

## DIVISION OF NUTRITIONAL SCIENCES

### ADMINISTRATION

Jere Haas, director

Carole Bisogni, associate director for academic affairs

Noa Noy, director of graduate studies, Field of Nutrition

### 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, role of diet in reducing risk of chronic disease, nutritional quality of foods, and interventions and policies designed to promote the 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. The 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 within the College of Human Ecology. 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 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. 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 which give students 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 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.

**Nutrition, Food, and Agriculture**, College of Agriculture and Life Sciences: this program is for students who want strong training in human nutrition combined with supportive course work in the 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 areas such as food science, animal science, plant science, advanced biology, business and economics, education, and communication. This program prepares students for variety of career interests.

**Human Biology, Health, and Society**, College of Human Ecology: established in 1997, this program gives students a strong foundation in biology and then explores 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 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 requirement 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 the 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. 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.

In all three undergraduate programs the 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 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 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 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 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 of their schools of interest. 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 with 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 about forty 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.

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, please write for the brochure. Graduate Study in Nutrition, available from the Director of Graduate Studies, Field of Nutrition, Cornell University, 309 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.

The course will discuss 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 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 such as 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 their requisite knowledge and skills. This course describes the many disciplines that are drawn upon in addressing human problems related to food, diet, and health. It also explores 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 material to be presented and discussed will primarily include the empirical scientific evidence presented for easy comprehension for students without nutrition training. The course will also consider 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. 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, will provide 6-8 of the lectures.

**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.

Theories, concepts, and methods from the social sciences will be used to examine food, eating, and nutrition. The course will use the food and nutrition system and the food choice process as conceptual models for examining the scope of social aspects of nutrition.

**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 1:25-4:25 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; food science principles as they apply to cooking 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. Intra-cellular 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. Not offered 1999-2000.

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**

Spring. 3 credits. Prerequisites: NS 115. S-U grades optional. T R 10:10. J-P. Habicht, M. C. Latham.

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. Not offered 2000-2001. 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 T 1:25. 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 and problem sets provide an opportunity to examine in greater depth selected topics from 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 1:25-4:25 or M W 6:30-9:30 or T R 10:10-1:10. Spring. Lec M 12:20; labs M W 1:25-4:25 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. Laboratory preregistration required in 309 MVR during preregistration. Limit 120. Lec M 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 the nutrition sciences and medicine. All major organ systems will be covered. Laboratories will emphasize location, recognition, and description of anatomical structures. Testing of physiological functions will focus on the tests with 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. Parker, B. Lewis.

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. Parker, R. Lewis.

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. Not offered 1999-2000. M W F 1:25. J. Haas, S. Robertson.

This course is concerned with the interrelationships of 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. Not offered 1999-2000. 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 abused drugs, 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 course discusses how management principles and theories apply to foodservice operations and nutrition services. The systems concept of organization is used. Emphasis is placed on leadership development, decision making/problem solving as it relates 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 uses case studies to examine the link between 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 or group of students who want to study 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 1999-2000. 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 as it relates to exercise performance. Students will learn nutritional counseling techniques for 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 in clinical settings: nutrition screening, 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 the community, state, and national level. 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 and discuss 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, as well as the major economic factors affecting food production



and supply. This course evaluates the 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 610 and biochemistry, and nutrition. Offered alternate years. W F 12:20. R. E. Austic.

The course emphasizes the dynamic aspects of protein digestion and absorption, amino acid transport, and amino acid and nitrogen metabolism and their relationships to the nutritional 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, not offered 1999–2000. X. G. Lei, G. F. Combs, Jr.

The 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 605 Nutritional Biochemistry Colloquium**

Fall and spring. 1 credit. S-U grades only. R 12:20. Nutritional Biochemistry faculty.

Nutritional biochemistry colloquium is a graduate seminar series that focuses on recent advancements in biochemical nutrition. Weekly presentations are made by faculty, postdocs and graduate students and are based on the primary literature. The presentations are followed by a discussion involving all participants.

**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 which introduces 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 the 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 are also addressed.

**NS 612 Methods of Assessing Physical Growth in Children**

Spring. 3 credits. Limited to graduate students and undergraduate 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. Will not be offered fall 2000.

K. Rasmussen.

An 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 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. Videotaped 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. 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.  
Discussion of current research on specific topics related to functional foods and nutraceuticals/phytochemicals.

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

Spring. 3 credits. Prerequisites: Biological Sciences 330 and 331, or equivalent. M W F 9:05. Not offered 1999-2000.  
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.

This course covers principles of nutritional epidemiology, impact assessment of nutrition intervention programs, and nutritional surveillance. Principles of using nutritional information in decision making are presented. 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. T R 10:10-12:05. J. Sobal.  
Social science theories and paradigms of sociology, psychology, anthropology, economics, political science, geography, and history that contribute to understanding food, eating and nutrition will be discussed to

understand how theories apply to nutrition topics, issues, and problems.

**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 invited outside 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 a conceptual framework 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. Parker, B. Lewis.  
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**

Spring. 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 on the relationships between human nutritional status and common human parasitic infections. Concentrates on malnutrition (protein-energy malnutrition, anemia) in developing countries. The 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 and advanced undergrads. Prerequisite: Chemistry 288 or 390, 302 or Chemistry 208 and Mathematics 112, or permission of instructor. S-U grades optional. Offered alternate years. T R 10:10. 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.

**NS 698 International Nutrition Seminar**

Fall and spring. No credit. No grades given. R 12:20-1:10. J-P. Habicht.  
This seminar series consists of presentations by Cornell faculty and graduate students, and by invited outside speakers. Speakers cover a range of topics relating 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 International Nutrition Program.

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 usually consists 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 the 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 read and learn how to 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 1999–2000.

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. Prof.  
Gillespie, Ardyth, Ph.D., Iowa State U. Assoc.  
Prof.  
Haas, Jere D., Ph.D., Pennsylvania State U.,  
Director and 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.  
Peltó, Gretel, Ph.D., U. Minnesota, 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, David, 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