Nutrition

See Clinical Nutrition, on page 203; Food Service Management, on page 315; Nutrition; Nutritional Biology (A Graduate Group), on page 457; Nutrition Science, on page 458.

Minor Program Requirements:
The Department of Nutrition offers four minor programs open to students majoring in other disciplines who wish to complement their study with a concentration in the area of food and nutrition.

Note: If the student's major program requires the same course in biochemistry and physiology, only one of the courses may duplicate credit toward the minor. Each program below lists replacement courses to fulfill the minimum unit requirement.

Community Nutrition ............................... 20
Preparation. Plan in advance to include the required course prerequisites.
Nutrition 111A and 111B ............................... 5
Nutrition 118, 192 (2 units) ......................... 6
Nutrition 120A or 120BN ............................. 4
Neurobiology, Physiology, and Behavior 101. .............................................. 5
Replacement courses; see note above:

Food Service Management ........................ 25
Preparation. Plan in advance to include the required course prerequisites.
Food Science and Technology 100A-100B, 101A-101B .......................... 12
Food Service Management 120, 120L, 122. .................................................. 9
Agricultural and Resource Economics 112. .................................................. 4
Replacement courses; see note above:
Nutrition 10, 111A, 111B, 114, 116A-116B, 120AN, or 120BN, Economics 1A-1B

Nutrition and Food ................................. 22
Preparation. Plan in advance to include the required course prerequisites.
Nutrition 111A and 111B ............................... 5
Nutrition 120A or 120BN ............................. 4
Food Science and Technology 100A-100B .......................... 12
Neurobiology, Physiology, and Behavior 101. .............................................. 5
Replacement courses; see note above:
Nutrition 114, 116A-116B, 116AL-116BL

Nutrition Science ........................................ 20
Preparation. Plan in advance to include the required course prerequisites.
Animal Biology 102 and 103, Biological Sciences 102 and 103 Nutrition 111A and 111B ............................... 11-15
Neurobiology, Physiology, and Behavior 101. .............................................. 5
Replacement courses; see note above:
Nutrition 114, 115, 116A-116B, 117, 120AN or 120BN, 122, 123, 124, 201, 204.

Minor Adviser. 3202 Meyer Hall 530-752-2512

Graduate Study. Programs of study leading to the M.S. and Ph.D. degrees are available in Nutrition. For information on graduate study contact the Nutrition Graduate Group.

Courses in Nutrition (NUT)

Lower Division

10. Discoveries and Concepts in Nutrition (3)

Lecture—3 hours. Nutrition as a science; historical development of nutrition concepts; properties of nutrients and foods. Not open for credit to students who have taken an upper-division course in nutrition. GE credit: SciEng | SE, SL—I, II, III. (II, III.) (Applicable to broader requirements)

11. Current Topics and Controversies in Nutrition (3)

Discussion—1 hour; term paper. Exploration of current applications and controversies in nutrition. Students read scientific journal articles and write summaries, as well as give brief oral presentations. Topics change to reflect current interests and issues. GE credit: SciEng, Wrt | OL, SE, WE—I, II, III, (II, III.) (Applicable to broader requirements)

99. Individual Study for Undergraduates (1-5)

Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE

Upper Division

104. Environmental & Nutritional Factors in Cellular Regulation and Nutritional Toxins (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 101; Biological Sciences 103 or Animal Biology 101. Cellular regulation from nutritional/toxico logical perspective. Emphasis: role of biofactors on modulation of signal transduction pathways, role of specific organelles in organization/ regulation of metabolic transformations, major cofactor functions, principles of pharmacology/toxicology important to understanding nutrient/toxicant metabolism. (Same course as Environmental Toxicology 104.) GE credit: SciEng | OL, SE, SL—I, II, III, (II, III.) (Applicable to broader requirements)

111AV. Introduction to Nutrition and Metabolism (3)

Web virtual lecture—3 hours. Prerequisite: Chemistry 88, Neurobiology, Physiology, and Behavior 101 or the equivalent. Introduction to metabolism of protein, fat, and carbohydrate; the biological role of vitamins and minerals; nutrition requirements during the life cycle; assessment of dietary intake and nutritional status. Not open for credit to students who have completed course 101. E credit: SciEng | SE—III, (III.) (Applicable to broader requirements)

111BV. Recommendations and Standards for Human Nutrition (2)

Lecture—2 hours. Prerequisite: Chemistry 88, Neurobiology, Physiology, and Behavior 101 or the equivalent. Critical analysis of the development of nutritional recommendations for humans. Topics include history of modern recommendations, development of the Recommended Dietary Allowance (RDA) and other food guides; The Dietary Reference Intakes (DRI); administrative structure of regulatory agencies pertinent to nutrition recommendations; introduction to scientific methods used to determine the recommendations; food labeling laws; nutrition

Quarter Offered: I—I Fall, II—Winter, III—Spring, IV—Summer. 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): A—Arts; AH—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Domestic Diversity; Wrt—Writing Experience

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; AC/AM—American Cultures; DD—Domestic Diversity, OL—Oral Skills, GL—Quantitative, SL—Scientific, VL—Visual, WC—World Cultures, WE—Writing Experience
112. Nutritional Assessment: Dietary, Anthropometric, and Clinical Measures (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Animal Biology 102 and 103 or course 101, course 111 (may be taken concurrently). Statistics 13.
Methods of human nutritional assessment, including dietary, anthropometric, biochemical and hematological techniques, and physical examination. Principles of nutrition and dietetics, and interpretation of results for individuals and populations. GE credit: SciEng | QL, SE—III. (III.) Stewart

114. Developmental Nutrition (4)
Lecture—4 hours. Prerequisite: Animal Biology 102 and 103 or course 101; course 111. Role of nutritional factors in embryonic and postnatal development. GE credit: SciEng, Wrt | SE—II. (II.) Keen

115. Animal Nutrition (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Chemistry 28. Comparative differences among animals in digestion and metabolism of nutrients. Nutrient composition of feeds, digestive systems, digestion, absorption, feeding strategies. GE credit: SciEng; Sci | II, III, IV. (II.) DePeters

116A. Clinical Nutrition (3)
Lecture—3 hours. Prerequisite: courses 111, 112 and Neurobiology, Physiology, and Behavior 101 or equivalent. Biochemical and physiological bases for therapeutic diets. Problems in planning diets for normal and pathological conditions. GE credit: SciEng | SE—II. (II.) Steinberg

116AL. Clinical Nutrition Practicum (3)
Lecture—1 hour; laboratory—3 hours; discussion—1 hour. Prerequisite: course 116A. Clinical Nutrition (may be taken concurrently). Fundamental principles of planning and evaluating therapeutic diets and patient education for pathological conditions covered in 116A. GE credit: SciEng | SE—II. (II.) Frank

116B. Clinical Nutrition (3)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 111, 112 and Neurobiology, Physiology, and Behavior 101 or the equivalent. Biochemical and physiological bases for therapeutic diets. Problems in planning diets for normal and pathological conditions. GE credit: SciEng | SE—II. (II.) Zivkovic

116BL. Clinical Nutrition Practicum (3)
Lecture—1 hour; laboratory—3 hours; discussion—1 hour. Prerequisite: courses 116AL and 116B (may be taken concurrently). Fundamental principles of planning and evaluating therapeutic diets and patient education for pathological conditions covered in 116AL. GE credit: SciEng | SE—II. (II.) Steinberg

117. Experimental Nutrition (6)
Lecture—3 hours; laboratory—6 hours; extensive writing. Prerequisite: courses 111, Biological Sciences 102 and 103, and a laboratory course in nutrition or biochemistry. Methods of assessing nutritional status. Application of chemical, microbiological, chromatographic and enzymatic techniques to current problems in nutrition. GE credit: SciEng, Wrt | SE—II. (II.) Gokhewad

118. Community Nutrition (4)
Lecture—4 hours. Prerequisite: course 101 or 111, and 116A. Nutrition problems in contemporary communities and of selected target groups in the United States and developing countries. Nutrition programs and policy, principles of nutrition education. GE credit: SciEng | SE, SL—II. (II.) Heining

119A. International Community-Based Nutritional Aid (4)
Lecture/discussion—1 hour. Prerequisite: course 112 (may be taken concurrently) and consent of instructor. Issues and problems related to community-based nutritional assessment in a low-income country, for populations in low-income countries, ethical issues in human investigation; survey design, data collection techniques, and data analysis; preparation for international travel; cross-cultural communication, health, and safety while living abroad.

119B. International Community-Based Nutritional Assessment (6)
Lecture—2 hours; fieldwork—12 hours. Prerequisite: course 119A and consent of instructor. A six-week summer course in Peru. Implementation of a community-based nutritional assessment survey, including development of the survey instrument, selection of the study sample, collection and verification of data, and preparation of the results; the project will be carried out by paired participation of students and faculty members of UC Davis and the collaborating foreign institution.

120A. Nutritional Anthropology (4)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 2 or Geography 2 recommended. Nutritional anthropology from historical and contemporary perspectives; the anthropological approach to food and diet; field exercises that explore food patterns and their nutritional implications. GE credit: SciEng or SocSci, Div | SE, SS—IV. (IV.) Kurtz

120B. Nutritional Geography (4)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Geography 2 recommended. Nutritional geography from historical and contemporary perspectives; the geographical approach to food and diet; cultural and environmental factors that influence feeding practices; food-related landscapes and patterns. GE credit: SciEng or SocSci, Div | SE, SS.

122. Ruminant Nutrition and Digestive Physiology (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: upper division standing; Animal Biology 103 or consent of instructor; Neurobiology, Physiology, and Behavior 101, Biological Sciences 1C, and Math-168 recommended. Study of nutrient utilization as influenced by the unique aspects of digestion and fermentation in ruminants, both domestic and wild. Laboratories include comparative anatomy, feed evaluation, digestion kinetics using fistulated cows, computer modeling, and microbial exercises. GE credit: SciEng | QL, SE—III. (III.) Fadel

123. Comparative Animal Nutrition (3)
Lecture—3 hours. Prerequisite: Animal Biology 103. Restricted to upper division or graduate students. Comparative nutrition of animals, including laboratory, companion, zoo, and wild animals. Digestion and metabolic adaptations required for animal species consumed for food from grasses and leaves to nectar to insects and meat. Relation of nutrition to metabolic adaptations and physiological states, including growth, reproduction, and diseases. GE credit: SciEng | SE—II. (II.) Klaing

123L. Comparative Animal Nutrition Laboratory (1)
Laboratory—3 hours. Prerequisite: Animal Biology 103, course 123 (may be taken concurrently). Laboratory exercises leading to written reports on establishment of nutritional requirements and formulation of complete diets for laboratory, companion, zoo and wild animals. —III. (III.) Klaing

124. Nutrition and Feeding of Finfishes (3)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Biological Sciences 103 and Wildlife, Fish, and Conservation Biology 121. Principles of nutrition and feeding of fishes under commercial situations; implication of fish nutrition to the conservation of endangered species. GE credit: SciEng | QL, SE, SL

127. Environmental Stress and Development in Marine Organisms (10)
Lecture—4 hours; laboratory—12 hours; discussion—2 hours; laboratory—Environmental Toxicology 101 or Biological Sciences 102 or 104 or the equivalent. Environmental Toxicology 114A or course 114 recommended. Course taught at Bodega Marine Laboratory. Effects of environmental and nutritional stress, including pollutants, on development and function in embryos and larvae of marine organisms. Emphasis on advanced experimental methods. (Same course as Environmental Toxicology 127.) GE credit: SciEng | QL, QL, SE, SL, WE—IV. (IV.) Cher
203. Advanced Protein and Amino Acid Metabolism (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: one upper division nutrition biochemistry and physiology course. Nutritional significance of protein and amino acids, including studies of the influence of dietary protein on digestion and absorption, metabolism, resistance to disease, and food intake. Study of dietary requirements and interrelationships among amino acids.

204. Mineral Metabolism (2)
Lecture—2 hours. Prerequisite: upper division nutrition or biochemistry and immunology. Studies of metabolic functions and nutritional interrelationships involving minerals.

219A. International Nutrition (3)
Lecture—3 hours. Prerequisite: graduate standing; undergraduates only admitted with consent of instructor after completion of course 111A. Epidemiology, etiology, and consequences of undernutrition, with particular focus on the nutritional problems of children and women in low income populations. Offered in alternate years.—II. Dewey

219B. International Nutrition (3)
Lecture—3 hours. Prerequisite: course 219A. Intervention programs to prevent or ameliorate nutritional problems in low income populations. Planning, implementing, and evaluating nutrition intervention programs. Offered in alternate years.—III. Dewey

230. Experiments in Nutrition: Design and Execution (2)
Laboratory—6 hours. Prerequisite: consent of instructor; courses 201, 202, 203, 204, or the equivalent recommended. Student selected projects to enhance laboratory skills. Independently, or in groups of two to three students, design, develop, carry out the experiment, analyze the results and report the findings. May be repeated for credit up to six times (limit of three times per instructor) with consent of instructor.—I, II, III, [I, III]

250. Metabolic Homeostasis (3)
Lecture—2 hours; discussion—1.5 hours. Prerequisite: passing the Nutrition Graduate Group Preliminary Examination or consent of instructor. Preference given to students with advanced standing in the Nutrition Graduate Group. Regulatory mechanisms of carbohydrate, lipid, and protein homeostasis; mechanisms of metabolic enzyme regulation and of the metabolic hormones; homeostatic mechanisms interactions; fuel-fuel interactions; nutrition energy balance.

251. Nutrition and Immunity (2)
Lecture/discussion—2 hours. Prerequisite: Pathology, Microbiology, and Immunology 126, Medical Microbiology 107 or the equivalent, Animal Biology 102. Cellular and molecular mechanisms underlying interactions of nutrition and immune function, including modulation of immune competency by diet and effects of immune responses on nutritional needs. Lectures and discussion explore implications for resistance to infection, autoimmunity and cancer. Offered in alternate years.—II. Klasing, Erickson, Stephenson

252. Nutrition and Development (3)
Lecture—3 hours. Prerequisites: courses 201, 202, 203, 204. Relationship of nutrition to prenatal and early postnatal development.—II. [II] Koen, Oteiza

253. Control of Food Intake (3)
Lecture—2 hours; discussion—1 hour; 2 or 3 laboratory demonstrations per quarter. Prerequisite: course 201 or 202 or consent of instructor. Comprehensive study of the biochemical, nutritional, behavioral, and physiological mechanisms controlling food intake. Subject matter will be approached through lectures, laboratory demonstration and discussions where students and staff will critically evaluate the literature. Offered in alternate years.

254. Applications of Systems Analysis in Nutrition (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 204 or equivalent. Introduction to the field of nutritional biochemistry. Application of mathematical models used in support of nutritional research. Offered in alternate years.

257. Selected Topics in Nutritional and Hormonal Control of Nitrogen Metabolism (2)
Lecture—2 hours. Prerequisite: courses 201 through 204, Physiological Sciences 205A-205B or the equivalent. Quantitative and qualitative aspects of nitrogen metabolism, including the regulation of dietary intake, hormones and dietary hormone interactions which affect nitrogen metabolism, including protein synthesis-degradation, amino acid synthesis-catabolism, nitrogen transport-excretion, depending on current literature. Offered in alternate years.

258. Field Research Methods in International Nutrition (3)
Lecture/discussion—3 hours. Prerequisite: graduate standing or consent of instructor. Topics related to implementation of nutrition field research in less developed countries, including ethics, relationships with local governments, communities, and scientists; data collection techniques and quality assurance; field logistics; research budgets; and other administrative and personal issues. Offered in alternate years.—II. Dewey

259. Nutrition and Aging (2)
Lecture—2 hours. Prerequisite: courses 201, 202, 203 and 204. Interaction between nutrition and aging. Topics include physiological/biochemical basis of aging, age-related changes affecting nutritional requirements and mortality rate, assessment of nutritional status in the elderly, and relationship between developmental nutrition and the rate of aging. Offered in alternate years.

260. Nutrition During Pregnancy (6)
Lecture—5 hours; term paper. Prerequisite: acceptance into the Master's Degree program of Advanced Studies in Maternal and Child Nutrition. Overview of the anatomical, physiological and biochemical changes that occur during pregnancy and early development. Discussion and evaluation of nutritional/lifestyle factors associated with pregnancy outcomes and nutrition programs/interventions for pregnant women.—I (I) Heinig

261. Lactation and Infant Nutrition (6)
Lecture—5 hours; discussion—1 hour. Prerequisite: course 260. Overview of the physiological and biochemical processes underlying human lactation and nutritional needs of the infant. Development of skills in assessment, nutrition counseling, education and support of new mothers and their families.—II. (II) Heinig

262. Child and Adolescent Nutrition (6)
Lecture—5 hours; discussion—1 hour. Prerequisite: course 261. Relationships among nutrition, growth, and development during childhood and adolescence. Nutritional assessment for normal and high risk groups; psychological and economic factors contributing to nutritional status. Nutritional needs and interventions for special groups, including obese children/adolescents, athletes, and eating disorders.—III. (III) Heinig

Lecture—3 hours; term paper. Prerequisite: graduate standing; restricted to students enrolled in the MAS program and graduate students by consent of instructor. Application of epidemiological principles to the study of maternal and child nutrition. Topics include quantitative and qualitative study procedures, including study design, data analysis, and related analytical techniques.—(I) Heinig

264A. Current Topics in Maternal and Child Nutrition: Principles of Adult Education (2)
Seminar—2 hours. Prerequisite: graduate standing; restricted to students enrolled in the MAS program and graduate students by consent of instructor. Current scientific literature related to Maternal and Child Nutrition. Topics include nutritional assessment of populations.—II. Heinig

264B. Current Topics in Maternal and Child Nutrition: Epidemiology and Evidence-Based Practice (2)
Seminar—2 hours. Prerequisite: graduate standing; restricted to students enrolled in the MAS program and graduate students by consent of instructor. Current scientific literature related to Maternal and Child Nutrition. Topics include epidemiology, evidence-based practice, breastfeeding promotion, and nutritional assessment of populations.—III. Heinig

270. Scientific Ethics in Biomedical Studies: Emphasis on Nutrition (3)
Lecture—1 hour; discussion—1 hour; term paper. Scientific ethics in biomedical studies, especially nutrition. Discussion and case study presentations on scientific integrity, fraud, misconduct, conflict of interest, human and animal research protections. Not open for credit to students who have completed course 492B.—Steinberg

290. Beginning Nutrition Seminar (2)
Lecture/discussion—1 hour; seminar—1 hour. Prerequisite: first year graduate standing and consent of instructor. A survey course on scientific literature related to Maternal and Child Nutrition. Topics include nutrition surveillance and monitoring, as well as public policy development and implementation.—III. Heinig

290C. Research Conference (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Major professors lead research discussions with their graduate students. Research papers are reviewed and project proposals are presented and evaluated. Format will combine seminar and discussion style. (S/U grading only)—I, II, III, [I, II, III]

291. Advanced Nutrition Seminar (1)
Seminar—1 hour. Prerequisite: second-year graduate standing. Advanced topics in nutrition research. Multiple sections may be taken concurrently for credit. May be repeated for credit. (S/U grading only)—I, II, III, [I, II, III]

293A. Current Topics in Obesity, Food Intake and Energy Balance (3)
Lecture—1 hour; seminar—1 hour; discussion—1 hour. Prerequisite: graduate standing or course 129. Undergraduates with upper division standing with at least one writing course may enroll with consent of instructor. Current research and its evaluation. Principles of experimental design and scientific background for given article. Articles summarized for posting on Internet for use by healthcare professionals. May be repeated for credit with consent of instructor.

293B. Current Topics in Obesity, Food Intake and Energy Balance with Special Topics (3)
Lecture—1 hour; seminar—1 hour; discussion—1 hour. Prerequisite: graduate standing or course 129. Undergraduates with upper division standing with at least one writing course may enroll with consent of instructor. A continuation of course 293A, with additional special topics. May be repeated for credit up to 3 times with consent of instructor.

294A. Current Topics in Developmental Nutrition (2)
Seminar—2 hours. Prerequisite: course 114 or 252 or consent of instructor. Effects of nutrition on embryology, morphogenesis, and developmental mechanisms. May be repeated for credit when topic differs.—II.
Nutritional Biology (A Graduate Group)

Sheri Zidenberg-Cherr, Ph.D., Chairperson of the Group
Graduate Group Office. 1249 Meyer Hall
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C. Christopher Carr, Ph. D., Professor (Animal Science)
Andrew J. Clifford, Ph.D., Professor (Nutrition)
Douglas E. Conklin, Ph.D., Associate Professor (Animal Science)
Edward J. DePeters, Ph.D., Professor (Animal Science)
Kathryn G. Dewey, Ph.D., Professor (Nutrition)
Kent L. Erickson, Ph.D., Professor (Cell Biology and Human Anatomy)
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Sheri A. Zidenberg-Cherr, Ph.D., Specialist in Cooperative Extension (Nutrition)
Susan Zunino, Ph.D., Associate Adjunct Professor (Nutrition)

Graduate Study. The Graduate Group in Nutritional Biology offers programs of study and research leading to the M.S. and Ph.D. degrees. The great diversity of research interests represented by the faculty members allows students to choose from a wide variety of themes: nutritional biochemistry, animal nutrition and development, nutrient bioavailability, human/clinical nutrition, nutrition and behavior, nutritional energetics, community nutrition, community health, maternal and child nutrition, nutrition and endocrinology, international nutrition, obesity/body composition, physiology of digestion, nutrition and chronic disease, culture and nutrition, nutrition and gene expression, nutrition and aging, food preferences, nutrition and immunity, diet and exercise, dietary assessment, protein and lipid metabolism, food intake regulation, nutrition education.

Graduate Advisers. Consult the Nutritional Biology Graduate Group office.

Courses in Nutritional Biology (NUB)
Graduate
210A. Advanced Nutrition I: Nutrition and Metabolism, Macronutrients (5)
Lecture—4 hours; discussion—1 hour. Prerequisite: admission to the Nutritional Biology Graduate Group or consent of instructor. Class size limited to 30 students. Advanced general nutrition, concepts of macronutrition. Integrating nutrition with biological systems, population nutrition issues, and research approaches. Advanced concepts in lipid and protein metabolism. —I, (I)

210C. Advanced Nutrition III: Nutrition in Health and Disease (5)
Lecture—4 hours; discussion—1 hour. Prerequisite: admission to the Nutritional Biology Graduate Group or consent of instructor. Class size limited to 30 students. Integration of biochemical, physiological, and genetic aspects of nutrition in the context of clinical and epidemiological observations related to health and disease, including obesity and diabetes, cancer, vascular and neurodegenerative diseases, osteoporosis, and birth defects. Review and consideration of governmental. —II, (II)

290C. Research Group Conference (1)
Discussion—1 hour. Prerequisite: graduate standing. Weekly conference on research problems, progress and techniques in animal sciences. May be repeated for credit. (S/U grading only)—I, II, III, (I, II, III)

298. Directed Group Study (1-5)
Prerequisite: graduate standing in Nutritional Biology Graduate Group, or consent of instructor. May be repeated three times for credit when topics differ and consent of instructor. —I, II, III, (I, II, III)

299. Research (1-12)
Prerequisite: consent of instructor. May be repeated for credit. (S/U grading only)—I, II, III, (I, II, III)