

Division of Nutritional Sciences

Administration

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The Division

Nutritional science deals with the intricate relationship of food, nutrition, and health. At Cornell, the focal point for this broad field of study, which ranges from nutrient chemistry to world hunger, is the Division of Nutritional Sciences.

The division is affiliated with both the College of Human Ecology and the College of Agriculture and Life Sciences, and brings together specialists from many disciplines in the biological and social sciences. Their work covers undergraduate and graduate teaching, nutrition research, and public education, including Cooperative Extension services.

The faculty in the division are working toward two closely related goals: increasing our knowledge of nutrition and health, and applying what we know to people's everyday problems. This approach carries over to undergraduate education. Students who major in nutritional sciences learn how to interpret basic research from the laboratory and from the social sciences. They also come to understand the practical implications of their studies. Many students have the chance to test out their ideas by conducting a research project or working in the community.

Facilities

Most of the faculty of the division work in Savage Hall and Martha Van Rensselaer Hall. In addition to housing offices, classrooms, and seminar rooms, these buildings contain animal-care and research facilities, specialized laboratories, a human metabolic research unit, and interactive terminals for the University's computer system.

Savage Hall also has a graduate reading library, and in Martha Van Rensselaer Hall the division has set up the Learning Resources Center, which many undergraduates use for individual study and small group discussions. The Learning Resources Center contains class materials, audiovisual aids, and supplementary books and periodicals for independent study and special projects in nutrition.

The Major

The B.S. degree program with a major in nutritional sciences (NS) offers five major emphases, but all of

them give students a thorough foundation in the basic sciences, the field of nutrition, and communication skills. Graduates are qualified for a variety of entry-level positions in laboratory research, consumer affairs, nutrition education, and clinical and public-health services. All students are well prepared to pursue dietetic training or advanced study in fields such as nutrition, food science, biomedical sciences, and public policy.

Most undergraduates who major in nutritional sciences enroll in the College of Human Ecology. Students in the College of Agriculture and Life Sciences can also pursue a nutritional sciences emphasis through the General Studies Program, and students in the College of Arts and Sciences can take a nutrition concentration as an independent option in the Division of Biological Sciences. Nutrition courses can be used to meet graduation requirements in all three colleges.

Academic Advising

Every student majoring in nutritional sciences is assigned a faculty adviser from the division. An effort is made to match interests, and students may change advisers at any time if their goals and interests change.

Advising clinics to help students plan their programs are held each semester during course registration, and regular student-adviser conferences are required at least twice a year. The adviser not only helps students select courses, but can often suggest opportunities for individual study or experience outside the classroom.

The specific course requirements for graduation and for each major emphasis are listed in the Human Ecology *Student Guide*, available on request. Questions about undergraduate study should be addressed to Marjorie Devine, associate director for academic affairs, 334 Martha Van Rensselaer Hall.

The Core Curriculum

In their freshman and sophomore years, all undergraduates majoring in NS follow a core curriculum that builds the foundation for any aspect of advanced study in nutrition. The core curriculum includes courses in food and nutrition, laboratory skills, humanities and communications, introductory social sciences, and basic sciences. There is some choice of science courses, but all nutrition students need a good background in general and organic chemistry, biochemistry, microbiology, physiology, and mathematics.

Transfer students need to pay particular attention to the core curriculum and may need to take an extra semester to fulfill all of the basic requirements, especially in the sciences. The course NS 300, Special Studies for Undergraduates, which allows students to take "pieces" of courses, helps transfer students integrate their previous training into the requirements for the NS major without duplicating course work.

By their junior year, students start taking the more specialized courses required for the NS emphasis they choose: foods, consumer food and nutrition, community nutrition, clinical nutrition, or nutritional biochemistry. The core curriculum ensures that they can move into any emphasis or change emphases.

Emphases

Foods. Students who elect this emphasis concentrate on basic and applied science courses, including physiochemical aspects of food and

experimental methods. They study the composition and treatment of food and how these affect food quality, safety, acceptability, and nutritive value.

Consumer food and nutrition. This emphasis prepares students to apply the nutritional and food sciences to consumers' questions about food quality, safety, cost, and nutritive value. Course work in communications, economics, government, public policy, and marketing is added to the nutritional sciences core.

Community nutrition. This emphasis gives students the skills to help people translate nutrition knowledge into action. It provides a strong background in basic and nutritional sciences but also includes supporting courses in the social sciences and communications. Practical experience through supervised field study is strongly recommended.

Clinical nutrition. This emphasis builds on the basic science core to form a solid foundation in the biological aspects of human nutrition. The program stresses courses and laboratory work in biological science and physiology and is designed for students interested in pursuing advanced study in human nutrition or medicine.

Nutritional biochemistry. This science-oriented curriculum prepares students for advanced study in the nutritional and biomedical sciences. Courses and laboratory work in chemistry, biochemistry, and physiology help develop a thorough understanding of nutrient action at the molecular level. Students who have a broad interest in the scientific basis of food and nutrition may decide to concentrate in this area.

Dietetics

Students interested in applied nutrition should consider planning their course work to meet the requirements for membership and registration in the American Dietetic Association (ADA). Courses and electives that will meet all five NS major emphases can fulfill the ADA's basic and specialized academic requirements as well. Students are then eligible to pursue the remaining ADA requirements after graduation: the experience component or internship required for membership and for registration, and the national certifying examination required for a registered dietitian.

Advisers in the division will help students plan their course work to meet the ADA's academic requirements and will counsel them on applying for internships. Additional information on the dietetics program at Cornell can be obtained from Rose Marie Holmes, 314 Martha Van Rensselaer Hall, and Joan M. L. Koch, 373 Martha Van Rensselaer Hall.

Field Study Program

Structured field experience in a community agency or health-care facility can be taken for credit in several ways: through an independent study course, as a class project, or as a summer study project. Interested students should consult Nancy Peckenpaugh, the division's field-study coordinator, or Shiriki Kumanyika, assistant professor of community nutrition.

Independent Study

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 Dr. Devine, or consider applying to the honors program.

Honors Program

The honors program, leading to a B.S. degree with honors in nutritional sciences, gives official recognition to students who have demonstrated excellence in their academic work and their capacity for independent study.

In addition to fulfilling the requirements for a major emphasis in nutritional sciences, students in the honors program take courses on 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, contact Mary A. Morrison, honors chairperson, N-205A Martha Van Rensselaer Hall.

Courses Recommended for Nonmajors

Courses in nutritional science can strengthen programs of study in biological science, medicine, agriculture, food-science, human services, and other fields.

Introductory courses in nutrition (NS 115) and food (NS 146) are open to all students, as are some special interest courses (NS 222, Maternal and Child Nutrition; NS 325, Sociocultural Aspects of Food and Nutrition; NS 346, Consumer Food Issues; and NS 457, National and International Food Economics).

Nonmajors who have taken college courses in chemistry, biological sciences, and nutritional sciences may elect advanced food and nutrition courses, with the permission of the instructor.

Graduate Programs

Graduate study is administered by the Field of Nutrition, a group of more than 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 major in animal nutrition, human nutrition, international nutrition, nutritional biochemistry, foods, or general nutrition. A professional Master of Nutritional Science (M.N.S.) degree in clinical nutrition combines academic study and research on campus with clinical training at affiliated institutions in Upstate New York and New York City. Field experience is also a component of concentrations in community nutrition, 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, write for the brochure *Graduate Study in Nutrition*, available from the Graduate Faculty Representative, Field of Nutrition, Cornell University, Savage Hall, Ithaca, New York 14853.

Nutritional Sciences Courses

115 Ecology of Human Nutrition and Food Fall and spring. 3 credits. Prerequisites: fall, high school biology (juniors and seniors with advanced biological science background must have permission of the instructor); spring, a one-semester college biology course or permission of the instructor. S-U grades optional. Cost of handouts and pamphlets, \$3.

Fall: M W F 9:05. Spring: M W F 11:15. Four discs scheduled in place of some lects. Evening prelims to be arranged. M. Devine.

An introduction to the field of human nutrition and food. Includes study of human nutritional needs; problems encountered in providing food to meet nutritional needs; relationships among physiological needs, sociocultural systems, food, and the significance of these relationships to health. Discussion of current issues such as vegetarianism, weight control, and dietary goals is included.

146 Introductory Foods Fall and spring. 3 credits. Each section limited to 16 students. Prerequisite: NS 115 or concurrent registration. Permission of instructor during course registration required (permission-of-instructor forms must be obtained from, and returned to, 335 Martha Van Rensselaer Hall). Cost of handouts, \$2.

Fall: lec, M 12:20; labs, T R 10:10–12:05 or 2:30–4:25. Spring: lec, M 12:20; labs, T R 10:10–12:05 or T R 2:30–4:25. M. Pimentel.

Criteria for evaluating the practice of the science of food and nutrition. Lab includes an introduction to the physicochemical properties of food and the relationship of these properties to preparation, techniques, and food quality. Meal preparation, focusing on human nutritional needs and the management of money and time, is included.

222 Maternal and Child Nutrition Spring. 3 credits. Prerequisites: NS 115 and a college biology course. S-U grades optional.

M W F 11:15. V. Utermohlen. Involves a study of the nutritional requirements in pregnancy, lactation, and 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.

246 Introduction to Physicochemical Aspects of Food Fall or spring. 4 credits. Each section limited to 18 students. Prerequisites: a college course in organic chemistry or biochemistry, NS 146, and permission of instructor during course registration (permission-of-instructor forms must be obtained from, and returned to, 335 Martha Van Rensselaer Hall). S-U grades optional.

Lecs, T R 9:05; labs, T R 10:10–12:35 or M W 2–4:25. Fall: B. Lewis. Spring: R. Parker. A study of (a) the colligative properties of solutions; (b) colloidal systems—sols, gels, foams, and emulsions; (c) physical and chemical properties of the major groups of foods, the effect of basic methods of food preparation and preservation on these properties, and their relation to food quality—especially color, flavor, and texture. Labs introduce the experimental study of food and illustrate the function of ingredients and effect of treatment on food quality.

300 Special Studies for Undergraduates Fall or spring. 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 forms available from the Counseling Office, N105 Martha Van Rensselaer Hall. 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.

301 (also Food Science 301) Nutritional Aspects of Raw and Processed Foods Spring. 3 credits. Prerequisite: NS 115 and organic chemistry or permission of the instructor.

M W F 9:05. D. Miller.

An evaluation of the nutritional qualities of human foods with emphasis on changes that occur during processing and storage. Topics include criteria and methods for nutritional evaluations of foods, factors that may affect nutrient loss, descriptions of the composition and nutritional role of selected commodities, food fortification, food additives, fabricated foods, fast foods, and minimally processed foods.

302 Orientation to Field Study In Extension

Fall. 2 credits. Limited to 10 juniors and seniors. Prerequisites: NS 115, 146, and permission of instructor. S-U grades only.

F 12:20–2:20; field trips to nearby counties are arranged as student schedules permit. R. Klippstein.

The selection and preparation of appropriate food and nutrition information for specific lay audiences. Participants complete an individual project using two different mass-medium teaching tools. When appropriate, the project is taught to established county audiences. The major project is a group project presenting programs to a scheduled extension audience. Additional experiences include a field visit to a county extension office and review of extension organization and resources. Understanding the needs of audiences, informal teaching techniques, and self-critiquing and group critiquing are stressed.

325 Sociocultural Aspects of Food and Nutrition

Fall. 3 credits. Limited to juniors and seniors. Prerequisites: NS 115 and a college course in anthropology or sociology.

M W F 2:30. D. Sanjur.

The course offers a cross-cultural perspective for understanding the environmental and sociocultural parameters affecting the development of food consumption patterns. Emphasis is on theories on formation of food habits, dietary methodologies, ethnicity and food habits, and educational programs in nutrition, in national and international contexts.

331 Physiological and Biochemical Bases of Human Nutrition Spring. 3 credits. Prerequisites: Biological Sciences 330 or 331 and NS 115 or equivalent. S-U grades optional.

M W F 10:10. M. C. Nesheim, T. C. Campbell.

The biochemical and physiological bases for human nutrition requirements, including digestion and absorption, energy metabolism, food intake regulation, protein amino acids, minerals, vitamins, and determination of nutritional status.

332 Laboratory Methods in Nutritional Sciences

Fall and spring. 3 credits. Each section limited to 18 students. Prerequisites: NS 331 or concurrent registration and permission of instructor during course registration (permission-of-instructor forms must be obtained from, and returned to, 335 Martha Van Rensselaer Hall).

Lec, M 12:20; labs, M W 1:25–4 or T R 1:25–4.

M. Stipanuk.

Introduction to principles and procedures of experimental design, analytical techniques, and data analysis in human nutrition. Emphasis on methods of analysis of nutrients and metabolites in food, tissues, and body fluids. Application of these methods in assessing physiological and biochemical responses to alterations of nutrient intake in animal and human studies.

346 Consumer Food Issues Fall. 2 credits.

Limited to 30 juniors and seniors. Prerequisites: NS 115 and 146 or permission of instructor. S-U grades optional.

T R 12:20. P. Thonney.

An examination of selected consumer issues related to the availability, safety, and quality of food. Current legislative and regulatory proposals will be investigated in terms of relevant research and potential impact on consumers and the food supply.

347 (also HDFS 347) Human Growth and Development: Biological and Social Psychological Considerations Spring. 3 credits. Prerequisites:

Biological Sciences 101 or 109 or equivalent; HDFS 115 or Psychology 101 and NS 115 or equivalent.
M W F 1:25. J. Haas, H. Ricciuti.

A review of major patterns of physical growth from the fetal period through adolescence, with consideration of biological and socioenvironmental determinants of growth, as well as physical and psychological consequences of variations in growth patterns. An examination of normal patterns of growth is followed by an analysis of major sources of variations in growth (normal and atypical).

361 (also Psychology 361) Biochemistry and Human Behavior Fall. 3 credits. Prerequisites:

Biological Sciences 101–102, Chemistry 103–104, Psychology 123, or permission of instructor. A fundamental knowledge of human biology and chemistry is essential. S-U grades optional.
M W F 11:15. D. Levitsky.

A survey of the scientific literature on the role of brain and body biochemical changes as determinants of human behavior. The topics covered include action and effects of psychopharmacologic agents, biochemical determinants of mental retardation, biochemical theories of psychosis, and effects of nutrition on behavior.

378 Management Principles in Foodservice Operation Spring. 4 credits. Prerequisites: NS 246

and Agricultural Economics 220, or Hotel Administration 211 or I&LR 121 or I&LR 151 or I&LR 363 or equivalent, or permission of instructor. S-U grades optional. Estimated cost, \$5.
T R 10:10–12:05. R. Holmes.

Application of management principles to foodservice operations involved in the production, distribution, and service of quality food in quantity. Includes menu planning, foodservice layout and design, production and service controls, purchasing, food-cost control, personnel management, sanitation, and safety.

398 Honors in Nutritional Sciences Fall. 1 credit.

Limited to students admitted to the division honors program. S-U grades only.

T 2:30. M. Morrison, coordinator.

Research design. Analysis of research papers on selected topics.

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 forms to be signed by the instructor directing the study and the associate director of academic affairs. The forms, available from the Counseling Office, are filed at course registration or within the change-of-registration period. 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 of academic affairs as early as possible.

400 Directed Readings For study that

predominantly involves library research and independent reading.

401 Empirical Research For study that

predominantly involves data collection and analysis or laboratory or studio projects.

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.

403 Teaching Apprenticeship For study that includes assisting faculty with instruction.

415 Field-Based Learning in Nutrition Fall, spring, and summer. 2–6 credits. S-U grades optional. Prerequisites: junior, senior, or graduate standing; 9 hours of coursework in DNS; previous or concurrent registration in ID 100 or equivalent experience. Obtain applications in DNS Undergraduate Office (335 MVR).

Hours in placement arranged individually; biweekly seminar to be announced. N. Peckenpaugh, coordinator.

Undergraduate and graduate students are placed, according to their interests and backgrounds, in community organizations and agencies that provide nutrition and food services. Placements are individually designed to enable students to apply nutrition concepts learned in the classroom. A biweekly seminar provides a basis for sharing of experiences among students and for integration of theory and practice. Students may be required to provide their own transportation to placements.

441 Nutrition and Disease Fall. 4 credits.

Prerequisites: NS 331 and a human physiology course. S-U grades optional. Cost of handouts and pamphlets, \$5.

M W F 10:10 and F 8. V. Utermohlen.

Study of the physiologic and metabolic anomalies in chronic and acute illnesses and the principles of nutritional therapy and prevention. The topics covered are diabetes mellitus, starvation, obesity, nutritional assessment, nutritional pharmacology, severe injury, infection, cancer, gastrointestinal diseases, liver disorders, renal diseases, cardiovascular diseases, and pediatrics. Original research papers, books, review papers, and publications of professional organizations are used throughout the course.

442 Diet Formulation and Analysis Fall. 2 credits.

Prerequisites: NS 146, concurrent registration in NS 441 (or equivalent background in either course), and permission of instructor during course registration. (Permission-of-instructor forms must be obtained from, and returned to, 335 Martha Van Rensselaer Hall.) Limited enrollment. S-U grades optional. Cost of handouts, pamphlets, and brochures, \$5.

Lec, M 11:15; lab, M 2:30–4:25 or T 11:15–1:10.

Evening prelims to be arranged.

Development of skills in formulation and analysis of therapeutic dietary regimes. Various sources of information on food composition, diet planning, and enteral and parenteral nutrition supplements are used.

445 Community Nutrition and Health Spring.

3 credits. Prerequisites: NS 331 or concurrent enrollment in 331. Recommended: NS 325. S-U grades optional. The field-project component of this course may involve off-campus activity; students are responsible for their own transportation or bus fare.
Lec-discs, M W 11:15; fieldwork lab, W 2:30–4:30.
S. Kumanyika.

Study of human nutrition and health problems from a community perspective; programs and policies related to nutrition at local, state, and federal levels; and approaches and techniques of effective application and dissemination of nutrition knowledge in communities.

446 Physiochemical Aspects of Food Fall.

3 credits. Prerequisites: NS 246 and a college course in biochemistry, which may be taken concurrently. S-U grades optional.

M W F 9:05. G. Armbruster.

The relation of food quality to (a) rheological properties of food systems, (b) oxidation and reduction reactions, and (c) enzymatic and nonenzymatic browning. Covers physical and chemical factors accounting for the color, flavor, and texture of natural and processed foods.

447 Physiochemical Aspects of Food—

Laboratory Fall. 1 credit. Limited to 16 students. Prerequisite: NS 446 or concurrent registration. S-U grades optional.

T 1:25–4:25. G. Armbruster.

Laboratory experiments designed to illustrate the effect of varying ingredients and treatment on the quality of food products. Objective testing methods are used to determine food quality characteristics.

448 Physiochemical Aspects of Food—

Laboratory Fall. 1 credit. Limited to 16 students. Prerequisite: NS 446 or concurrent registration. S-U grades optional.

R 1:25–4:25. G. Armbruster.

Laboratory experiments designed to illustrate (a) the physiochemical behavior of colloidal systems, (b) chemical reactions of some food components, and (c) effects of temperature, pH, moisture, inorganic salts, and enzymes on physiochemical changes in natural foods, food components, and food mixtures.

456 Experimental Foods Methods Spring.

3 credits. Limited to 16 students. Prerequisites: NS 446 and 448. Recommended: a course in statistics.

Labs, T R 1:25–4:25. G. Armbruster.

Application of the scientific method in the design and performance of experimental food problems and the interpretation and evaluation of results. Evaluation of the use of instruments and chemical and sensory methods in the measurement of food properties. Independent problems.

457 National and International Food Economics

Spring. 3 credits. Prerequisites: college course in economics and junior standing or permission of instructor. S-U grades optional.

M W F 9:05. E. Thorbecke.

Examination of individual components essential for an understanding of the United States and world food economics. Analysis of the world food economy. Review and analysis of (a) the major economic factors determining the demand for food, the composition of food consumption, and nutritional intake; and (b) the major economic factors affecting food production and supply. Examination and evaluation of the effectiveness of various food policies and programs in altering food consumption patterns. Principles of nutritional planning in developing countries within the context of the process of economic and social development.

488 Applied Dietetics In Foodservice Systems

Fall and spring. 3 credits. Limited to 30 students. Prerequisite or corequisite: NS 378, Micro 290, 291, a course in learning theory, and permission of the instructor during course registration (permission-of-instructor forms must be obtained from, and returned to, 335 Martha Van Rensselaer Hall). S-U grades optional. Estimated cost, \$5. Uniform required.

Lec, T 8–9:55; lab, 1 section, M T W R or F 2:30–7; possible field trip. J. M. L. Koch.

Some laboratories will be arranged through Cornell Dining. Other experiences may be possible in community foodservice operations. Students will gain experience in care and use of institutional equipment, job analysis, volume food production, applied sanitation, in-service training, as well as other management skills required to operate a foodservice program.

498 Honors in Nutritional Sciences Spring.

1 credit. Limited to students admitted to the Division Honors Program. Students may register in NS 499 concurrently.

T 9:05. M. Morrison, coordinator.

Informal presentation and discussion of current topics in food and nutrition in which all members participate. Written reports on topics discussed may be requested. Delineation of honors research problems in consultation with faculty adviser.

499 Honors Problem Fall and spring. Credits to be arranged. Open only to students in the Division Honors Program.

Hours to be arranged. Division faculty; M. Morrison, coordinator.

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

600 Special Problems for Graduate Students Fall or spring. Credit to be arranged. Limited to graduate students recommended by their chairperson and approved by the instructor in charge. S-U grades optional.

Hours to be arranged. Division faculty. Emphasis on independent, advanced work. Experience in research laboratories in the division may be arranged.

601–604 Advanced Nutrition Series A series of nutrition courses offered jointly by the Division of Nutritional Sciences and the Departments of Animal Science and Poultry Science. Prerequisites: courses in nutrition, physiology, and biochemistry, including intermediary metabolism, or permission of instructor.

601 (also Animal Science 601) Proteins and Amino Acids in Nutrition Fall. 2 credits.

W F 11:15. R. E. Austic, M. A. Morrison. Amino acid and protein nutrition with emphasis on the dynamic aspects of protein digestion, amino acid absorption, protein synthesis, amino acid metabolism, and nitrogen excretion. Discussion includes current topics of protein and amino acid nutrition, protein-energy interrelationships, amino acid and protein requirements, bioavailability of amino acids, and evaluation of protein quality. Emphasis is on basic principles and their applications to animal and human nutrition.

602 Lipids Fall. 2 credits.

T R 11:15. A. Bensadoun. Advanced course on biochemical, metabolic, and nutritional aspects of lipids. Emphasis is on critical analysis of current topics of lipid methodology, lipid absorption, lipoprotein secretion, structure, and catabolism; mechanisms of hormonal regulation of lipolysis and fatty acid synthesis; and cholesterol metabolism and atherosclerosis.

604 The Vitamins Fall. 2 credits.

T R 10:10. G. F. Combs, Jr. Lectures on nutritional aspects of the vitamins, including recent developments in nutritional and biochemical interrelationships with other nutrients and metabolites.

606 Carbohydrate Chemistry Spring. 2 credits. Prerequisite: organic chemistry. Recommended: biochemistry. S-U grades optional.

T R 11:15. B. A. Lewis. The chemistry and physicochemical properties of simple carbohydrates, polysaccharides, and their complexes with lipids, proteins, and inorganic ions. The functional role of the carbohydrates in food systems and their nutritional implications will be discussed as well as applications of carbohydrates in food processing.

[611 Molecular Toxicology Spring. 2 credits.

Prerequisite: full-year 400-level course in biochemistry or equivalent. S-U grades optional. Offered alternate years. Not offered 1982–83.

T R 11:15. C. Wilkinson, C. Campbell, A. Aronson, and others. 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.]

612 Methods of Assessing Physical Growth in Children Spring. 2 credits. Limited to graduate students and students who have permission of the instructor. S-U grades optional.

Lec. T 1:25; labs, T R 1:25–4:25. J. Haas. A lab course to train students in methods and techniques used to assess the physical growth and development of growing children. The methods explored are those applicable for field or community studies and cover anthropometry, body composition, skeletal age, maturity indicators, physical fitness, and physiological responses to environmental stress.

[613 (also Psychology 613) Obesity and the Regulation of Body Weight Spring. 3 credits.

Limited to 30 students. Prerequisites: one course in psychology, one course in nutrition. Undergraduate students may register with permission of the instructor. S-U grades optional. Offered alternate years. Not offered 1982–83.

M W F 11:15. 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.]

614 Topics in Maternal and Child Nutrition Fall. 3 credits. Prerequisites: NS 331, 222 or 347, BS 311, and permission of the instructor.

T R 9:05–10:30. 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.

616 Readings in Food Fall. 2 credits. Prerequisite: organic chemistry. Recommended: biochemistry. S-U grades optional. May be repeated for credit with permission of instructor.

M 7:30–9:25 p.m. N. Mondy. Critical review of selected topics in the current literature. Emphasis on experimental data and basic scientific principles underlying modern theory and practice relative to food quality. Training in oral and written presentations of scientific reports.

617 Teaching Seminar First half of semester during fall or spring. 1 credit. Limited to division graduate students and students who have permission of the instructor. S-U grades only.

W 7:30–9:30 p.m. M. Devine, N. Yaghlian. A series of workshops focusing on development of teaching skills for guiding classroom learning in lecture, discussion, and lab 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.

618 Teaching Experience Fall or spring. Noncredit. Limited to division graduate students and students who have permission of the instructor.

Hours to be arranged. Division faculty; M. Devine, coordinator. 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.

619 (also Animal Science 619) Field of Nutrition Seminar Fall or spring. Noncredit. S-U grades only.

M 4:30. Faculty and guest lecturers. Lectures on current research in nutrition.

625 Seminar in Food Habits Research Fall. 3 credits. Limited to 12 graduate students.

Prerequisite: statistics or research design course. Offered alternate years. W F 3:35. D. Sanjur. Emphasizes a critical review of the literature and development of a research proposal using sociological theories and techniques as applied to nutritional data.

626 Special Topics in Food Spring. 2 credits.

Hours to be arranged. G. Armbruster and B. A. Lewis. Current research related to food is reviewed in the context of basic principles and their application to the quality of food.

627 Special Topics in Food Spring. 2 credits.

Prerequisite: organic chemistry. Recommended: biochemistry. S-U grades optional. May be repeated for credit with permission of instructor. W 7:30–9:25 p.m. N. Mondy. Current research related to food production and processing, as well as toxicants in the food chain will be reviewed. May be repeated for credit with permission of the instructor.

630–633 Advanced Nutrition Laboratory Spring. 1–5 credits. Limited to 12 students.

T R 2:15–5:15. Division faculty. Study of the anthropometric, dietary, clinical, and biochemical assessment of human nutritional status. The individual courses are taught in sequence over the entire semester. Any or all of the modules may be taken for credit.

630 Anthropometric Assessment 1 credit.

Prerequisites: NS 331 or equivalent and permission of instructor. J. Haas. Study of methods and procedures for anthropometric, radiographic, and energetic assessment of children and adults in clinical, research, and survey settings.

631 Dietary Assessment 1 credit. Prerequisites: statistics and NS 331 or equivalent, and permission of instructor.

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

632 Clinical Assessment 1 credit. Prerequisites: NS 630, 631, 441, Biological Sciences 330 or 331, either NS 332 or Biological Sciences 430, and permission of instructor.

V. Utermohlen and division faculty. Study of methods and techniques for clinical assessment of nutritional status and diagnosis of nutritional disorders.

633 Biochemical Assessment Weeks 9–14; interested students must enroll with the instructor during the first 2 weeks of the term. 2 credits.

Prerequisites: NS 331, Biological Sciences 330 or 331, either NS 332 or Biological Sciences 430, a course in human physiology, and permission of instructor. M. N. Kazarinoff and division faculty. Biochemical assessment of nutritional status. Experiments are selected to exemplify measurements of intake, use, and output of primary nutrients and their metabolites.

[634 (also Biological Sciences 634) Vitamins and Coenzymes Spring. 2 credits. Prerequisites: organic chemistry 253 or 357–358 and Biological Sciences 331 or 330, or their equivalents in biochemistry. Offered alternate years. Not offered 1982–83.

T R 10:10. M. N. Kazarinoff.
The chemical, biochemical, and nutritional aspects of the vitamins and coenzymes.]

635 (also Biological Sciences 635) Enzymology and Metabolic Regulation Spring. 2 credits.

Prerequisites: Chemistry 357–358 and either Biological Sciences 330 or 331 or permission of the instructor. Recommended: physical chemistry.

T R 9:05. Division faculty.
Lectures only. The study of enzymes and the molecular mechanisms of metabolic regulation.

636 (also Biological Sciences 637) Integration and Coordination of Energy Metabolism Fall. 3 credits.

Prerequisites: Biological Sciences 330 and 331, or equivalent.

M W F 9:05. W. J. Arion and staff. Evening prelims, hours to be arranged.

The elements and dynamics of energy metabolism in higher animals are systematically developed through biochemical characterizations of the metabolic components and structure of major tissues and organs, stressing correlations with physiologic functions. Mechanisms that control energy metabolism within individual tissues and coordinate these processes in the intact animal are analyzed in the contexts of selected physiologic and pathologic stresses.

637 Epidemiology of Nutrition Fall. 2 credits.

Limited to graduate students. Prerequisites: Statistics and Biometry 602 or 604 or equivalent; NS 331, 441, 601, 603, 630, and 631, or equivalent; and permission of instructor. S-U grades optional.

Hours to be arranged. J-P. Habicht.
In the context of designing and evaluating population interventions to improve protein-calorie nutrition, students review past evidence of effectiveness and efficiency of intervention, attempt to quantify sensitivity and specificity of outcome measures, and design methods to improve interventions and evaluations.

638 Epidemiology of Nutrition Spring. 2 credits.

Limited to graduate students. Prerequisites: Statistics and Biometry 602 or 604 or equivalent; NS 331, 441, 601, 603, 630, and 631, or equivalent, and permission of instructor. S-U grades optional.

Hours to be arranged. J-P. Habicht.
In the context of designing national nutrition surveillance, students review principles underlying surveillance, prerequisites of indicators, and current surveillance proposals to identify strengths and weaknesses. The role of evaluation of programs in nutrition surveillance also is reviewed.

645 Seminar on United States Nutritional Services and Programs Spring. 2 credits. Limited to graduate students with a major or minor in human nutrition. S-U grades optional.

M W F 11:15. S. Kumanyika.
Participants attend two NS 445 lectures and a seminar hour where they are guided in the study and discussion of United States food and nutrition programs, and community settings for delivery of nutrition and health services. Participants will be responsible for preparing and presenting relevant material in class.

646 Seminar in Physicochemical Aspects of Food Spring. 3 credits. Prerequisite: a college course in organic chemistry or biochemistry. S-U grades optional.

T R 9:05; disc to be arranged.
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 246 as a basis for supplementary readings and critical review of research on selected topics.

649 Geriatric Nutrition Spring. 3 credits.

Prerequisite: NS 331. Letter grade only.
M W F 10:10, plus 20 hours during the semester, working with elderly individuals in the Ithaca area.

D. Roe.
Emphasis is given to effects of aging, particularly as these change food habits, alter digestive processes, or decrease nutrient utilization. Causes of nutrient overload and nutritional deficiency are described. Nutritional assessment of elderly people is explained, together with precautions that must be taken in interpreting findings. Consideration is given to geriatric nutrition as a major responsibility of nutritionists working in hospitals, extended-care facilities, and community programs. Therapeutic aims considered are the provision of nutritional rehabilitation in acute-care hospitals and specific diet therapy for chronic-disease patients. Community program objectives are discussed, including establishment and maintenance of feeding programs for the elderly.

650 Clinical and Public Health Nutrition Spring. 3 credits. For graduate students with a major or minor in nutrition and undergraduate nutrition majors in their senior year. Prerequisite: NS 331 or equivalent.

M W F 9:05. D. Roe.
Lectures cover social, environmental, and disease variables that influence the nutrition of infants, children, and adults. Endemic nutritional problems (such as obesity, dental caries, and anemias) of public health importance in the United States are discussed. Student presentations are made in class. Limited field experience is offered.

651 Nutrition and the Chemical Environment

Fall. 3 credits. Prerequisite: NS 331 or equivalent. S-U grades optional.

M W F 11:15. D. Roe.
The relationship between nutrition and the effects of foreign chemicals. Students are offered an overall view of compounds to which we are exposed, including natural food toxicants, food additives, water pollutants, pesticide residues, and radioactive wastes, as well as medications and illegal drugs. A factual and scientific background is developed so students can interpret information and misinformation circulated in the news media.

652 Nutrition Counseling Spring. Meets 2½ hours during each of the first 11 weeks of the semester.

2 credits. Limited to students in the Clinical Nutrition Program. Prerequisites: NS 441, 442, and permission of instructor. S-U grades only.

Hours to be arranged. C. Lanciault.
Principles and procedures of nutritional counseling in clinical practice. Emphasis on subject matter and process skills necessary to develop, implement, and evaluate nutritional care plans for individuals and groups. Includes workshops, simulation techniques, and work with clients in selected settings.

659 (also Veterinary Medicine 759) The Nutrition and Physiology of Mineral Elements Fall.

2 credits. Prerequisites: basic physiology, intermediate biochemistry, and general nutrition. Offered alternate years.

T R 8. R. Schwartz, D. VanCampen, R. Wasserman.
Lectures on nutritional aspects and physiological, biochemical, and hormonal relationships of the prominent macro- and microelements, with emphasis on recent developments. Included is information on methodologies of mineral research and the chemistry of ions and complexes as well as essentiality, requirements, transport, functions, homeostasis, interrelationship, and toxicity of various mineral elements.

660 Special Topics in Nutrition Fall or spring.

3 credits maximum each term. Registration by permission of the instructor.

Hours to be arranged. Division faculty.
Designed for the student who wants 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.

669 Field Seminar Spring; offered during January intersession or immediately following final examinations spring semester. 1 credit. Limited to 12 students. Required for graduate students in clinical nutrition. Open to other graduate students in nutrition with permission of instructor.

J. Rivers, M. Devine, R. Holmes.
Overview of policy decision making and implementation of nutrition programs at the state and national levels. Seminars alternate between Washington, D.C., (even years) and Albany, N.Y., (odd years). Provides opportunities to meet and confer with staff members of selected governmental and private agencies. Upon return to campus, an integrated summary report is required prior to group discussion.

670 Clinical Field Studies Fall, spring, summer.

15 credits maximum. Limited to graduate students in clinical nutrition. Prerequisites: NS 441, 442, 652, 630, 631, 632, and 633. S-U grades only.

Full-time study at off-campus clinical sites.
C. Lanciault, R. Holmes, V. Utermohlen, J. Rivers.
The delivery of nutritional care in hospitals, outpatient clinics, and community settings.

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.

690 (also Psychology 690) Seminar on Nutrition and Behavior Spring. 3 credits. Limited to 25 students. Prerequisite: a course in psychology and NS 361 and permission of the instructor. S-U grades optional. Offered alternate years.

T R 10:10–11:25. D. Levitsky.
The seminar this year covers several current topics in nutrition and behavior. These topics include early nutritional insult and mental development, malnutrition and behavior, nutrition and learning, food additives and hyperkinesis, megavitamin therapy, inborn metabolic defects and mental illness, nutrition and depression, and hypoglycemia.

695 Seminar in International Nutrition and Development Policy Spring. 2 credits. Prerequisite: NS 680 or equivalent. S-U grades optional.

Hours to be announced. M. Latham and division faculty.
The role of nutrition in national development. Emphasis is on the interdisciplinary nature of the programs and policies needed to solve the food and nutrition problems of low-income countries and communities. Planning of programs and evaluation of alternate strategies designed to improve nutrition are discussed, using examples from particular countries.

699 Special Topics in International Nutrition

Fall and spring. 3 credits maximum each term. Registration by permission of the instructor. International nutrition faculty.

This option is designed for the graduate student who wants to become familiar with some specific topic related to international nutrition. The instruction usually consists of individual tutorial study involving extensive use of existing literature. In certain semesters it may consist of a lecture or seminar course on a subject such as nutrition and parasitology or the nutritional problems of some geographic region. On occasions it may involve laboratory or field studies. Because the topics may change, this course may be repeated for credit.

702 Seminar in Nutritional Toxicology Fall or spring. No credit. S-U grades only.
M 12:20. T. C. Campbell, C. F. Wilkinson.
One-half of meetings on general topics in toxicology, with the other half on nutrition and cancer. The toxicology seminar program will cover varied topics in biochemical, genetic, nutritional, and veterinary toxicology and includes basic research studies as well as concepts and research activities on environmental problems of a toxicological nature. The nutrition-and-cancer seminar program includes presentations by off-campus speakers addressing fundamental concepts of chemical carcinogenesis and the role of dietary and nutritional modification of the carcinogenesis process.

703 Seminar in Nutritional Science Fall or spring. 1 credit. S-U grades only.
T 12:20 or W 12:20. Division faculty.

899 Master's Thesis and Research Fall or spring. Credit to be arranged. Prerequisite: permission of the chairperson of the graduate committee and the instructor. S-U grades optional.
Hours to be arranged. Division graduate faculty.

999 Doctoral Thesis and Research Fall or spring. Credit to be arranged. Prerequisite: permission of the chairperson of the graduate committee and the instructor. S-U grades optional.
Hours to be arranged. Division graduate faculty.

Utermohlen, Virginia, M.D., Columbia U. Assoc. Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology
Wright, Lemuel D., Ph.D., Oregon State Coll. Prof. Emeritus
Zilversmit, Donald B., Ph.D., U. of California. Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology

Joint Appointees

Apgar, B. Jean, Visiting Asst. Prof., U.S. Plant, Soil, and Nutrition Laboratory/Nutritional Sciences
Austic, Richard E., Assoc. Prof., Poultry Science/Nutritional Sciences
Bauman, Dale, Assoc. Prof., Animal Science/Nutritional Sciences
Combs, Gerald F., Jr., Assoc. Prof., Poultry Science/Nutritional Sciences
Krook, Lennart P., Prof., New York State College of Veterinary Medicine/Nutritional Sciences
Miller, Dennis, Asst. Prof., Food Science/Nutritional Sciences
VanCampen, Darrell R., Assoc. Prof., U.S. Plant, Soil, and Nutrition Laboratory/Nutritional Sciences
VanSoest, Peter J., Prof., Animal Science/Nutritional Sciences
Warner, Richard G., Prof., Animal Science/Nutritional Sciences
Wasserman, Robert H., Prof., New York State College of Veterinary Medicine/Nutritional Sciences
Young, Robert J., Prof., Animal Science/Nutritional Sciences

Faculty Roster

Arion, William J., Ph.D., U. of N. Dakota. Prof.
Armbruster, Gertrude, Ph.D., Washington State U. Assoc. Prof.
Bensadoun, Andre, Ph.D., Cornell U. Prof., Nutritional Sciences/Physiology
Bisogni, Carole, Ph.D., Cornell U. Assoc. Prof.
Brink, Muriel S., M.S., Michigan State U. Assoc. Prof.
Campbell, T. Colin, Ph.D., Cornell U. Prof.
Cowell, Catherine, M.S., U. of Connecticut. Adjunct Prof.
Crompton, D. W. T., Ph.D., Sc.D., U. of Cambridge (England). Adjunct Prof.
Devine, Marjorie M., Ph.D., Cornell U. Prof.
Gillespie, Ardyth, Ph.D., Iowa State U. Asst. Prof.
Haas, Jere D., Ph.D., Pennsylvania State U. Assoc. Prof.
Habicht, Jean-Pierre, Ph.D., Massachusetts Inst. of Technology. James Jamison Professor of Nutritional Epidemiology
Kazarinoff, Michael N., Ph.D., Cornell U. Asst. Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology
Klippstein, Ruth N., M.S., Michigan State U. Prof.
Kumanyika, Shiriki K., Ph.D., Cornell U. Asst. Prof.
Latham, Michael C., D.T.M. & H., U. of London (England). Prof.
Levitsky, David A., Ph.D., Rutgers U. Assoc. Prof.
Lewis, Bertha A., Ph.D., U. of Minnesota. Assoc. Prof.
Mondy, Nell I., Ph.D., Cornell U. Prof.
Morrison, Mary A., Ph.D., U. of Wisconsin. Prof.
Nesheim, Malden C., Ph.D., Cornell U. Prof.
Olson, Christine M., Ph.D., U. of Wisconsin. Assoc. Prof.
Parker, Robert S., Ph.D., Oregon State University. Asst. Prof.
Riulin, Richard S., M.D., Harvard U. Adjunct Prof.
Rivers, Jerry M., Ph.D., Pennsylvania State U. Prof.
Roe, Daphne A., M.D., U. of London (England). Prof.
Sanjur, Diva M., Ph.D., Cornell U. Prof.
Schwartz, Ruth A., Ph.D., U. of London (England). Prof.
Stephenson, Lani, Ph.D., Cornell University. Visiting Asst. Prof.
Stipanuk, Martha H., Ph.D., U. of Wisconsin. Asst. Prof.
Thorbecke, Erik, Ph.D., U. of California. H.E. Babcock Professor of Economics and Food Economics