. Our faculty members are especially interested in the interaction among nutrition, metabolism and disease risk. Students can earn credit for laboratory work by enrolling in a Supervised Independent Study Research (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.
- Metabolism and modes of action of vitamins.
- Molecular biology of fat cell differentiation.
- Factors controlling glucose and fat production by the liver in healthy individuals, as well as diabetic and obese patients.

The Curriculum

Lower Division Requirements:

Humanities and Social Science (22 units)

- Reading and Composition (English R1A & R1B or equivalent)
- 14 additional units of course work in American Cultures, Arts & Literature, Historical Studies, International Studies, Philosophy & Values, Social & Behavioral Sciences, or Foreign Language.

Biological and Natural Resource Science (13 units)

- NST 10 Introduction to Human Nutrition
- Bio 1A/1AL General Biology
- MCB 32 and MCB 32L (IB 132 and IB 132L are also acceptable)

Physical Sciences and Mathematics (25 units)

- Chem 1A General Chemistry
- Chem 3A/3AL & 3B/3BL Organic Chemistry
- Math 16A or 1A Calculus
- Phys 8A Introductory Physics
- Statistics 2 (Stats 20, or 21, or 131 or PH 142 are also acceptable)

Upper Division Requirements (36 units):

(15 of these 36 upper division units must be taken in the College of Natural Resources)

Required Coursework:

- MCB102 Principles of Biochemistry & Molecular Biology
- NST 103 Nutrient Function & Metabolism
- NST 150 Mechanisms of Metabolic Regulation
- NST 160 Human Nutrition
- NST 170 Experimental Nutrition Laboratory
- NST 190 Introduction to Research in Nutritional Science

Remaining required units can be fulfilled by additional courses from the Suggested Elective list below:

NST 104 Human Food Practices	NST H196 Honors Thesis	MCB 130 Cell Biology
NST 106 Food Science	NST 197 Field Study	MCB 133 Cell Biology of Cancer
NST 110 Toxicology	NST 198 Directed Group Study	MCB 135 Topics in CDB
NST C114 Pest Chem & Tox	NST 199 Independent Research	MCB 140 General Genetics
NST C119 Advanced Toxicology	PMB C103 Bacterial Pathogenesis	MCB 142 Survey of General Genetics
NST 120 Molecular Toxicology	PMB C112 General Microbiology	PH 116 Issues in Medicine
NST C159 Human Diet	PMB C114 Intro to Comp Virology	PH 162A Public Health Microbiology
NST 161A Medical Nutrition Therapy	Chem C130, 130A/B Biophysical Chemistry	PH 172 Intro Pharm & Tox
NST 166 Nutrition in the Community	IB 128 Sports Medicine	
NST 193 Research in Toxicology	IB 131 Anatomy	

Free Electives (as many units necessary to reach the required 120 overall)

All courses must be taken for a letter grade with the exception of free electives or courses that are only offered on a pass/no pass basis.

For more informatio

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