

## DIVISION OF NUTRITIONAL SCIENCES

### ADMINISTRATION

Patrick Stover, director

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Robert Parker, associate director of undergraduate studies

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### THE DIVISION

Nutritional science draws upon the chemical, biological, and social sciences to understand the complex relationships between human health, nutritional status, food and lifestyle patterns, and social and institutional environments. Understanding these relationships includes the study of the metabolic regulation and function of nutrients, nutrient requirements throughout the life span, the role of diet in reducing risk of chronic disease, the nutritional quality of foods, and interventions and policies designed to promote the nutritional health of individuals, communities, and populations.

The focus of this broad field of study at Cornell is the Division of Nutritional Sciences, which brings together specialists from many disciplines. Faculty members are involved in undergraduate and graduate teaching, research, and extension of research-based knowledge throughout New York State, the nation, and the world.

The division is affiliated with both the College of Human Ecology and the College of Agriculture and Life Sciences. The undergraduate program in Nutritional Sciences is offered to students enrolled in both colleges. The undergraduate program in Human Biology, Health, and Society is offered through the College of Human Ecology. A program of study in nutrition for biological science majors is offered in collaboration with the undergraduate program in biology. Graduate study in the field of nutrition is administered by faculty members throughout the university.

### FACILITIES

Most of the faculty members of the division work in Savage Hall, Kinzelberg Hall, and Martha Van Rensselaer (MVR) Hall. In addition to housing offices, classrooms, and seminar rooms, these buildings contain research facilities, specialized laboratories, a human metabolic research unit, and computer facilities. Savage Hall has a graduate reading room and undergraduate student room.

### UNDERGRADUATE PROGRAMS

The Division of Nutritional Sciences (DNS) offers three programs leading to a B.S. degree:

**Nutritional Sciences (NS-CHE)**, College of Human Ecology: this program provides students with a strong foundation in the broad field of nutritional sciences as well as thorough training in chemistry and biology. Students may prepare for a variety of career interests, including medicine and other health careers, fitness and sports nutrition, nutrition counseling, clinical nutrition, dietetics, nutritional biochemistry, community nutrition, and nutrition education.

**Nutritional Sciences (NS-CALS)**, College of Agriculture and Life Sciences: this program is for students who want strong training in human nutrition combined with supportive course work in agriculture and the life sciences. Strong preparation in biology, chemistry, and math is required. Students in the NS-CALS program supplement the nutrition curriculum with courses in areas such as food science, animal science, plant science, advanced biology, business and economics, education, and communication.

**Human Biology, Health, and Society (HBHS)**, College of Human Ecology: established in 1997, this program gives students a strong foundation in biology. It then goes on to explore human health issues from the perspectives of both biology and the social sciences. Students complete a rigorous curriculum in the natural sciences and then, choosing from a wide array of courses offered in the College of Human Ecology, focus their studies on health issues of their choice. Students can explore such topics as gene expression and metabolism related to disease states, biological and social aspects of growth and development, and policies and programs influencing health.

The division also offers the **Program of Study in Human Nutrition for biological sciences majors** who may be enrolled in the College of Agriculture and Life Sciences or College of Arts and Sciences. The Program of Study in Human Nutrition offers biology majors courses on the nature and biochemical function of essential and nonessential nutrients, nutrient requirements, the role of nutrients in gene expression, and the role of diet in both risk of chronic disease and treatment of existing disease states. Students in this program of study are encouraged to complete a diverse set of advanced courses that afford a perspective on current knowledge of nutrient requirements and function and how this knowledge can be put to use. With the exception of a core course in the structure and function of nutrients, the course requirements are unspecified.

Faculty advisors work with individual students to develop a curriculum that fits the students' interests. As part of their program, students are encouraged to obtain laboratory experience either through course work or research. Students completing the program in nutrition most often choose to continue their

education in medical or graduate school and pursue careers in the applied aspects of nutrition or in laboratory-based or epidemiological research.

### THE CURRICULUM

Undergraduate students in these programs complete the requirements of their colleges as well as the courses required by the program of their specific interest.

Both the NS and HBHS programs require a rigorous sequence of courses in chemistry and biology, including introductory chemistry and biology, organic chemistry, biochemistry, and physiology. A minimum competency in college algebra is required with an additional math and/or statistics requirement for some programs and career paths. Students in the HBHS major also complete a course in physics and two additional courses in advanced biology.

All students complete the introductory course NS 1150 Nutrition, Health, and Society. The NS program requires the completion of four other core courses: NS 2450 Social Science Perspectives on Food and Nutrition; NS 3450 Nutritional and Physicochemical Aspects of Foods; NS 3310 Physiological and Biochemical Bases of Nutrition; and NS 3320 Methods in Nutritional Sciences. Students in these programs also must select a minimum of 9 credits in advanced courses in the nutritional sciences.

The HBHS major requires 15 credits of advanced electives that explore health issues from primarily a biological or a social perspective. These courses are offered by faculty in several departments within the College of Human Ecology.

Undergraduate students in these programs have a faculty advisor with whom they meet at least twice a year. Advisors help students plan their course schedules and can suggest opportunities for individual study or experience outside the classroom.

In both undergraduate programs the correct sequencing of biology, chemistry, and/or nutrition courses is very important. Students considering these programs should obtain detailed information about course requirements from the division's Academic Affairs office, B21 Savage Hall. This office offers a wide range of advising materials to help students develop a program of study that matches their interests and needs.

### CAREER OPTIONS AND COURSE PLANNING

Requirements for the programs are the minimum set of courses necessary for a bachelor's degree in these fields. Students should supplement their requirements with elective courses and other learning experiences that will prepare them for entry-

level jobs or advanced study in their field(s) of interest. A summary of suggested electives for different career interests follows:

#### **Medicine and Other Health Careers:**

Recommended courses for pre-med students include calculus and two semesters of physics. Specific information about medical school admissions requirements can be obtained from the university's Health Careers office, 203 Barnes Hall. Students interested in other health careers should acquire specific information about those requirements. Courses of interest may include those related to the biological and social determinants of health; human growth, development, and behavior through the life course; interpersonal communications; advanced biology; sociology; psychology; and ethics.

**Dietetics:** Students who wish to work in the areas of clinical nutrition, nutrition counseling, sports nutrition, community nutrition, or food and nutrition management should complete the academic requirements for The American Dietetic Association (ADA). Courses in foods, nutrition and disease, microbiology, management, statistics, and nutritional care are added to the courses required for the nutrition programs. For more information about meeting ADA requirements, contact the DNS Academic Affairs office, B19 Savage Hall.

#### **Exercise, Nutrition, and Health**

**Promotion:** Students should complete a course in physiology and a course in anatomy after introductory biology. Students can complete the Applied Exercise Science Concentration at Ithaca College, which includes courses in kinesiology, exercise physiology, and biomechanics. Students who wish to apply to graduate schools to study physical therapy should complete a year of introductory physics, a course in statistics, a course in ethics, and three courses in psychology. Students should check the specific requirements of their schools of interest. For information about the Applied Exercise Science Concentration, contact the DNS Academic Affairs office, B21 Savage Hall.

#### **Biomedical Research/Nutritional**

**Biochemistry:** Recommended electives include calculus, physics, genetics, advanced biology and chemistry, toxicology, and nutritional sciences courses related to the physiology, biochemistry, and metabolism of different nutrients and disease states.

#### **Public Health and Community Nutrition:**

Suggested electives include courses in communications, education, human development, policy analysis and management, maternal and child nutrition, geriatric nutrition, nutrition and disease, and food economics.

#### **Nutrition, Food, and Business:**

Recommended electives include courses in management, marketing, economics, communications, hotel administration, and food science.

**Nutrition and Agriculture:** Recommended electives include courses in food science, animal science, plant sciences, international agriculture, agricultural economics, biological sciences, and development sociology.

**International Nutrition:** Recommended electives include courses in language, anthropology, agricultural economics, policy, economics, development sociology, international agriculture, and nutritional

sciences related to maternal and child health and problems of developing nations.

**Biology and Behavior:** Recommended electives include courses in psychology, human development, and neurobiology.

#### **Food, Nutrition, and Health Policy:**

Recommended electives include courses in economics, sociology, government, policy analysis, and management.

## SPECIAL EXPERIENCES

Undergraduates can enhance their experiences by participating in structured field experiences or study abroad. Academic credit can be earned for field experiences in a community agency, health care facility, or business. The Urban Semester in the College of Human Ecology provides students with an opportunity to study and gain field experience in New York City. All students intending to spend a semester off-campus in field experience or study abroad must plan their courses well in advance to be sure that all program requirements can be met.

## INDEPENDENT STUDY ELECTIVES

Independent study courses (NS 4000, 4010, 4020) can be used to obtain credit for more diverse or intensive experience than the classroom can offer, whether this involves laboratory work, library research, or field study. Any student interested in independent study should obtain the sponsorship of a faculty advisor and the approval of the director of undergraduate studies or consider applying to the honors program.

## HONORS PROGRAM

The honors program, which leads to a B.S. degree with honors in the College of Human Ecology or a B.S. degree with distinction in research in the College of Agriculture and Life Sciences, gives official recognition to students who have demonstrated excellence in their academic work and their capacity for independent study.

In addition to fulfilling the requirements for a major, students in the honors program take seminars in designing and evaluating research (NS 3980), complete an original piece of research (at least 6 credits of NS 4990), and prepare an honors thesis. The honors project may be laboratory or field research or deal with policy and program development. For more information, students should contact Professor J. Thomas Brenna, B38 Savage Hall, or Professor Carole Bisogni, 328 MVR.

## COURSES RECOMMENDED FOR NONMAJORS

Courses in nutritional sciences can strengthen programs of study in biological sciences, biology and society, communications, food science, human development, human services, and other fields.

NS 1150 Nutrition, Health, and Society is open to all students. After NS 1150, nonmajors with limited backgrounds in chemistry and biology

may elect NS 2450 Social Science Perspectives on Food and Nutrition; NS 2470 Food for Contemporary Living; NS 2750 Human Biology and Evolution; NS 3060 Nutritional Problems of Developing Nations; NS 3150 Obesity and the Regulation of Body Weight; NS 3470 Human Growth and Development: Biological and Behavioral Interactions; NS 4500 Public Health Nutrition. Nonmajors with strong backgrounds in chemistry and the biological sciences may consider NS 3310 Physiological and Biochemical Bases of Human Nutrition, as well as many advanced nutritional sciences courses, such as NS 3450 Nutritional and Physicochemical Aspects of Foods; NS 4310 Mineral Nutrition and Chronic Disease; and NS 4410 Nutrition and Disease.

## GRADUATE PROGRAMS

Graduate study is administered by the field of nutrition, a group of about 40 faculty members from throughout the university who have a common interest in nutritional problems. In the M.S. and Ph.D. degree programs, students may specialize in molecular and biochemical nutrition, human or animal nutrition, community nutrition, or international nutrition. Research is emphasized in all graduate programs. Field experience may be an important component of concentrations in community, international, and public health nutrition and nutrition education. Teaching experience and participation in the graduate student seminar (NS 7030) are important aspects of graduate training.

The specialties and interests represented by faculty in the field of nutrition provide almost unlimited opportunity for graduate study. Cornell's extensive laboratory and agricultural facilities ensure that students interested in experimental nutrition have exceptional choices and thorough training. As the largest faculty in the country devoted to the study of human nutrition, the field includes specialists in biochemical, metabolic, epidemiological, and sociocultural research. Opportunities to work with community and federal agencies are available to students interested in applied nutrition and public policy. Students in international nutrition are expected to conduct their thesis research abroad.

For more information about the graduate program, students should visit the web site or contact the director of graduate studies, field of nutrition, Cornell University, B19 Savage Hall, Ithaca, NY 14853-4401, 255-2628, [nutrition\\_gfr@cornell.edu](mailto:nutrition_gfr@cornell.edu), or [www.nutrition.cornell.edu/grad.html](http://www.nutrition.cornell.edu/grad.html).

## COURSES

### **NS 1150 Nutrition, Health, and Society**

Fall. 3 credits. S-U or letter grades.  
D. Levitsky.

Discusses the facts and fallacies concerning the role that nutrition, exercise, and other health behaviors play in preventing disease, maintaining good health, and maximizing athletic performance. Emphasis is on understanding the biological mechanisms through which good nutrition and regular exercise affect psychological and physical health.

**NS 1160 Personalized Concepts and Controversies**

Fall. 1 credit. Limited enrollment.  
Prerequisite: freshman or transfer standing.  
Corequisite: NS 1150. S-U grades only.  
J. Swanson.

Provides students enrolled in NS 1150 individualized assistance in many skills including using computers to analyze diets, finding and using scientific references, understanding and criticizing scientific articles, and reviewing material presented in lectures.

**NS 1200 Nutrition and Health: Issues, Outlooks, and Opportunities**

Spring. 1 credit. Prerequisite: freshman, sophomore, or junior standing or permission of instructor. *Not* an introductory nutrition course for nonmajors. S-U grades only. C. You.

For students interested in exploring careers in the broad fields of food, nutrition, and health. Experts representing different areas discuss their work, focusing on current issues and trends as well as the requisite knowledge and skills. This course introduces many of the disciplines that are drawn upon in addressing human problems related to food, diet, and health. Students explore career opportunities through a variety of assignments.

**NS 1220 Nutrition and the Life Cycle**

Spring. 3 credits. Prerequisite: one semester college biology or NS 1150. Letter grades only. P. Brannon.

Biology of the life cycle including development, growth, maturation and aging and its impact on nutritional requirements of humans from the zygote to the elderly is considered. How to meet these nutritional requirements is discussed relative to the feeding issues and context of each major life stage. Course emphasizes the critical analyses of beneficial and adverse outcomes of various nutrient intakes and dietary patterns on the nutritional status and well-being through integration of nutrition and other health sciences in understanding nutritional needs during the life cycle.

**NS 2450 Social Science Perspectives on Food and Nutrition**

Fall. 3 credits. Limited enrollment.  
Prerequisite: NS 1150. S-U or letter grades.  
C. Bisogni and J. Sobal.

Uses theories, concepts, and methods from the social sciences to examine food, eating, and nutrition. The food choice process model is used as a framework for examining the scope of social science aspects of nutrition. Assignments include examinations and two research projects, one qualitative and one quantitative, for which students prepare proposals, collect and interpret data, and write papers to report data.

**NS 2470 Food for Contemporary Living**

Fall and spring. 2 credits. Limited enrollment. Priority given to Dietetics students. Highly recommended: NS 1150. Students must attend first lab or placement is forfeited. S-U or letter grades. Lab coat required. E. Gier.

During this laboratory course, the understanding of food ingredients and techniques of food preparation is applied to positive nutritional practices and health promotion goals; basic food science and nutrition principles, food safety/sanitation, sensory evaluation, and social-cultural influences on food choices; food preparation, recipe modification, sensory evaluation (taste testing required); basic cooking skills,

techniques. Introduction to basic menu planning and meeting nutritional requirements while restricted to a budget. Lab performance and a lab practical factored into final student evaluation; attendance at all labs is expected.

**NS 2600 Introduction to Global Health (also BSOC 2601)**

Spring. 3 credits. Limited enrollment. Letter grades only. J. Moseley.

Explore contemporary issues, problems, and controversies in global health through an interdisciplinary perspective. Introduces the global burden of disease and then examines complex social, economic, political, environmental, and biological factors that structure the origins, consequences, and possible treatments of global health problems. A limited number of problems are explored in depth (e.g., HIV, maternal mortality, malaria).

**NS 2750 Human Biology and Evolution (also ANTHR 2750)**

Fall. 3 credits. Prerequisite: college biology. S-U or letter grades. J. D. Haas and Z. Gu.

Examines the theories and mechanisms of modern evolutionary biology as they apply to present-day humans and their hominin ancestors. Includes lectures and discussions of molecular and paleontological evidence of human evolution, the causes and consequences of contemporary human biological diversity, and biological and behavioral modes of human adaptation to past and present natural and cultural environments.

**NS 3000 Special Studies for Undergraduates**

Fall or spring. Prerequisite: permission of instructor. S-U or letter grades. DNS faculty. Special arrangements can be made to establish equivalency for courses not transferred from a previous major or institution. Students prepare a description of the study they want to undertake using a form available from the college registrar's office. The form, signed by both the instructor directing the study and the associate director for academic affairs, is filed at course registration or during the change-of-registration period.

**[NS 3060 Nutritional Problems of Developing Nations**

Fall. 3 credits. Prerequisite: NS 1150. S-U or letter grades. Offered alternate years; next offered 2009–2010. R. Stoltzfus.

Overview of the most important nutrition problems facing developing countries today and an in-depth understanding of the nutrition problems of one country, chosen as a case study for the course. Course uses the health/care/food framework to analyze the causes of these nutrition problems. Instruction is through lectures and readings. Evaluation is through individual assignments, a group project, and exams.]

**[NS 3150 Obesity and the Regulation of Body Weight (also PSYCH 3150)**

Spring. 3 credits. Prerequisites: junior or senior standing; NS 1150, PSYCH 1101. S-U or letter grades. Offered alternate years; next offered 2009–2010. D. Levitsky.

Multidisciplinary discussion of the causes, effects, and treatments of human obesity. Topics include the biopsychology of eating behavior, the genetics of obesity, the role of activity and energy metabolism, the psychosocial determinants of obesity, anorexia nervosa, therapy and its effectiveness, and social discrimination.]

**[NS 3200 Introduction to Human Biochemistry**

Fall. 4 credits. Prerequisites: one year college biology; one year college general chemistry; and CHEM 1570 or 3570–3580; or permission of instructor. S-U or letter grades. Next offered 2009–2010. P. Stover.

Presents the principles of biochemistry within the context of human health and disease. Teaches the metabolism of carbohydrates, lipids, proteins, and selected micronutrients from a perspective that emphasizes their role in supporting the structure and physiological functions of the major organs of the body. Incorporates the concepts of enzyme catalysis, enzyme regulation, hormone action, and bioenergetics within this framework. Covers the fundamental concepts of eukaryotic DNA structure, function, and gene expression with reference to their importance in regulating metabolism and the impact of a changing nutrient environment.]

**NS 3220 Maternal and Child Nutrition**

Spring. 3 credits. Limited enrollment.  
Prerequisite: NS 1220. S-U or letter grades.  
Offered alternate years. P. Brannon.

Advanced aspects of the biological bases of nutritional requirements for reproduction, growth, and development; in-depth critical analyses of the impact of nutritional status on the mother, fetus and young child; and integration of nutrition with life and behavioral sciences in understanding these aspects are addressed. Health disparities, obesity, and malnutrition are considered from global and domestic perspectives.

**NS 3310 Physiological and Biochemical Bases of Human Nutrition**

Spring. 4 credits. Prerequisites: BIOBM 3300 or 3310, or NS 3200, or equivalent. S-U or letter grades. C. McCormick and L. Qi.

Examines the biochemical and physiological bases of human nutritional requirements. Uses an integrated approach to cover the digestion and metabolism of nutrients (carbohydrates, proteins, lipids, vitamins, and minerals). Metabolic and chronic diseases related to nutrition are discussed throughout the semester. Discussion sections and problem sets provide an opportunity to examine in greater depth selected topics from lecture.

**NS 3320 Methods in Nutritional Sciences**

Fall. 3 credits. Prerequisites: undergraduate biochemistry; NS 3450, NS 3310 preferred or concurrent registration. Letter grades only. M. N. Kazarinoff.

Laboratory introduction to principles and analytical techniques of nutritional research. Emphasizes analytical concepts and skills required to determine nutrient function and nutritional status of individuals. Topics include methods of nutrient, metabolite, and enzyme analysis in body fluids; methods for assessing individual food intake and nutritional status; and methods for assessing the composition of foods.

**NS 3410 Human Anatomy and Physiology**

Spring. 4 credits. Prerequisite: college biology; **limited to DNS majors; must be NS, NS-CALS, or HBHS major.**

Recommended: NS 1150. **Students must attend first lec and lab or placement is forfeited.** For further information, go to B21 Savage Hall. Letter grades only. K. O'Brien and J. Swanson.

Introduces human anatomy and physiology with particular emphasis on aspects of relevance to the nutritional sciences and



medicine. Covers all major organ systems. Laboratories emphasize location, recognition, and description of anatomical structures. Testing of physiological functions focuses on tests with nutritional and medical relevance.

**NS 3450 Introduction to Physicochemical and Biological Aspects of Foods (also FDSC 2000)**

Fall. 3 credits. Prerequisites: college-level courses in chemistry and biology. Letter grades only. R. Parker and J. Hotchkiss. For description, see FDSC 2000.

**NS 3470 Human Growth and Development: Biological and Behavioral Interactions (also HD/BSOC 3470)**

Spring. 3 credits. Prerequisites: BIO G 1101 or 1109 or equivalent; HD 1150 or PSYCH 1101 or equivalent. S-U or letter grades. Offered alternate years. J. Haas and S. Robertson.

Discusses the interrelationships of physical and psychological growth and development in humans during infancy. Considers intrinsic and extrinsic causes of variations in growth including various forms of stimulation. Examines the consequences of early growth and its variations for current and subsequent behavioral, psychological, and physical development. The interaction between physical and behavioral or psychological factors is emphasized throughout the course.

**NS 3980 Research in Human Nutrition and Health**

Fall. 1 credit. Requirement for students in honors research program sponsored by DNS. Open to all students. S-U grades only. J. T. Brenna and C. Bisogni. Lecture course focusing on the structures and practice of professional research conducted in human nutrition and health, a field that encompasses questions ranging widely from subcellular components to population-level issues. Introduces the various approaches and methods used by researchers and addresses the topics of ethics and research controls. Describes the structure of scientific literature, preparation of research proposals, roles of scientific organizations, and funding sources. Students are required to attend and report on research seminars on campus.

**NS 4000-4010-4020-4030 Special Studies for Undergraduates**

Fall or spring. Variable to 3 credits. S-U grades only for NS 4000-4010-4020. S-U or letter grades for NS 4030. DNS faculty. For advanced independent study by an individual or group of students who want to study a field of nutritional sciences not otherwise provided through course work in the division or elsewhere in the university. Students prepare a description of the study they want to undertake on a form to be signed by the instructor directing the study and the director of undergraduate studies. The form, available in B21 Savage Hall, is filed at course registration or within the change-of-registration period along with an add/drop slip in the Human Ecology registrar's office. To ensure review before the close of the course registration or change-of-registration period, students should submit the special-studies form to B21 Savage Hall as early as possible.

**NS 4000 Directed Readings**

S-U grades only. Study that predominantly involves library research and independent reading.

**NS 4010 Empirical Research**

S-U grades only. Study that predominantly involves data collection and analysis or laboratory or studio projects.

**NS 4020 Supervised Fieldwork**

S-U grades only. Study that involves both responsible participation in a community setting and reflection on that experience through discussion, reading, and writing. Academic credit is awarded for this integration of theory and practice.

**NS 4030 Teaching Apprenticeship**

S-U or letter grades. Study that includes assisting faculty with instruction.

**NS 4210 Nutrition and Exercise**

Spring. 3 credits. Limited enrollment. Prerequisites: NS 1150 and BIOAP 3110. Pre- or corequisite: BIOBM 3300, 3310, or 3330. S-U or letter grades. S. Travis. Examines the interaction between nutrition, exercise, and athletic performance. Topics include the biological, psychological, and sociological aspects of nutrition as it relates to exercise performance. Lectures cover current research on nutritional needs in response to exercise, including fluids, energy nutrient requirements and caloric distribution, supplementation, ergogenic aids, pre-/post-event recommendations. Applications to various sports. Critical thinking skills are enhanced by critiques of studies on sports nutrition-related topics and the evaluation of popular sports nutrition claims. Learn educational strategies for communicating with the recreational and professional athlete, coach, and trainer.

**NS 4250 Nutrition Communications and Counseling**

Spring. 3 credits. Limited enrollment. Prerequisites: NS 1150, 1220, and 2450; junior or senior standing; priority given to dietetics/nutrition majors. Letter grades only. S. Travis.

Students learn the theoretical basis of effective health promotion communications and develop effective nutrition communication skills through application in a variety of settings. Provides hands-on experiences in counseling, educational program development, and oral and written communications.

**NS 4310 Mineral Nutrition and Chronic Disease**

Fall. 3 credits. NS 3310 preferred. S-U or letter grades. C. McCormick. Evaluate the evidence from primary literature that dietary calcium, sodium, and iron play an important role in the development of osteoporosis, hypertension, and anemia, respectively. An additional goal of the course is to review the molecular processes that are involved in the homeostasis of each mineral and the recommendations for daily nutrient intakes. Class discussion of key research articles is conducted and evaluated.

**NS 4410 Nutrition and Disease**

Fall, spring. 4 credits. Prerequisites: NS 3310 and physiology course. S-U or letter grades. Fall, V. Utermohlen; spring, M. Caudill.

Studies the anatomical, physiological, and metabolic abnormalities in acute and chronic illness and the role of nutritional therapy in their prevention and care. Topics include nutritional assessment, nutritional pharmacology, starvation, infection, trauma, cancer, diabetes mellitus, and renal, cardiovascular, pulmonary, skeletal, neurological, liver, and gastrointestinal disorders.

**NS 4420 Implementation of Nutrition Care**

Fall. 3 credits. Pre- or corequisites: NS 1150, NS 1220, NS 2470, NS 4410, or concurrent registration or equivalent background in courses. S-U or letter grades. Evening prelim. E. Gier. Develop skills necessary to implement nutrition care. Application of the nutrition care process as it applies to clinical settings is emphasized. Students develop skills to perform nutrition assessment, nutrition diagnosis, nutrition intervention, monitoring, and evaluation. Content includes principles of MNT for acute and chronic diseases, menu planning for disease states, the role of other allied health practitioners in assuring nutritional health, and reimbursement and legislation in dietetics practice. Students have the opportunity to perform basic nutrition assessment skills in a local clinic and/or long-term care setting.

**NS 4450 Toward a Sustainable Global Food System: Food Policy for Developing Countries (also AEM 4450)**

Fall. 3 credits. Preferred: 6 credits in economics, applied economics, or sociology and 6 credits in nutrition and/or agricultural sciences. Letter grades only. P. Pinstrup-Andersen. Comprehensive presentation and discussion of policy options for a sustainable global food system, with focus on developing countries. Topics include economic policy related to nutrition, health, consumption, production, natural resource management, trade, markets, gender roles, armed conflict, and ethics. A social entrepreneurship approach bases on case studies and active participation by students will be used.

**NS 4500 Public Health Nutrition**

Spring. 3 credits. Prerequisite: NS 1150. Students must enroll in a policy lab. Students must attend first lec and lab or placement is forfeited. K. Rasmussen. Public health nutrition is the major professional career track for nutritionists outside of dietetics. It deals with efforts to improve the diets and nutritional status of whole populations by working at the community, state, and national levels. Course helps prepare students to work in public health nutrition by describing methods used in the assessment of nutrition problems, the development of nutrition-related policies, and the delivery of health, nutrition, and food assistance programs.

**[NS 4570 Health, Poverty, and Inequality: A Global Perspective**

Spring. 3 credits. Prerequisite: introductory microeconomics and statistics or permission of instructor. S-U or letter grades. Offered alternate years; next offered 2009-2010. D. Sahn. Course focuses on global health challenges, and how they are related to poverty and inequality.]

**[NS 4750 Mechanisms Underlying Mammalian Developmental Defects (also BIOAP 4750)]**

Spring. 3 credits. Prerequisites: BIOBM 3300, 3310–3320 or 3330 (may be taken concurrently). Offered alternate years; next offered 2009–2010. D. Noden and P. Stover. Developmental defects are present in nearly 5 percent of humans. Drawing upon current research, this course explores the causes of birth defects, emphasizing the interplay between genetic and environmental factors in the regulation of developmental processes. Emphasis is on nutritional disruptors, teratogens, and regulatory gene networks that are well characterized through animal studies and are associated with morphological, physiological, reproductive, or behavioral abnormalities in humans.]

**NS 4880 Applied Dietetics in Food Service Systems**

Spring. 3 credits. Limited to Dietetics seniors. Prerequisites: HADM 1106 or intro food service management course, NS 2470, and BIOMI 2900. White lab coat required. Fee for special supplies/training and activities: approx. \$100. E. Gier. Gain experience in facility design; equipment selection, use, and care; job analysis and evaluation; human resources planning; management of financial resources; recipe development and volume food production; computer-assisted management; employee training; and applied safety and sanitation standards. Through planning and executing a themed event, students develop other skills required to operate/manage a food service program. Application of quality management in food service operations and facility management is stressed. Laboratories are arranged through Cornell Dining and other off-campus sites. Completion of a professional portfolio is required. ServSafe training and examination is conducted; successful completion results in ServSafe certification.

**NS 4900 Manipulating the Mouse Genome (also BIOGD 4900)**

Fall. 1 credit. Meets during first half of semester and provides background information in VTBMS/TOX 7010 Mouse Pathology and Transgenesis, which meets during second half. Students interested in both must register for them separately. Prerequisites: BIOGD 2800, 2810, or 2820 and BIOBM 3300, 3320 or 3330, or NS 3200. S-U or letter grades. P. Soloway. Functional genomic analysis has benefited enormously from experimental manipulation of the genomes of many organisms. The mouse has been the model of choice for such studies in mammals. Explores the tools available for experimental manipulation of the mouse genome, including transgenesis, gene targeting, gene trapping, chemical mutagenesis, and cloning by nuclear transplant. Also discussed are use of recombinant inbred mice for complex trait analysis. Readings from the scientific literature focus on seminal applications of these methods.

**NS 4990 Honors Problem**

Fall and spring. Credit TBA. Prerequisite: acceptance into honors research program. Students who have been accepted into the honors research program work on their projects under the guidance of their faculty mentors. Honors research students must complete a minimum of 6 credits of NS 4990, typically spread over two or more semesters. The student and the mentor determine the appropriate number of credits for each semester. Research activities may include reviewing the literature, writing a proposal, developing research methods, collecting data in the field or laboratory, analyzing data, and writing the honors thesis.

**NS 6000 Special Problems for Graduate Students**

Fall or spring. Credit TBA. Prerequisite: graduate students recommended by their chair and approved by instructor in charge. S-U or letter grades. DNS faculty. Emphasizes independent advanced work. Experience in research laboratories in the division may be arranged.

**NS 6030 Mineral Nutrition: Metabolic, Health, and Environmental Aspects (also ANSC 6030)**

Fall. 2 credits. Prerequisites: biochemistry, physiology, and nutrition courses. Letter grades only. Offered alternate years. X. G. Lei and C. C. McCormick. For description, see ANSC 6030.

**NS 6050 Nutritional Biochemistry Colloquium**

Fall and spring. 1 credit. S-U grades only. Nutritional biochemistry faculty. Graduate seminar series that focuses on recent advances in biochemical nutrition. Weekly presentations are made by faculty members, postdocs, and graduate students and are based on the primary literature. The presentations are followed by a discussion involving all participants.

**NS 6080 Epigenetics (also BIOGD 6080)**

Fall. 2 credits. Prerequisites: BIOGD 2810 and BIOBM 3300, 3320, or 3330 or NS 3200. Letter grades only. P. Soloway. Epigenetic effects refer to reversible alterations in chromatin structure that can stably and heritably influence gene expression. Changes include covalent modifications to DNA itself or to proteins bound to DNA as well as noncovalent remodeling of chromatin. Course examines selected epigenetic phenomena described in several eukaryotes, mechanisms regulating these effects, and their phenotypic consequences when normal regulation is lost. Reading materials are from current literature, and participation in class discussion is required.

**NS 6100 Proteins and Amino Acids: Nutritional Regulation of Mammalian Protein Synthesis and Degradation**

Fall. 2 credits. Prerequisites: undergraduate chemistry and biology including biochemistry; for undergraduates, permission of instructor. Recommended: cell biology. Letter grades only. Offered alternate years. M. Stipanuk. Basic biochemistry and cell biology related to processes involved in protein synthesis and degradation and the regulation of these processes. Scientific literature will be used to provide examples of regulation of each of these processes, selected for their relevance to human nutrition and metabolism.

**NS 6110 Molecular Toxicology (also TOX 6110)**

Spring. 3 credits. Prerequisite: TOX 6100 or permission of instructor. S-U or letter grades. Offered alternate years. S. Bloom, R. Dietert, D. Muscarella, and B. Strupp. Focuses on the metabolism of drugs and environmental toxicants to reactive forms that can modify DNA and proteins and induce target organ toxicity as well as mutations and cancer. Also emphasizes factors and pathways that can modulate toxic effects, including polymorphic drug-metabolizing enzymes, stress-activated signal transduction, and DNA repair. Discusses the uses of molecular and cellular stress markers for assessment of toxicant exposure and health risks.

**NS 6140 Topics in Maternal and Child Nutrition**

Fall. 3 credits. Prerequisite: permission of instructor. Letter grades only. K. Rasmussen. Advanced course on the role of nutrition during pregnancy and lactation. The feeding and growth of infants and children in health and disease is considered. Critical evaluation of current literature is emphasized via lecture, discussions, and a term paper.

**NS 6170 Teaching Seminar**

Fall or spring. 0 credits. Prerequisite: DNS graduate students or permission of instructor. S-U grades only. C. You and D. Way. Individualized instruction focusing on development of teaching skills for guiding learning in lecture, discussion, and laboratory setting, and reflection on the impact of these skills on teaching and learning. Students identify the aspects of the specific teaching assignments they wish to develop and work with instructors on independent learning projects that may include preparation for lecturing, preparation of exams, efficient grading, and so on. Optional videotaping provides opportunities for practice and analysis.

**NS 6180 Teaching Experience**

Fall or spring. 0 credits. Prerequisite: DNS graduate students or permission of instructor. S-U grades only. C. You. Designed to provide experience in teaching nutritional sciences by direct involvement in college courses under supervision of a faculty member. The aspects of teaching and the degree of involvement vary, depending on the needs of the course and the experience of the student.

**NS 6190 Field of Nutrition Seminar (also ANSC 6190)**

Fall or spring. 0 credits. S-U grades only. Faculty and guest lecturers. Lectures on current research in nutrition.

**NS 6250 Community Nutrition in Action**

Fall. 3 credits. Prerequisite: dietetic interns. S. Travis. Provides students enrolled as dietetic interns with supervised, in-depth experiences in a community nutrition program and fosters the integration of research, theory, and practice. Through placements in community programs, students gain experience in program administration and in assessing, designing, implementing, and evaluating food and nutrition programs for targeted populations through public and private organizations. In weekly seminars (and other seminars and observations as arranged) students integrate theory and practice, reflect upon their placement experience, learn about community nutrition research, and explore the many

issues facing community food and nutrition practitioners.

**[NS 6300 Anthropometric Assessment]**

Spring, five weeks. 1 credit. Prerequisite: NS 3310 or equivalent and permission of instructor. S-U or letter grades. Offered alternate years; next offered 2009–2010. J. Haas.

Topics in this lecture/lab course include biological basis of anthropometry for nutritional status assessment, quality control of anthropometric data, applications to special groups (infants, children, adolescents, pregnant women, and the elderly), statistical analysis and presentation of anthropometric data, reference standards and interpretation, measurement techniques of anthropometry, and body composition assessment.]

**NS 6310 Micronutrients: Function, Homeostasis, and Assessment**

Fall. 2–4 credits. Prerequisites: intro biochemistry and NS 3310 (or equivalent) or permission of instructor. S-U or letter grades. C. McCormick, K. O'Brien, R. Parker, and P. Stover.

Advanced course in nutrition that focuses on the function, homeostasis, and metabolism of the principal dietary micronutrients (vitamins and minerals). It expands on the principles of nutritional biochemistry provided in introductory courses. One goal is to provide the scientific basis and rationale for recommended Dietary Reference Intakes. The course will draw on primary literature of both past and contemporary research. This course is divided into two parts: minerals and vitamins (each for 2 credits) during the first and second 7-week periods, respectively.

**NS 6320 Regulation of Macronutrient Metabolism**

Spring. 4 credits. Prerequisite: NS 3310 or permission of instructor. S-U or letter grades. M. Stipanuk and staff.

Course provides a comprehensive overview of macronutrient metabolism with an emphasis on issues relevant to human nutrition. Topics include regulation of macronutrient utilization by various tissues in response to food intake, energy stores, and energy expenditure; cellular pathways for integration of nutrient, growth, and stress signals; biological regulation of food intake and energy expenditure; the regulation of utilization of macronutrients for growth; dietary reference intakes for macronutrients; specialized functions of essential amino acids and essential fatty acids; lipoprotein and cholesterol metabolism; and the regulation, or dysregulation, of macronutrient utilization in various disease/physiological states.

**NS 6350 Introduction to Community Nutrition Research for Dietetic Interns**

Fall. 2 credits. Prerequisites: graduate standing and permission of instructor. Letter grades only. DNS faculty.

Introduces the paradigms, concepts, methods, and issues involved in community nutrition research. Students design and conduct individual research projects to inform community nutrition programs. Lectures, readings, and class discussion support students as they conduct their research activities.

**[NS 6370 Epidemiology of Nutrition]**

Spring. 3 credits. Prerequisites: graduate standing; BTRY 6010 and concurrent registration in BTRY 6020 or equivalent knowledge; basic knowledge of nutritional aspects of growth and development and nutritional biochemistry. S-U or letter grades. Next offered 2009–2010. DNS faculty.

Covers principles of nutritional epidemiology, impact assessment of nutrition intervention programs, and nutritional surveillance. Presents principles of using nutritional information in decision making. Shows how the biochemistry and physiology of nutrition can be related to epidemiological assessment and research strategies.]

**[NS 6380 Epidemiology of Nutrition Seminar]**

Spring. 3 credits. Prerequisites: graduate students planning field intervention studies; permission of instructor; NS 6370. Next offered 2009–2010.

Covers the meta-analysis, design, measurement, and analytic issues involved in developing, implementing, and analyzing studies of field interventions with nutritional impact.]

**NS 6400 Social Science Theories in Nutrition**

Fall. 3 credits. Limited enrollment. Prerequisite: graduate standing. J. Sobal.

Social science theories from sociology, psychology, anthropology, economics, political science, geography, and history that contribute to understanding food, eating, and nutrition are discussed to understand how paradigms, theories, and models apply to nutrition topics, issues, and problems.

**NS 6420 Globalization, Food Security, and Nutrition (also AEM 6420)**

Fall. 2 credits. Prerequisites: permission of instructor, graduate standing, and basic understanding of economics and nutrition. Letter grades only. P. Pinstrup-Andersen.

Directed readings course with a weekly 50-minute discussion session. Course is aimed at graduate students in nutrition, agricultural economics, and other relevant fields, who wish to explore how globalization may affect poverty, food security, and nutrition in developing countries and how national policies and international agreements and institutions may influence the outcome. Discussion sessions are based on assigned readings for each week.

**NS 6440 Community Nutrition Seminar**

Fall and spring. 1 credit. S-U grades only. A. Gillespie.

Sponsored by the Cornell Community Nutrition Program. Graduate students and faculty learn about current research in the program and related fields within and outside Cornell and about community nutrition theories and research methodologies. The seminar also provides a forum to discuss participants' own research and current issues in community nutrition.

**[NS 6500 Assessing Food and Nutrition in a Social Context]**

**NS 6520 The Foundations of Epidemiology**

Spring. 3 credits. Prerequisite: BTRY 6010 or equivalent. Letter grades only. P. A. Cassano.

This course is designed to train students to conduct epidemiologic research of the highest quality. Through lectures and in-class discussion, students also will learn how to evaluate research conducted by others, and how to apply epidemiologic principles to study the role of nutrition in health, the outcomes of treatment in clinical medicine, and the evaluation of health services.

**NS 6600 Special Topics in Nutrition**

Fall or spring. 3 credits max. each semester; because topics change, may be repeated for credit. Prerequisite: graduate standing and permission of instructor. DNS faculty.

Designed for students who want to become informed in any specific topic related directly or indirectly to nutrition. The course may include individual tutorial study, experience in research laboratories, a lecture series on a special topic selected by a professor or a group of students, and/or selected lectures of another course already offered.

**[NS 6800 International Nutrition Problems, Policy, and Programs]**

Spring. 3 credits. Prerequisite: permission of instructor. TBA. Offered alternate years. International Nutrition faculty.

Designed for graduate students who want to learn about the important nutritional problems of developing countries. The major forms of malnutrition related to poverty and their underlying causes are discussed. Emphasis is placed on programs and policies that can help poor countries and communities improve their nutritional and health status.]

**NS 6850 Empirical Methods for the Analysis of Household Survey Data: Applications to Nutrition, Health, and Poverty (also ECON 7711)**

Spring. 3 credits. Prerequisites: intermediate microeconomics, intermediate statistics or econometrics (through multiple regression and limited dependent variable models), or permission of instructor. Offered alternate years. D. Sahn.

Focuses on empirical methods for the analysis of household survey data. Students examine a series of measurement and modeling issues focused on health and nutrition, education, and poverty. In addition, they explore methods to evaluate social programs. Course readings and data that are used for hands-on empirical exercises are largely from Africa and Asia.

**NS 6900 Trace Element and Isotopic Analysis (also CHEM 6280)**

Fall. 3 credits. Prerequisite: CHEM 2880 or 3900, 3020 or CHEM 2080 and MATH 1120, or permission of instructor. Primarily for graduate students and advanced undergraduates. S-U or letter grades. Offered alternate years. J. T. Brenna.

Survey course in modern high-precision isotope ratio mass spectrometry (IRMS) techniques and trace/surface methods of analysis. Topics include dual inlet and continuous flow IRMS, thermal ionization MS, inductively coupled plasma MS, atomic spectroscopy, ion and electron microscopies, X-ray and electron spectroscopies, and biological and solid state applications. The first five weeks focus on IRMS instrumentation



and are offered as a separate 1-credit special topics course (NS 6660).

**NS 6980 International Nutrition Seminar**  
Fall and spring, 0 credits. No grades given. Staff.

Consists of presentations by Cornell faculty and graduate students and invited outside speakers. Speakers cover a range of topics relating to nutritional problems, policy, and programs in nonindustrialized countries.

**NS 6990 Special Topics in International Nutrition**

Fall and spring, 3 credits max. each semester; because topics change, may be repeated for credit. Prerequisite: permission of instructor. International Nutrition faculty.

Designed for graduate students, mainly those with a concentration in international nutrition, who wish to become familiar with some specific topic related to international nutrition that is not adequately covered in an existing course. It consists of tutorial study on an agreed-upon topic.

**NS 7020 Seminar in Toxicology (also TOX 7020)**

Fall or spring, 1 credit. S-U grades only. Staff.

Covers varied topics in biochemical, genetic, nutritional, veterinary, and regulatory toxicology, ecotoxicology, and environmental chemistry. Includes presentations of basic research studies, fundamental concepts, and research activities involving environmental problems of a toxicological nature. Presentations are given by speakers from Cornell and visitors.

**NS 7030 Seminar in Nutritional Sciences**

Fall and spring, 1 credit. Prerequisite: for undergraduates, permission of instructor. S-U grades only. DNS faculty.

Presentations of original articles pertinent to the nutritional sciences. Students read and learn how to critically analyze and interpret original articles published in a wide variety of journals. Students learn how to make professional presentations and how to critique the presentations given by others.

**NS 7040 Grant Writing**

Spring, 2 credits. Prerequisite: NS 7030. S-U grades only. P. Stover.

Interactive course that addresses the knowledge, approach, and professional skills (conceptual, technical, and writing) required to create a successful grant proposal and initiate a career in research. Format is focused around the development, execution and evaluation of NIH-style grant proposals. Lectures will focus on the development of hypotheses, specific aims and long term goals, as well as research design and methodology. Issues of human subject and animal experimentation, ethics and research collaborators are also covered. Students are expected to develop a full-length grant proposal in consultation with their research advisor. Basic guidelines and approach to proposal evaluation and scoring are covered. Course concludes with a mock study section where all proposals are reviewed by the students.

**NS 8990 Master's Thesis and Research**

Fall or spring. Credit TBA. Prerequisite: permission of graduate committee chair and instructor. S-U or letter grades. DNS graduate faculty.

**NS 9990 Doctoral Thesis and Research**

Fall or spring. Credit TBA. Prerequisite: permission of graduate committee chair committee and instructor. S-U or letter grades. DNS graduate faculty.

## FACULTY ROSTER

Bensadoun, Andre, Ph.D., Cornell U. Prof., Nutritional Sciences/Physiology, Emeritus  
Bisogni, Carole, Ph.D., Cornell U. Prof.  
Brannon, Patsy, Ph.D., Cornell U. Prof.  
Brenna, J. Thomas, Ph.D., Cornell U. Prof.  
Campbell, T. Colin, Ph.D., Cornell U. Jacob Gould Schurman Emeritus Professor of Nutritional Biochemistry  
Cassano, Patricia, Ph.D., U. of Washington. Asst. Prof.  
Caudill, Marie, Ph.D., U. of Florida. Asst. Prof.  
Devine, Carol M., Ph.D., Cornell U. Assoc. Prof.  
Dollahite, Jamie, Ph.D., U. of Texas. Assoc. Prof. and EFNEP Leader  
Frongillo, Edward, Jr., Ph.D. Cornell U. Prof. and Chair, Dept. of Health Promotion, Education, and Behavior, U. of South Carolina.  
Gillespie, Ardyth, Ph.D., Iowa State U. Assoc. Prof.  
Gu, Zhenglong, Ph.D., U. of Chicago. Asst. Prof.  
Haas, Jere D., Ph.D., Pennsylvania State U. Nancy Schlegel Meining Professor in Maternal and Child Nutrition  
Habicht, Jean-Pierre, Ph.D., Massachusetts Inst. of Technology. James Jamison Professor of Nutritional Epidemiology, Emeritus  
Kazarinoff, Michael N., Ph.D., Cornell U. Assoc. Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology  
Latham, Michael, M.D., Harvard U. Prof. Emeritus, Nutritional Sciences  
Levitsky, David A., Ph.D., Rutgers U. Prof.  
McCormick, Charles, Ph.D., North Carolina State U. Assoc. Prof. and Dir., Undergraduate Studies  
O'Brien, Kimberly, Ph.D., U. Connecticut. Assoc. Prof.  
Olson, Christine M., Ph.D., U. of Wisconsin. Prof. and Dir., Graduate Studies  
Parker, Robert S., Ph.D., Oregon State U. Assoc. Prof. and Assoc. Dir., Undergraduate Studies  
Pearson, Thomas, Ph.D., Johns Hopkins U. Adjunct Prof.  
Pelletier, David, Ph.D., Pennsylvania State U. Assoc. Prof.  
Pelto, Gretel, Ph.D., U. of Minnesota. Prof.  
Pinstrup-Andersen, Per, Ph.D., Oklahoma State U. H. E. Babcock Professor of Food, Nutrition, and Public Policy  
Qi, Ling, Ph.D., U. of Maryland. Asst. Prof.  
Rasmussen, Kathleen M., Sc.D., Harvard U. Prof.  
Sahn, David, Ph.D., Massachusetts Inst. of Technology. Prof.  
Sobal, Jeffery, Ph.D., U. of Pennsylvania. Assoc. Prof.  
Soloway, Paul, Ph.D., Princeton U. Assoc. Prof.  
Stipanuk, Martha H., Ph.D., U. of Wisconsin. Prof.  
Stoltzfus, Rebecca, Ph.D., Cornell U. Assoc. Prof.  
Stover, Patrick, Ph.D., Medical Coll. of Virginia. Assoc. Prof., DNS Director  
Strupp, Barbara, Ph.D., Cornell U. Assoc. Prof.  
Utermohlen, Virginia, M.D., Columbia U. Assoc. Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology

## Other Teaching Personnel

Gier, Emily, M.B.A., Binghamton U. Lec.  
Swanson, Joy, Ph.D., Cornell U. Res. Assoc.  
Travis, Sue, Ph.D., Cornell U. Lec.  
You, Cha-Sook, Ph.D., Cornell U. Teaching Assoc. and Asst. Dir. of Undergraduate Studies

## Joint Appointees

Bauman, Dale, Prof., Animal Science/Nutritional Sciences  
Miller, Dennis, Prof., Food Science/Nutritional Sciences