

DIVISION OF NUTRITIONAL SCIENCES

ADMINISTRATION

Cutberto Garza, director

Carole Bisogni, associate director for academic affairs

Gerald Combs Jr., director of graduate studies, Field of Nutrition

THE DIVISION

Nutritional Sciences draws upon the chemical, biological, and social sciences to understand the complex relationships among 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 through the life span, role of diet in reducing risk of chronic disease, nutritional quality of foods, and interventions and policies designed to promote nutritional health of individuals 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. The faculty 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. An undergraduate program in Nutritional Sciences is offered through the College of Human Ecology, and an undergraduate program, Nutrition, Food, and Agriculture, is offered in the College of Agriculture and Life Sciences. In 1997 a new undergraduate program in Human Biology, Health, and Society was established in the College of Human Ecology. Graduate study is administered through the Field of Nutrition, which includes faculty members throughout the university.

FACILITIES

Most of the faculty members of the division work in Savage Hall, Kinzelberg Hall, and Martha Van Rensselaer Hall. In addition to housing offices, classrooms, and seminar rooms, those buildings contain research facilities, specialized laboratories, a human metabolic research unit, and computer facilities. The division's Learning Resource Center in Martha Van Rensselaer Hall is used by students for individual study and for small group discussions. In addition to printed and audiovisual materials, the Learning Resource Center contains two computers enabling students to have access to specialized software. Savage Hall also has a graduate reading room.

UNDERGRADUATE PROGRAMS

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

Nutritional Sciences, College of Human Ecology: This program provides students with strong training in chemistry and biology and a strong foundation in the broad field of nutritional sciences. Students can 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.

Nutrition, Food, and Agriculture, College of Agriculture and Life Sciences: This program is for students who desire strong training in human nutrition in combination with supportive course work in agriculture and the life sciences. Strong preparation in biology, chemistry, and math is required. Students in the Nutrition, Food, and Agriculture program supplement the nutrition curriculum with courses in such areas as food science, animal science, plant science, advanced biology, business and economics, education, and communication. Students can prepare for a variety of career interests through this program.

Human Biology, Health, and Society, College of Human Ecology: Established in 1997, this program is for students who want to acquire a strong foundation in biology and 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 focus their studies on health issues of their choice through the wide array of courses offered in the College of Human Ecology. 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 CURRICULUM

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

All three undergraduate programs offered by the division require a strong foundation in chemistry and biology, including introductory chemistry and biology, organic chemistry, biochemistry, and physiology. A minimum competency in college algebra is required with additional math and/or statistics required for some programs and career paths. Students in the Human Biology, Health, and Society major also complete a course in physics and two additional courses in advanced biology.

All students complete the introductory course, Nutrition and Health: Concepts and Controversies (NS 115). The Nutritional Sciences major and the Nutrition, Food, and Agriculture program require the completion of four other

core courses: Nutrition and Health: Concepts and Controversies (NS 115); Social Science Perspectives on Food and Nutrition (NS 245); Nutritional and Physicochemical Aspects of Foods (NS 345); Physiological and Biochemical Bases of Nutrition (NS 331); and Methods in Nutritional Sciences (NS 332). Students in these programs also must select a minimum of nine credits in advanced courses in nutritional sciences.

The Human Biology, Health, and Society major requires a minimum of six credits from courses that integrate biology and the social sciences as they examine health issues. In addition, students must also complete nine credits of advanced electives in courses focused on human biology, health, and society.

Undergraduate students in these three programs have a faculty adviser in the Division of Nutritional Sciences. Regular student-adviser conferences are required at least twice a year. Advisers help students plan their course schedules and can suggest opportunities for individual study or experience outside the classroom.

For all three undergraduate programs, correct sequencing of biology, chemistry, and/or nutrition courses is very important. Students considering these programs should get detailed information about course requirements from the division's Academic Affairs Office, 309/335 MVR.

CAREER OPTIONS AND COURSE PLANNING

Requirements for the three programs are the minimum set of courses necessary for a bachelor's degree in these fields. Students should supplement the 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 areas from which students can choose electives for different career interests follows.

Medicine and Other Health Careers:

Recommended courses for pre-med students include calculus and two terms 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 the requirements for their interests. 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 additional information about meeting ADA requirements see Anne Kendall, 3M5 MVR.

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 for schools of interests. For information about the Applied Exercise Science Concentration, contact the DNS Academic Affairs Office, 309 MVR.

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 rural sociology.

International Nutrition: Recommended electives include courses in language, anthropology, agricultural economics, policy, economics, rural 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 an opportunity to study and gain field experience in New York City. All students intending to spend a term 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 400, 401, 402) 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 adviser and the approval of the associate director for academic affairs or consider applying to the honors program.

HONORS PROGRAM

The honors program, leading to a B.S. degree with honors 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 courses in designing and evaluating research, complete an original piece of research, 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 Michael Kazarinoff, 230 Savage Hall.

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 115, Nutrition and Health: Concepts and Controversies, is open to all students. After NS 115, nonmajors with limited backgrounds in chemistry and biology may elect NS 247, Food for Contemporary Living; NS 262, Nutrients and Cells; NS 275, Human Biology and Evolution; NS 306, Nutritional Problems of Developing Nations; NS 315, Obesity and the Regulation of Body Weight; NS 347, Human Growth and Development: Biological and Behavioral Interactions; NS 380, Integrating Food Systems and Human Nutrition Needs; NS 450, Public Health Nutrition: NS 457, National and International Food Economics. Nonmajors with strong backgrounds in chemistry and the biological sciences may consider NS 331, Physiological and Biochemical Bases of Human Nutrition, as well as many advanced nutritional sciences courses, such as NS 345 Physicochemical and Nutritional Aspects of Foods; NS 421, Nutrition and Exercise; and NS 441, Nutrition and Disease.

GRADUATE PROGRAMS

Graduate study is administered by the Field of Nutrition, a group of more than fifty 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 animal

nutrition, human nutrition, international nutrition, nutritional biochemistry, foods, or general nutrition. Research is emphasized in all graduate programs. Field experience may be a component of concentrations in community, international and public-health nutrition, and nutrition education.

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 choice 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, and students in international nutrition are expected to conduct their thesis research abroad.

For more information about the graduate program, interested persons may write for the brochure Graduate Study in Nutrition, available from the Director of Graduate Studies, Field of Nutrition, Cornell University, MVR Hall, Ithaca, New York 14853-4401; telephone (607)255-4410.

COURSES

NS 115 Nutrition and Health: Concepts and Controversies

Fall. 3 credits. S-U grades optional. M W F 1:25. D. Levitsky.

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

NS 116 Personalized Concepts and Controversies

Fall. 1 credit. Corequisite: NS 115. S-U only. Limited to freshmen and transfer students, 10 per section. TBA. D. Levitsky.

This course provides students enrolled in NS 115 individualized assistance in many skills used in NS 115 including using computers to analyze diets, using electronic mail, finding and using scientific references, and reviewing material presented in NS 115 lectures.

NS 120 Nutrition and Health: Issues, Outlooks, and Opportunities

Spring. 1 credit. S-U grades only. Limited to 120 freshmen, sophomores and juniors, others by permission of instructor. W 12:20. C. Bisogni.

A course for students interested in exploring careers in the broad fields of food, nutrition, and health. Experts representing different areas will discuss their work, focusing on current issues and trends as well as the requisite knowledge and skills. This course describes the many disciplines that are drawn upon in the solution of human problems related to food, diet, and health as well as the related intellectual and career opportunities. This is not an introductory nutrition course for nonmajors.

NS 200 Vegetarian Nutrition: An Introduction

Fall. 3 credits. S-U grades optional. Prerequisites: NS 115 advised but not essential. M W F 11:15. T. C. Campbell. This introductory course will survey vegetarianism from a variety of nutrition and health considerations. The principal material will include the empirical scientific evidence presented for easy comprehension for students without nutrition training. The historical and sociocultural roots, both ancient and of more recent times, that have led to the growing interest in, and acceptance of, this type of dietary practice will be examined. Particular attention will be given to the role of vegetarianism in the prevention and reversal of chronic degenerative diseases. Special topics on competitive sport, childhood nutrition, food preparation, and dietary transition will be offered. Internationally known guest speakers.

NS 222 Maternal and Child Nutrition

Spring. 3 credits. Prerequisites: NS 115 and a college biology course or permission of the instructor. S-U grades optional. Limited to 25 students. Preregistration is required in room 309 Martha Van Rensselaer Hall. M W F 1:25. C. Garza. Involves the study of nutritional requirements in pregnancy, lactation, infancy, and childhood growth through adolescence. Topics include the relationship between maternal diet and pregnancy outcome; analysis of different methods of infant feeding; and nutritional status of pregnant women, children, and adolescents in the United States and in developing countries.

NS 245 Social Science Perspectives on Food and Nutrition

Fall. 3 credits. Prerequisite: NS 115. Limited to nutrition majors. Letter grade only. T R 10:10-11:25. J. Sobal, D. Sanjur. Theories, concepts, and methods from the social sciences will be applied to food and nutrition topics and issues. Emphasis will be placed on theories about the formation and modification of food choices, dietary methodologies, ethnicity and food habits, and educational programs in nutrition in both national and international contexts.

NS 247 Food for Contemporary Living

Fall and spring. 1 credit. Laboratory sections limited to 32 students. Preregistration during course pre-registration required in 309 Martha Van Rensselaer Hall. Laboratory coat or apron required. Fall T 1:25-4:25; spring T 1:45-4:25 or R 9:05-12:05. A. Kendall. Emphasizes meal planning for healthy individuals using national nutrition standards; the development of food preparation and presentation skills; the application of sensory evaluation techniques; and ethnic and cultural influences on cuisine.

NS 262 Nutrients and Cells

Spring. 3 credits. Prerequisites: one semester of biology and chemistry. M W F 9:05. N. Noy. The course will focus on the relationships of the cell with the environment. Examples from three general areas will be considered: 1. Mechanisms of uptake of nutrients by bacterial and by mammalian cells. 2. Intracellular outcomes of nutritional stimuli: effects on metabolism and gene expression, toxicity. 3. Pathways of neutralization: detoxification, secretion, DNA repair.

NS 275 Human Biology and Evolution (also Biological Sciences 275 and Anthropology 275)

Fall. S-U grades optional, with permission of either instructor. Offered alternate years. See BIO SCI 275 for course description.

NS 300 Special Studies for Undergraduates

Fall or spring. Prerequisites: permission of instructor. S-U grades optional. DNS faculty. Special arrangements to establish equivalency for courses not transferred from a previous major or institution. Students prepare a description of the study they want to undertake on 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 306 Nutritional Problems of Developing Nations

Fall. 3 credits. Prerequisites: NS 115. S-U grades optional. T R 10:10. Not offered 1998-99. J-P. Habicht, M. C. Latham, J. D. Haas. The course is designed for undergraduates interested in the nutritional problems of developing countries. Attention is given to the array of nutrition problems encountered, the causes of hunger and malnutrition, the epidemiology of the major nutritional problems afflicting poor nations, the functional consequences of these problems on individuals and societies, and the types of programs that can be implemented to improve health and nutrition.]

[NS 315 Obesity and the Regulation of Body Weight (also Psychology 613)

Spring. 3 credits. Prerequisites: NS 115, Psych 101. Limited to juniors and seniors. S-U grades optional. Offered alternate years. T R 1:30-3:00. Next offered 1999-2000. D. Levitsky. This course is a multidisciplinary discussion of the causes, effects, and treatments of human obesity. Topics include the biopsychology of eating behavior, genetics of obesity, role of activity and energy metabolism, psychosocial determinants of obesity, anorexia nervosa, therapy and its effectiveness, and social discrimination.]

NS 320 Introduction to Human Biochemistry

Fall. 4 credits. Prerequisites: one year college biology; one year college general chemistry; and CHEM 257 or 357-358; or permission of the instructor. S-U grades optional. M W F 10:10, sec F 11:15. W. Arion, P. Stover. The principles of biochemistry are presented within the context of human health and disease. Metabolism of carbohydrates, lipids, proteins and selected micro-nutrients is taught from a perspective that emphasizes their role in supporting the structure and physiological functions of the major organs of the body, including blood. The concepts of enzyme catalysis, enzyme regulation, hormone action and bioenergetics are incorporated within this framework. The fundamental concepts of eucaryotic DNA structure, function and gene expression are covered with reference to their importance in regulating metabolism and the impact of a changing nutrient environment.

NS 331 Physiological and Biochemical Bases of Human Nutrition

Spring. 4 credits. Prerequisites: Biological Sciences 330 or 331 or equivalent. S-U grades optional. Lec M W F 10:10; disc, W or R. M. Stipanuk, C. McCormick. This course examines the biochemical and physiological bases of human nutritional requirements. The instructors use an integrated approach to cover the digestion and metabolism of the nutrients (carbohydrates, proteins, lipids, vitamins, and minerals). Metabolic and chronic diseases that are related to nutrition are discussed throughout the semester. The discussion sections provide an opportunity to examine in greater depth selected topics covered in lecture.

NS 332 Methods in Nutritional Sciences

Fall and spring. 3 credits. Each section limited to 18 students. Prerequisites: NS 345, NS 331 preferred or concurrent registration. Laboratory preregistration during course preregistration required in room 309 Martha Van Rensselaer Hall. One evening prelim to be scheduled. Fall. Lec M 12:20; lab M W 1:25-4:00 or M W 6:30-9:00 or T R 10:10-1:10. Spring. Lec M 12:20; labs M W 1:25-4:00 or T R 10:10-1:10 or M W 6:30-9:30. J. T. Brenna, M. N. Kazarinoff.

Laboratory introduction to principles and analytical techniques of nutritional research. Emphasis is on 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, and methods for assessing individual food intake and nutritional status.

NS 341 Human Anatomy and Physiology

Spring. 4 credits. Letter grade only. Prerequisites: college biology; NS 115 recommended. Limit 120. Lec W F 12:20; lab W or R or F, 9:05-11:00 or 2:30-4:25. V. Utermohlen. Introduction to human anatomy and physiology with particular emphasis on aspects of relevance to nutrition sciences and medicine. All major organ systems will be covered. Laboratories will emphasize location, recognition, and description of anatomical structures and testing of physiological function with an emphasis on tests of nutritional and medical relevance.

NS 345 Nutritional and Physicochemical Aspects of Food

Spring. 3 credits. Prerequisite: college course in organic chemistry or biochemistry. S-U grades optional. T R 1:25-2:40. B. Lewis, B. Parker. A study of the nutritional, physical and chemical properties of foods including composition, food structure, enzymic and nonenzymic phenomena, and processing/preparation aspects. Issues related to food safety, regulation, and food composition data bases will also be discussed.

NS 346 Introduction to Physicochemical Aspects of Foods—Laboratory

Spring. 1 credit. Each section limited to 18 students. Limited to dietetics students in DNS. Prerequisites: NS 345 or concurrent registration; a college course in organic chemistry and permission of instructor during course registration (permission-of-instructor forms must be obtained from and returned to 309 MVR).

Letter grade only. M 12:20-3:20 or T 9:05-12:05. B. Lewis, R. Parker.

Laboratory exercises designed to illustrate principles related to food quality and ingredient functionality, and to introduce students to the analytical methodology associated with food evaluation.

NS 347 Human Growth and Development: Biological and Behavioral Interactions (also Human Development and Family Studies 347 and Biology and Society 347)

Spring. 3 credits. Prerequisites: Biological Sciences 101 or 109 or equivalent; Human Development and Family Studies 115 or Psychology 101 or equivalent. Offered alternate years. M W F 1:25. J. Haas, S. Robertson.

This course is concerned with the interrelationships between physical and psychological growth and development in humans, particularly during infancy. Intrinsic and extrinsic causes of variations in growth, including various forms of stimulation, are considered. In addition, the consequences of early growth and its variation for current and subsequent behavioral, psychological, and physical development are examined. The interaction between physical and behavioral or psychological factors is emphasized throughout the course.

NS 361 Biology of Normal and Abnormal Behavior

Fall. 3 credits. Prerequisites: Biological Sciences 101-102 and Psychology 101, or permission of the instructor. A fundamental knowledge of biology and psychology is essential. S-U grades optional. Limited to juniors and seniors. M W F 9:05. B. Strupp.

A critical evaluation of biological factors thought to influence behavior and/or cognitive functioning. Biological, psychological, and societal influences will be integrated. Topics include nutrition and behavior, psychiatric disorders, developmental exposure to environmental toxins and drugs of abuse, and biopsychology of learning, memory, intelligence, and related cognitive disorders.

NS 378 Food, Nutrition, and Service Management

Fall. 3 credits. Prerequisites: NS 115, NS 247 or permission of instructor. T R 8:40-9:55. TBA.

The application of management principles and theory to foodservice operations and nutrition services is discussed. The systems concept of organization is used. Emphasis is placed on leadership development, decision making/problem solving as related to procurement, production, distribution, and quality assurance in food and nutrition services. Recipe and menu development projects show the interrelationships of nutrition, labor, equipment, and environmental concerns. Marketing strategies and implementation are discussed.

NS 380 Integrating Food Systems and Human Nutrition Needs

Spring. 2 credits. Prerequisites: NS 115 or Food 200 or An Sc. 100. Letter grade only. T R 8:40-9:55. G. Combs.

A student-centered course that employs case studies to address concepts linking human nutrition and health issues to those involving systems of food production and distribution. Student teams will investigate new and existing technological options within food systems to address domestic or international

human nutrition needs.

NS 398 Honors in Nutritional Sciences

Fall. 1 credit. Limited to students admitted to the division honors program. S-U grades only. T 12:20. M. Kazarinoff. Research design. Analysis of research papers on selected topics.

NS 400-401-402-403 Special Studies for Undergraduates

Fall or spring. Credits to be arranged. S-U grades optional. Division faculty.

For advanced independent study by an individual student or for study on an experimental basis with a group of students in a field of nutritional sciences not otherwise provided through course work in the division or elsewhere at 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 associate director for academic affairs. The form, available from the department office, is filed at course registration or within the change-of-registration period along with an add/drop slip in 145 MVR, College Registrar Office. To ensure review before the close of the course registration or change-of-registration period, students should submit the special-studies form to the associate director for academic affairs as early as possible.

NS 400 Directed Readings

For study that predominantly involves library research and independent reading.

NS 401 Empirical Research

For study that predominantly involves data collection and analysis or laboratory or studio projects.

NS 402 Supervised Fieldwork

For 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 403 Teaching Apprenticeship

For study that includes assisting faculty with instruction.

[NS 421 Nutrition and Exercise

Spring. 3 credits. Prerequisites: Bio S 311 or NS 341 and NS 115 or NS 331. S-U grades optional. M W F 11:15. Not offered 1998-99. Division faculty.

This course will acquaint students with the interaction between nutrition, exercise, and athletic performance. Topics will cover the biological, psychological, and sociological aspects of nutrition in exercise performance. Students will learn nutritional counseling techniques in educating the recreational and professional athlete, coach, and trainer.]

NS 431 Mineral Nutrition and Chronic Disease

Fall. 2 credits. Prerequisites: NS 331, AnSci 410, or permission of instructor. S-U grades optional. T R 11:15. C. McCormick.

We will evaluate the evidence that diet plays a role in osteoporosis and hypertension and whether iron status affects the development of heart disease and inflammation. A goal of the course is to review the data upon which recommendations for daily nutrient intakes are currently based. Class discussion of key research articles will be conducted and evaluated.

NS 441 Nutrition and Disease

Fall. 4 credits. Prerequisites: NS 331 and a human physiology course. S-U grades optional. M W F 10:10; F 8:00. V. Utermohlen.

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

NS 442 Implementation of Nutrition Care

Fall. 3 credits. Prerequisites: NS 247, concurrent registration in NS 441 (or equivalent background in either course). S-U grades optional. Lec M W F 9:05. A. Kendall.

Development of skills necessary to implement nutrition care: nutrition screening, interviewing and counseling, dietary assessment, principles of medical nutrition therapy, menu planning for disease states, quality assurance.

NS 450 Public Health Nutrition

Spring. 3 credits. Prerequisites: NS 115, and one course dealing with population-level studies, e.g., NS 245, HDFS 150, PAM 201, PAM 303, RSOC 100, RSOC 200. M W F 11:15. K. Rasmussen, D. Pelletier.

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 community, state, and national levels. This course helps prepare students to work in public health nutrition by describing methods used in the assessment of nutrition problems, development of nutrition-related policies, and delivery of health, nutrition and food assistance programs.

NS 451 Epidemiology and Health of Human Communities

Fall. 3 credits. Prerequisite: one semester of statistics (can be taken concurrently). M W F 1:25. E. Frongillo.

Examines through a series of case studies the role of epidemiological investigation in understanding, assessing, and improving the health and nutrition of human communities and populations. Students will read, discuss, and integrate scientific research and public policy literature on specific topics of current interest. Emphasis is on the conceptualization of epidemiology as an ecological science that studies the interdependence and interaction of humans with their social, cultural, and physical environment. Intended for advanced undergraduates and graduate students with an interest in health, human biology, nutrition, or epidemiology.

NS 457 National and International Food Economics (also Economics 374)

Spring. 4 credits. Prerequisites: Econ 101 or CEH 110 and junior standing, or permission of instructor. S-U grades optional. M W F 9:05. E. Thorbecke.

Analysis of the world food economy. Review and analysis of the major economic factors determining the demand for food, the composition of food consumption, and nutritional intake; and the major economic factors affecting food production and supply. Evaluation of effectiveness of various policies and programs in alleviating poverty and malnutrition.

NS 488 Applied Dietetics in Foodservice Systems

Spring. 3 credits. Limited to 27 students. Prerequisites: NS 378, Micro 290. Laboratory preregistration during course preregistration is required in room 309 Martha Van Rensselaer Hall. White lab coat is required. Approximately \$25.00 will be needed for special supplies/activities. Lec M W 9:05; labs, M or T or W 1:30-6:00. TBA.

Students will gain experience in facility design; equipment selection, use, and care; job analysis and evaluation; human resources planning; management of financial resources; menu planning, recipe development, volume food production; computer-assisted management; employee training; applied safety and sanitation standards and will develop other skills required to operate/manage a foodservice program. The application of quality management in food service operations and facility management is stressed. Laboratories will be arranged through Cornell Dining.

NS 498 Honors in Nutritional Sciences

Spring. 1 credit. Limited to students admitted to the division honors program. Students may register in NS 499 concurrently. M or F 2:30. M. Kazarinoff and Division faculty.

Juniors (Mondays). Discussion of research opportunities in nutrition and orientation to research facilities. Delineation of honors research problems in consultation with faculty mentors. Seniors (Fridays). Workshop sessions on honors thesis and oral presentation preparation.

NS 499 Honors Problem

Fall and spring. Credits to be arranged. Open only to students in the division honors program. M. Kazarinoff and Division faculty.

An independent literature, laboratory, or field investigation. Students should plan to spread the work over two or more semesters.

NS 600 Special Problems for Graduate Students

Fall or spring. Credit to be arranged. Limited to graduate students recommended by their chair and approved by the instructor in charge. S-U grades optional. Division faculty.

Emphasis on independent advanced work. Experience in research laboratories in the division may be arranged.

[NS 601 Proteins and Amino Acids (also Animal Science 601)]

Spring. 2 credits. Prerequisites: physiology, biochemistry, and nutrition. Offered alternate years. W F 12:20. Not offered 1998-99. R. E. Austic.

A course emphasizing the dynamic aspects of protein digestion and absorption, amino acid transport, and amino acid and nitrogen metabolism and their relationships to the requirements for amino acids.]

NS 602 Lipids (also Bio Sci 619)

Fall. 2 credits. T R 11:15. A. Bensadoun. Advanced course on biochemical, metabolic, and physiological aspects of lipids, more specifically lipid transport. Topics covered include lipid methodology, structure of plasma lipoproteins, molecular biology and cell biology of apolipoproteins, lipoprotein receptors, lipid transfer factors, lipolytic enzymes, and atherosclerosis.

NS 603 Mineral Nutrition: Metabolic, Health, and Environmental Aspects (also An Sc 603)

Fall. 2 credits. Letter grade only. Prerequisites: biochemistry, physiology, and nutrition. T 2:20-4:25. Offered alternate years, next offered 1998-99. X. G. Lei, G. F. Combs, Jr.

Course emphasizes the metabolic roles and environmental impacts of mineral nutrition in animal, human, and food systems. Team-taught lectures include general biochemical and physiological aspects of mineral metabolism and specific mechanisms of gene expression regulation and mammal health disorders associated with individual elements. Methodology and facility of mineral research is also discussed.

NS 604 The Vitamins (also An Sc 604)

Fall. 2 credits. T R 10:10. G. Combs. Text-based discussion sessions on nutritional aspects of the vitamins, including recent developments in nutritional and biochemical interrelationships with other nutrients and metabolites.

NS 607 Nutrition as an Integrating Discipline: Concepts and Paradigms

Fall. 3 credits. Prerequisite: some prior coursework or experience in nutrition, or permission of the instructor. M W F 10:10. M. Kazarinoff, J-P. Habicht, and division faculty.

An overview course for beginning graduate students in nutrition and related disciplines to introduce them to the full breadth of nutritional science disciplines, including quantitative and qualitative sciences. Also suitable for seniors as an integrating course. The course presents concepts and paradigms of molecular biology, biochemistry, clinical nutrition, epidemiology, anthropology, economics, program planning and administration, policy development, and ethics. This semester the course uses Vitamin A as the example. Emphasis will be placed on the integration of factual and conceptual knowledge to solve nutrition problems in human societies.

NS 611 Molecular Toxicology (also Toxicology 611)

Spring. 3 credits. Prerequisite: Toxicology 610 and a full-year 400-level course in biochemistry or equivalent. S-U grades optional. TBA. S. Bloom, R. Dietert.

A study of fundamental biochemical mechanisms of absorption, transport, metabolism, and excretion of drugs, carcinogens, and toxicants. Emphasis on oxidative and conjugative pathways of metabolism and of environmental and nutritional factors that influence toxicant metabolism and disposition. Methods of evaluating in vivo and in vitro metabolism.

NS 612 Methods of Assessing Physical Growth in Children

Spring. 3 credits. Limited to graduate students and students who have permission of the instructor. A previous course in statistics required. S-U grades optional. Lec T 1:25; lab, R 1:25-4:25; disc T 2:15-3:05. J. Haas.

A laboratory course to train students in methods and techniques used to assess the physical growth and development of children. The methods explored are those applicable for field, community, and clinical studies and cover anthropometry, body composition, skeletal age, maturity indicators, physical

fitness, and energy expenditure.

NS 614 Topics in Maternal and Child Nutrition

Fall. 3 credits. Prerequisites: NS 331, and 222 or 347, Biological Sciences 311, and permission of instructor. T R 8:30-9:55. K. Rasmussen.

Advanced course on the role of nutrition during pregnancy and lactation. 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 617 Teaching Seminar

Fall or spring. 0 credit. Limited to division graduate students and students who have permission of the instructor. S-U only. C. Bisogni, D. Way.

Individualized instruction focusing on development of teaching skills for guiding classroom learning in lecture, discussion, and laboratory settings. Preparation of content, presentation, and interaction techniques and evaluative methods are emphasized in relation to the student's specific teaching assignment. Videotape simulations provide opportunity for practice and analysis of teaching behaviors.

NS 618 Teaching Experience

Fall or spring. 0 credit. Limited to division graduate students and students who have permission of instructor. S-U only. C. Bisogni.

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 619 Field of Nutrition Seminar (also Animal Science 619)

Fall or spring. 0 credit. S-U only. M 4:00. Faculty and guest lecturers.

Lectures on current research in nutrition.

[NS 620 Food Carbohydrates (also Food Science 620)]

Spring. 2 credits. Prerequisites: Biological Sciences 330 or equivalent. Letter grades only. Offered alternate years. T R 10:10. Not offered 1998-99. J. Brady, B. Lewis.

A consideration of the chemistry of carbohydrates, including sugars and complex carbohydrates (starches, pectins, hemicelluloses, gums, cellulose, and glycoconjugates). Emphasis is on intrinsic chemistry, functionality in food systems, and changes occurring during food processing and storage.]

NS 626 Special Topics in Food

Fall. 2 credits. TBA. B. Lewis. Current research related to basic concepts of foods, nutrition, and health issues.

NS 631 Dietary Assessment

Fall. 1 credit. 7 weeks only. Prerequisites: statistics and NS 331 or equivalent. Enrollment limited. R 2:30-5:30. D. Sanjur.

Study of methods and techniques for assessing dietary intakes at the individual and household levels.

NS 635 Mechanisms of Metabolic Regulation and Mammalian Gene Expression (also BioBM 635)

Spring. 2 credits. Prerequisites: at least 4 credits of Principles of Biochemistry and Chem 358 or 360, or permission of instructor. Offered alternate years. Lec T R 9:05. M. N. Kazarinoff, N. Noy, P. Stover.

Molecular mechanisms by which sensory, hormonal, and nutritional inputs cause changes in enzyme activity in order to regulate metabolic transformations. Gene expression, protein modification, and allosteric effects will be emphasized using examples from mammalian systems. Identification and characterization of regulatory steps in metabolism will be considered from both theoretical and practical aspects.

[NS 636 Integration and Coordination of Energy Metabolism (also Biological Sciences 637)]

Fall. 3 credits. Prerequisites: Biological Sciences 330 and 331, or equivalent. M W F 9:05. Not offered 1998-99.

The dynamics of energy metabolism in humans and higher animals are developed through characterizations of how the metabolic components support the structure and function of the individual tissues. Mechanisms that control and coordinate energy metabolism within and between organs are analyzed in the context of selected physiological and pathological stresses.]

NS 637 Epidemiology of Nutrition

Spring. 3 credits. Limited to graduate students. Prerequisites: Biometry 601 and concurrent registration in Biometry 602 or NS 641 or equivalent knowledge. Basic knowledge about the nutritional aspects of growth and development and about nutritional biochemistry. TBA. J-P. Habicht.

Course covers principles of nutritional epidemiology, impact assessment of nutrition intervention programs, and nutritional surveillance. Teaching principles of using nutritional information for decision making, including the levels of evidence about nutrition and health for making decisions. The course shows how the biochemistry and physiology of nutrition can be related to epidemiological assessment and research strategies.

NS 638 Epidemiology of Nutrition Seminar

Spring. 3 credits. Reserved for graduate students planning field intervention studies; by permission of instructor.

Prerequisite: NS 637. TBA. J-P. Habicht. Covers the meta-analysis, design, measurement, and analytic issues involved in developing, implementing, and analyzing studies of field interventions with nutritional impact.

NS 639 Epidemiology Seminar (also Statistics and Biometry 639)

Spring. 0-1 credit. Limited to graduate students; others by permission of instructor. Contact P. Cassano 255-7551 for permission and credit information. S-U grades only. M 12:20. P. Cassano.

This course will develop skills in the preparation and interpretation of epidemiological data by discussing current research topics and issues.

NS 640 Social Science Theories in Nutrition

Fall. 3 credits. Limited to 20 graduate students. M W 2:30-3:40. J. Sobal.

Social science theories from sociology, psychology, anthropology, economics, political science, geography, and history that contribute to understanding food and nutrition will be examined. Examples of approaches, concepts, and methods from different disciplines will be discussed to understand how to apply social science theories to nutrition topics, issues, and problems.

NS 641 Applied Regression Methods

Spring. 3 credits. Prerequisite: BTRY 601 or equivalent. M W F 11:15. E. Frongillo.

Second statistics course intended for graduate students who need to apply regression methodology in nutrition, health, epidemiology, human services, human development, program intervention, or related fields. The course covers the conceptual and statistical aspects of regression models for continuous, discrete, and time-to-event response variables with multiple covariates. Interpretation of parameters, confounding and interaction, and assessing fit are emphasized. An introduction to modeling complex observational data with multiple response variables is presented.

NS 644 Community Nutrition Seminar

Fall and spring. Non-credit. S-U only.

Fall M 11:15, spring M 12:20. A. Gillespie and Cornell Community Nutrition faculty.

This seminar sponsored by the Cornell Community Nutrition Program focuses on research presentations in nutrition education and other areas of community nutrition. Cornell faculty and graduate students and outside invited speakers present research proposals, results from ongoing research, theoretical bases for research, program evaluations, and discuss current programs and issues in community nutrition. The format varies but always includes discussion by participants.

NS 645 Nutrition Intervention in Communities: A Global Perspective

Spring. 3 credits. Limited to 25 graduate students with an interest in human nutrition and health and exceptional senior nutrition majors by permission. Prerequisite: NS 640. M W 1:25-2:40. C. Olson.

The goal of the course is to help students gain tools and develop conceptual frameworks for thinking critically about nutrition interventions in communities around the world. The course involves extensive reading, active involvement in class discussions and fieldwork.

NS 646 Seminar in Physicochemical Aspects of Food

Spring. 1-3 credits. Prerequisite: a college course in organic chemistry or biochemistry. S-U grades optional. T R 1:25-2:40. B. Lewis, B. Parker.

An introduction to physicochemical aspects of food, for graduate students who have had limited or no work in this area. The seminar uses the lectures of NS 345 as a basis for supplementary readings and critical review of research on selected topics.

NS 660 Special Topics in Nutrition

Fall or spring. 3 credits maximum each term. Registration by permission of the instructor. Division 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. Topics may be changed so that the course may be repeated for credit.

NS 680 International Nutrition Problems, Policy and Programs

Fall. 3 credits. Prerequisite: permission of instructor. T R 11:15-12:30. M. Latham.

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 assist poor countries and communities to improve their nutritional and health status.

NS 681 Nutritional and Public Health Importance of Human Parasitic Infections

Fall. 2 credits. Prerequisites: graduate student status or permission of instructor. S-U grades optional. M 2:30-4:15. L. Stephenson.

Reviews the scientific evidence for relationships between human nutritional status and common human parasitic infections. Concentrates on malnutrition (protein-energy malnutrition, anemia) in developing countries. Parasitic infections emphasized are malaria, hookworm, ascaris, schistosomiasis, and trichuriasis. Format is lecture-discussion.

NS 683 Field Studies in International/Community Nutrition

Fall. 1 credit. Graduate student status or permission of instructor required. Strongly recommended for graduate students doing field research. S-U grades only. Mainly audio-tutorial format. Available as independent study most semesters. TBA. L. Stephenson.

Reviews practical considerations in conducting field research in developing countries, including (1) seeking fundings, (2) experimental design issues, (3) choice of procedures, and (4) planning for and carrying out data collection. Also includes how to a) construct a C.V., b) write an abstract and prepare a clear 10-minute talk with legible slides (FASEB formation), and c) when, where, and how to publish research results. Extensive handouts. Lecture/demonstration/discussion.

NS 685 Food and Nutrition Policy (also Agricultural Economics 685)

Spring. 3 credits. Prerequisites: introductory microeconomics, intermediate statistics (through multiple regression), or instructor's permission. M W 2:55-4:10. D. Sahn.

This course examines the role of government policy in alleviating poverty, food insecurity, and malnutrition in developing countries. Topics covered include methodologies for economic policy analysis of time use and food acquisition behavior, the "production" of nutritional outcomes, and the role of price policy and markets. Course readings draw largely on examples from Africa and Asia.

[NS 690 Trace Element and Isotopic Analysis (also Chemistry 628)]

Spring. 3 credits. Primarily for graduate students. Prerequisite: Chemistry 288 or 390, or Chemistry 208 and Physics 102 and Mathematics 112, or permission of instructor. S-U grades optional. Offered alternate years. T R 10:10. Not offered 1998-99. J. T. Brenna.

See CHEM 628 for course description.]

NS 698 International Nutrition Seminar

Fall and spring. No credit. No grades given. R 12:20-1:10. J. Haas, J-P. Habicht. This seminar series consists of presentations by Cornell faculty and graduate students, and by outside invited speakers. Speakers cover a range of topics which relate to nutritional problems, policy, and programs in the non-industrialized countries.

NS 699 Special Topics in International Nutrition

Fall and spring. 3 credits maximum each term. Registration by permission of instructor. Faculty in Program in International Nutrition.

This option is 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 usually of tutorial study on an agreed topic. Because the topics change, the course may be repeated for credit.

NS 700 Current Topics in Toxicology (also Toxicology 698)

Fall or spring. 1-3 credits. S-U grades optional. TBA. Staff.

A discussion of the most current developments in various areas of toxicological research and testing. Faculty and students will participate jointly in evaluating research findings and provide seminars and discussion of such material. For information regarding topic, instructor, and credit, contact the office of the Graduate Field of Environmental Toxicology.

NS 702 Seminar in Toxicology (also Toxicology 702)

Fall or spring. 1 credit. S-U grades only. F 12:20. Staff.

The seminar program covers varied topics in biochemical, genetic, nutritional, veterinary, and regulatory toxicology, ecotoxicology, and environmental chemistry. Included are 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 703 Seminar in Nutritional Sciences

Fall and spring. 1 credit. S-U grades only. T 12:20 or W 12:20. Division faculty.

Presentations of original articles pertinent to the Nutritional Sciences. Students will learn how to make professional presentations and how to critique the presentations by others. In addition, students will learn how to read and interpret original articles published in a wide variety of journals.

[NS 707 Nutrition as an Integrating Discipline: Evaluation, Criticism, Application]

Fall. 3 credits. Prerequisites: advanced graduate standing and permission of the instructor. 2-hour class period per week plus discussion and workshop. M 1:25-3:20. Not offered 1998-99. M. Kazarinoff, K. Rasmussen.

The goal of this course is to provide an integrative capstone learning experience for advanced graduate students with majors or minors in nutrition. Groups of students will focus on a series of special problems in nutrition drawn from those currently faced by nutrition professionals. Special problems may involve assuming the role of consultants, expert committee members or peer-reviewers who are charged with answering questions or formulating recommendations related to research, programs, or policies.]

NS 899 Master's Thesis and Research

Fall or spring. Credit to be arranged. Prerequisite: permission of the chair of the graduate committee and the instructor. S-U grades optional. Division graduate faculty.

NS 999 Doctoral Thesis and Research

Fall or spring. Credit to be arranged. Prerequisite: permission of the chair of the graduate committee and the instructor. S-U grades optional. Division graduate faculty.

FACULTY ROSTER

Arion, William J., Ph.D., U. of N. Dakota. Prof.
 Bensadoun, Andre, Ph.D., Cornell U. Prof.,
 Nutritional Sciences/Physiology
 Bisogni, Carole, Ph.D., Cornell U. Assoc. Prof.
 and Associate Director for Academic Affairs
 Brenna, Thomas, Ph.D., Cornell U. Assoc.
 Prof.
 Campbell, T. Colin, Ph.D., Cornell U. Jacob
 Gould Schurman Professor of Nutritional
 Biochemistry
 Chen, Junshi, M.D., Peking Medical College,
 China. Adjunct Prof.
 Combs, Gerald F. Jr., Ph.D. Cornell U. Prof.
 Crompton, D. W. T., Ph.D., Sc.D., U. of
 Cambridge (England). Adjunct Prof.
 Devine, Carol M., Ph.D., Cornell U. Asst. Prof.
 Frongillo, Edward, Jr., Ph.D. Cornell U.
 Assoc. Prof.
 Garza, Cutberto, M.D., Baylor College; Ph.D.,
 MIT. Director and Prof.
 Gillespie, Ardyth, Ph.D., Iowa State U. Assoc.
 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
 Jonsson, Urban, Ph.D., Chalmers U. Tech.
 (Sweden). Adjunct Prof.
 Kazarinoff, Michael N., Ph.D., Cornell U.
 Assoc. Prof., Nutritional Sciences/Biochem-
 istry, Molecular and Cell Biology
 Latham, Michael C., D.T.M.&H., U. of London
 (England). Prof.
 Levitsky, David A., Ph.D., Rutgers U. Prof.
 Lewis, Bertha A., Ph.D., U. of Minnesota.
 Assoc. Prof.
 McCormick, Charles, Ph.D., North Carolina St.
 U. Assoc. Prof.
 Noy, Noa, Ph.D., Tel-Aviv U. (Israel), Assoc
 Prof.

Olson, Christine M., Ph.D., U. of Wisconsin.
 Prof.
 Parker, Robert S., Ph.D., Oregon State U.
 Assoc. Prof.
 Pearson, Thomas, Ph.D., Johns Hopkins U.
 Adjunct Prof.
 Pelletier, David, Ph.D., The Pennsylvania State
 U. Assoc. Prof.
 Peto, Richard, M.Sc., U. London (England).
 Adjunct Prof.
 Rasmussen, Kathleen M., Sc.D., Harvard U.
 Prof.
 Rivera, Juan, Ph.D., Cornell U. Adjunct Asst.
 Prof.
 Sahn, D., Ph.D., M.I.T. Prof.
 Sanjur, Diva M., Ph.D., Cornell U. Prof.
 Sobal, Jeffery, Ph.D., U. of Pennsylvania.
 Assoc. Prof.
 Stephenson, Lani, Ph.D., Cornell U. Assoc.
 Prof.
 Stipanuk, Martha H., Ph.D., U. of Wisconsin.
 Prof.
 Stover, Patrick, Ph.D., Med. College of
 Virginia. Asst. Prof.
 Strupp, Barbara, Ph.D., Cornell U. Assoc.
 Prof.
 Thorbecke, Erik, Ph.D., U. of California.
 H. E. Babcock Professor of Economics
 and Food Economics
 Utermohlen, Virginia, M.D., Columbia U.
 Assoc. Prof., Nutritional Sciences/Biochem-
 istry, Molecular and Cell Biology

Other Teaching Personnel

Kendall, Anne, Ph.D., R.D., Cornell U.
 Lecturer and Director of Dietetics Program

Joint Appointees

Bauman, Dale, Prof., Animal Science/
 Nutritional Sciences
 Miller, Dennis, Prof., Food Science/Nutritional
 Sciences
 Van Campen, Darrell R., Assoc. Prof.,
 U.S. Plant, Soil, and Nutrition Laboratory/
 Nutritional Sciences