

# FSHN - FOOD SCIENCE & HUMAN NUTRITION

FSHN Class Schedule (<https://courses.illinois.edu/schedule/DEFAULT/DEFAULT/FSHN/>)

## Courses

FSHN 101 The Science of Food and How it Relates to You credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/101/>)

Discusses the evolution of the food system to meet the needs and desires of a complex, heterogeneous society. Provides an overview of food in relation to nutrition and health, composition and chemistry, microbiology, safety, processing, preservation, laws and regulations, quality, and the consumer.

This course satisfies the General Education Criteria for:

Nat Sci Tech - Phys Sciences

FSHN 120 Contemporary Nutrition credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/120/>)

Fundamental principles of human nutrition and their application to the selection of an adequate diet for health and wellness; current nutrition topics of importance. Credit is not given for FSHN 120 if credit has been given for FSHN 220.

This course satisfies the General Education Criteria for:

Nat Sci Tech - Life Sciences

FSHN 123 FSHN Orientation to Illinois credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/FSHN/123/>)

Introductory course for students in the department of Food Science and Human Nutrition. Students will enhance their understanding of skills and practices to aid in learning. Explore the academic environment at Illinois, and build community inside and outside the classroom.

FSHN 125 Intro to Human Nutrition credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/FSHN/125/>)

Introductory course for students in Human Nutrition. Explore department, college and campus resources. Learn about current issues, opportunities, and careers in the nutrition field. Prerequisite: Restricted to students majoring in Nutrition and Health, BS.

FSHN 130 Introduction to Food Science credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/FSHN/130/>)

Introductory course for students in Food Science (FS) focused on student learning and success, current issues, and opportunities and careers in the field of food science. In addition, students will learn about how to enhance their learning strategies. Approved for S/U grading only. Prerequisite: For freshman majoring in FSHN with a concentration in Food Science only.

FSHN 140 Introduction to Hospitality credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/140/>)

Overview of the hospitality industry with emphasis on organizational and operational structures of the major segments of the industry and career opportunities within each. Field trips required.

FSHN 145 Intro Hospitality Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/145/>)

Explore the foodservice aspect of the hospitality industry by assisting Hospitality Management seniors taking FSHN 443 in the operation of the Spice Box. Course covers the planning, production, and service of meals in specialized settings.

FSHN 150 Introduction to Dietetics credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/FSHN/150/>)

Introductory course for students in dietetics. Addresses current issues, opportunities and careers in the dietetics profession. Freshmen or transfer student into dietetics given priority.

FSHN 175 Science of Fermented Foods credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/175/>)

Discusses the evolution and commercialization of fermented foods. Provides insight into the microbial processing, manufacturing, history, nutrition, safety, and chemistry of different fermented products such as beer, bread, wine, and cheese.

FSHN 193 Edible Entrepreneurialism - Feeding Ideas for the Future credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/193/>)

Introduces students from across campus to various elements and facets of entrepreneurialism that put the consumer first. Students will explore diverse development journeys of well-known food innovators and will participate in reflective and active learning activities to learn about key facets of entrepreneurialism, focusing on important consumer-focused entrepreneurial themes such as: consumer insights, community insights, social/cultural awareness, problem solving, risk taking, resourcing, ensuring technical depth, adapting to failure, and resiliency. Approved for Letter and S/U grading.

FSHN 195 Intro to Undergrad Research credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/FSHN/195/>)

Introduce students to research and provide skill-building focused on the scientific process and nature of discovery. Help students define research topics, formulate research questions, prepare experimental plans, develop research proposals, and develop research communication skills. Approved for S/U grading only. Prerequisite: Restricted to FSHN majors only.

FSHN 199 Undergraduate Open Seminar credit: 1 to 5 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/199/>)

Experimental course on a special topic in food science and human nutrition. Topic may not be repeated except in accordance with the Code. Approved for letter and S/U grading. May be repeated in the same or subsequent terms. No more than 12 hours may be counted toward graduation.

FSHN 201 Math for Food Science credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/201/>)

Teaches mathematical concepts by solving the problems in food science related applications. Develops basic understanding of mathematical equations and simple models for solving real world food science problems. Provides instruction for writing simple computer codes using a numerical software package to solve the mathematical problem. Builds a foundation in critically analyzing physical food science problems and solving those using mathematics and coding. Prerequisite: MATH 220 and PHYS 101 or equivalent. Limited to the undergraduate students in the Food Science concentration.

FSHN 220 Principles of Nutrition credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/220/>)

Course focuses on the nutritive value of foods and metabolism of essential nutrients, as well as the application of principles of nutrition to the requirements of normal individuals throughout the life cycle.

FSHN 230 Food Sci Professional Issues credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/FSHN/230/>)

Discussion of current topics in food science and professional issues, including ethics, undergraduate research, study abroad, graduate school options and internships. Approved for S/U grading only. Prerequisite: Sophomore and Junior transfer students with a Food Science concentration only.

FSHN 231 Food Systems: Cacao & Chocolate credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/231/>)

Focused on the entire food chain from growth of cacao through processing, production and marketing of chocolate, including the nutritional aspects/health benefits of consumption of chocolate and issues surrounding cacao farmers and fair trade. The focus of this course will be a mixture of hands-on activities with lectures based on student interaction and learning. Study Abroad optional. Prerequisite: Restricted to undergrad students.

FSHN 232 Science of Food Preparation credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/232/>)

Application of food preparation principles and techniques in the preparation of standard food products; principles of food management and their application in the planning and preparation of meals. Additional fees may apply. See Class Schedule. Prerequisite: FSHN 101.

FSHN 249 Food Service Sanitation credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/FSHN/249/>)

Examines the dangers, costs and prevention of foodborne illness as well as the training and motivation of food service employees in sanitary food handling and quality assurance practices. Upon completion of this course, student will be eligible to apply for the food service sanitation certificate issued by the State of Illinois. Credit is not given for FSHN 249 and FSHN 349.

FSHN 250 Nutritional Physiology I credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/250/>)

Anatomy and physiology of the digestive, circulatory, integumentary, skeletal, and muscular system. Special focus on the absorption, distribution, storage, and mobilization of macronutrients and micronutrients. Learn the necessary concepts on cell biology and biochemistry required to understand human physiology. The manifestation of disease as a result of nutritional imbalances in body systems. Evaluation of the effectiveness and potential toxicity of nutritional supplements commonly used in the US. Pharmacological interventions and current therapeutics against diseases related to nutritional disorders. Prerequisite: Credit or concurrent enrollment in FSHN 220.

FSHN 251 Nutritional Physiology II credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/251/>)

Anatomy and physiology of the respiratory, nervous, endocrine, immune, reproductive, and excretory systems. Special focus on the absorption, distribution, storage and mobilization of macronutrients and micronutrients. Learn the necessary concepts on cell biology and biochemistry required to understand human physiology. Manifestation of disease as a result of nutritional imbalances in body systems. Evaluation of the effectiveness and potential toxicity of nutritional supplements commonly used in the US. Pharmacological interventions and current therapeutics against diseases related to nutritional disorders. Prerequisite: FSHN 220.

FSHN 260 Raw Materials for Processing credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/260/>)

Current food products use materials sourced from various types of agricultural products. The origin of the raw materials and the processing needs to transform the raw materials into consumable food products are important to understand the entire food systems. This course focuses on the agricultural products/materials and the principles and technologies applied to turn the raw materials into foods. Foods included in this course are fruits and vegetables, cereals and grains, dairy products, and meats. The focus of this course is on post-harvest technologies to ensure food safety and quality. Prerequisite: CHEM 104 and CHEM 105 and credit or concurrent enrollment in CHEM 232.

FSHN 292 Hospitality Management: Professional Issues credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/FSHN/292/>)

Explores career opportunities in the hospitality industry and prepares students for internship and job searches. Assists in developing professional skills and understanding best practices needed to be successful in the hospitality industry. Prerequisite: Hospitality Management majors only. Not intended for Freshman.

FSHN 293 Off Campus Internship credit: 0 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/293/>)

Supervised, off-campus experience in a field directly pertaining to the subject matter. Approved for Letter and S/U grading. May be repeated to a maximum of 10 hours.

FSHN 294 On Campus Internship credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/294/>)

Supervised, on-campus, learning experience with faculty engaged in research. Approved for both letter and S/U grading. May be repeated in the same or subsequent terms to a maximum of 10 hours. Prerequisite: Sophomore standing, 2.0 GPA, consent of the advisor, and consent of the Department Teaching Coordinator.

FSHN 295 UG Research or Thesis credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/295/>)

Individual research, special problems, thesis, development and/or design work under the supervision of an appropriate member of the faculty. Approved for letter and S/U grading. May be repeated in the same or subsequent terms. No more than 12 hours of special problems, research, thesis and/or individual studies may be counted toward degree. Prerequisites: Cumulative GPA of 2.5 or above at the time the activity is arranged and consent of instructor.

FSHN 302 Sensory Evaluation of Foods credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/302/>)

This course is devoted to learning the 1) physiological and psychological basis of human subjects, 2) chemistry of aroma and taste, 3) basic sensory methodologies in food evaluation, and 4) analysis and interpretation of sensory data. Additional fees may apply. See Class Schedule. Prerequisite: Recommended to students in junior and senior levels. Recommended to have taken foundational statistics course, i.e., STAT 100, STAT 200 or FSHN 440.

FSHN 320 Food Security: Service Learning in the Community credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/320/>) Food security is a major concern globally, as well as nationally, and in the local community. Students will explore social and health issues related to food security and gain an understanding of the collaborative efforts for managing food security issues in the Urbana-Champaign and campus communities. Students will learn about food security-related organizations, feeding programs, educational programs, and health initiatives to combat food insecurity in the community. Students will learn via classroom instruction, online instruction, and community-based education and service learning. Prerequisite: FSHN 101 or FSHN 120 or FSHN 220 or consent of instructor.

FSHN 322 Nutrition and the Life Cycle credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/322/>) Examines physiological changes that occur during gestation, postnatal growth, and aging and the influence of these changes on nutritional requirements. Prerequisite: FSHN 120 or FSHN 220 or consent of instructor.

FSHN 329 Communication in Nutrition credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/329/>) Application and integration of the principles of nutrition and their transmission to groups and individuals. Students will learn individual counseling techniques as well as how to present nutrition information to groups. Open to Dietetics and Human Nutrition juniors and seniors only. Prerequisite: RHET 105, CMN 101, and FSHN 120 or FSHN 220 or equivalents.

FSHN 340 Food Production and Service credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/340/>) Introduction to the management of commercial and noncommercial foodservice systems through the operation of Bevier Cafe. Students experience managing the procurement, production and service of food, as well as the sanitation and maintenance of equipment and facilities. Prerequisite: FSHN 232 and credit or concurrent registration in FSHN 249 and FSHN 345.

FSHN 343 Foundations in Beverage Management: Introduction to Wine, Beer and Spirits credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/343/>) The course will focus on the application of principles and practices related to preparation and service of alcohol and specialty beverages in the hospitality industry. The course includes a study of management principles, study of bar operations, human resources and liability protection. Intrinsic to excellent service is having an understanding of proper tasting skills and knowledge to be able to verbalize nuances within the wine or spirit. Structured tastings will be utilized to discover, identify and describe attributes of the beverage. Successful completion of alcohol handler training required to maintain course enrollment. Additional fees may apply. See Class Schedule. Prerequisite: All registrants must be 21 years of age or older.

FSHN 344 Business Etiquette credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/FSHN/344/>) The fundamentals of business etiquette as they are applied to the modern multicultural and global business environments. Content includes the importance of the first impression, polite conversation, personal appearance, office politics, diplomacy, telephone and cell phone etiquette, high-tech etiquette, proper oral and written communication, and the protocol of meetings both in the United States and abroad. Students will also participate in a formal dining experience. Offered every other year. Prerequisite: Junior standing.

FSHN 345 Strategic Operations Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/345/>) Intended to promote an understanding of the managerial aspects of strategic operations. Strategic operations management examines facilities, capacity, process/work-force planning, organization, people, systems integration, and coordination between operations. An introduction to the principles and procedures for the purchasing, selection and procurement of food and non-food items in the hospitality industry is also included. Provides students with the management information needed to make operational decisions based on sound criteria.

FSHN 346 Foundations of Hotel Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/346/>) Provides a comprehensive examination of key areas in hotel operations and management; including, revenue management, accounting, housekeeping, engineering, front desk, food and beverage and marketing. The concepts and principles will be applied in interactive online hotel case simulations designed for an immersive and applied learning experience.

FSHN 396 UG Honors Research or Thesis credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/396/>) Individual research, special problems, thesis, development and/or design work under the direction of the Honors advisor. May be repeated in the same or subsequent terms. No more than 12 hours of special problems, research, thesis and/or individual studies may be counted toward the degree. Prerequisite: Junior standing, admission to the ACES Honors Program, and consent of instructor.

FSHN 398 Undergraduate Seminar credit: 1 to 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/398/>) Group discussion on a special topic in a field of study directly pertaining to subject matter in food science and human nutrition. Approved for Letter and S/U grading. May be repeated if topics vary. Prerequisite: Sophomore standing.

FSHN 414 Food Chemistry credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/414/>) Examines the chemical aspects of major food components; water, carbohydrates, proteins, and lipids; properties of pigments, salts, and food dispersions. Undergraduate Food Science majors must enroll concurrently in FSHN 416. 3 undergraduate hours. 3 graduate hours. Prerequisite: CHEM 232.

FSHN 416 Food Chemistry Laboratory credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/416/>) Chemical and physical properties of water, proteins, lipids, carbohydrates, and other food components/additives are discovered in the context of their interactions and functional roles in foods. 3 undergraduate hours. 3 graduate hours. Prerequisite: CHEM 232 and credit or concurrent enrollment in FSHN 414.

FSHN 417 Neuroscience of Eating & Drinking credit: 3 or 4 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/417/>) Same as NEUR 417, NUTR 417 and PSYC 417. See PSYC 417.

FSHN 418 Food Analysis credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/418/>) Principles and application of the chemical, physical, and instrumental methods used to determine the constituents of foods; special considerations applicable to the analysis of certain foods. Lecture and lab. 4 undergraduate hours. 4 graduate hours. Prerequisite: CHEM 232; FSHN 414; FSHN 416 or consent of instructor.

FSHN 419 Food Ingredient Technology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/419/>)

Explores the research, science and technology of the production of safe, high quality food ingredients through the application of food chemistry, food microbiology, and food processing principles. 3 undergraduate hours. 3 graduate hours. Prerequisite: FSHN 414 or FSHN 514; FSHN 471 or FSHN 573; FSHN 481 and FSHN 482. Restricted to Senior or Graduate student standing.

FSHN 420 Nutritional Aspects of Disease credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/420/>)

Examines nutritional, biochemical, and physiological aspects of disease processes and studies the role of nutrition in prevention, management, and treatment of disease. Same as NUTR 420. 3 undergraduate hours. 3 graduate hours. Prerequisite: FSHN 220 or comparable course with a physiology prerequisite; MCB 450 or equivalent.

FSHN 421 Pediatric Clinical Nutrition credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/421/>)

Examines physiological, biochemical and nutritional aspects of disease processes relevant to infants, children and adolescents. Topics covered include prematurity, developmental disabilities, inborn errors of metabolism, food allergy, obesity and eating disorders. The role of nutrition in prevention, management and treatment of disease is also covered. Offered every other year. 3 undergraduate hours. 3 graduate hours. Prerequisite: FSHN 420; FSHN 322 is highly recommended.

FSHN 422 Introduction to Personalized Nutrition credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/422/>)

Explores the role of genetics and epigenetics in nutrition as a basis for differential responses of individuals to diet. Students will learn about how epigenetics and genetic variation affects individualistic responses to food and nutrients, and they will also learn about how food affects gene expression. Topics include genetics, epigenetics, and nutrigenetics; variation in taste, food selection, and eating behaviors; personalized nutrition; food intolerance and metabolic disorders; genetic variation in gut microbiota. This course is appropriate for students who wish to learn how to develop of better food products, optimize nutritional counseling, improve individualize diets, and better understand how to apply nutritional advice for the public generally. 3 undergraduate hours. 3 graduate hours. Prerequisite: FSHN 120 or FSHN 220 and CHEM 101; or consent of instructor.

FSHN 423 Advances in Foods & Nutrition credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/423/>)

New developments in foods and nutrition; readings, lectures, and discussions. 2 undergraduate hours. 2 graduate hours. Prerequisite: FSHN 220 and FSHN 332, or equivalent.

FSHN 424 Biopsychology of Ingestive Behavior credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/424/>)

Why do we eat what we eat? This course provides a taste of the science including both biological and psychological basis of ingestive behavior and the adoption of both healthy and maladaptive behaviors concerning eating and drinking. We will review and integrate historical theories with recent research on how we perceive flavor, the development of food preferences, and the biological basis of hunger, thirst, and satiety. Students will also have the opportunity to strengthen their critical thinking skills by participating on two debates in which equal number of arguments will be formulated to support or refute important issues in the field of food science and human nutrition. 3 undergraduate hours. 3 graduate hours.

FSHN 425 Food Marketing credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/425/>)

Same as ACE 430. See ACE 430.

FSHN 426 Biochemical Nutrition I credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/426/>)

The dietary and hormonal regulation of carbohydrate, lipid and amino acid metabolism. Emphasizes the regulation of enzyme activity and the different roles the major organs have in whole animal energy balance. Same as NUTR 426. 3 undergraduate hours. 3 graduate hours. Prerequisite: FSHN 220; or FSHN 120 and FSHN 414.

FSHN 427 Biochemical Nutrition II credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/427/>)

Biochemistry and metabolism of the water and fat soluble vitamins and minerals. Emphasizes the digestion, transport, metabolism and intercellular functions of these nutrients and how diet/food intake and physiological states affect these processes. Same as NUTR 427. 3 undergraduate hours. 3 graduate hours. Prerequisite: FSHN 220; or FSHN 120 and FSHN 414.

FSHN 428 Community Nutrition credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/428/>)

Application of nutrition principles to needs assessments, program planning, delivery and evaluation in local, national, and international settings using behavioral theory frameworks. Same as NUTR 428. 3 undergraduate hours. 3 graduate hours. Prerequisite: FSHN 220 or equivalent, one introductory statistics course, and one course in the social or behavioral sciences.

FSHN 429 Nutrition Assessment & Therapy credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/429/>)

Problem-based learning application (via cases) of the nutrition care process with emphasis on nutrition assessment, diagnosis, intervention, monitoring and evaluation, as related to the management and treatment of disease states. This course is the clinical capstone course for the dietetics curriculum. 3 undergraduate hours. 3 graduate hours. Prerequisite: FSHN 420, or concurrent enrollment required.

FSHN 430 Nexus of Food, Environmental Sustainability, and Health credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/430/>)

Students will be provided with an interdisciplinary perspective on the global food problem and how the environment impacts human health. Will cover global health concerns, with a focus on the prevention of obesity and chronic disease. Students will learn and discuss the evidence behind controversial topics related to the intersection of food, environmental sustainability and human health. 3 undergraduate hours. 3 graduate hours.

FSHN 439 Design Thinking for Restaurants credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/439/>)

Prepares students to design a full service, multi-course, restaurant experience using the design thinking process and methods. Students will develop, plan, test, and pitch a complete concept and menu for the Spice Box restaurant and work towards implementing a meaningful dining experience that goes beyond food. Students will be introduced to a variety of design methods and use them to work through each phase of the capstone project. 2 undergraduate hours. No graduate credit. Prerequisite: Credit or concurrent enrollment in FSHN 340. Restricted to Seniors majoring in Hospitality Management.

FSHN 440 Applied Statistical Methods I credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/440/>)

Same as ANSC 440, CPSC 440, NRES 440, and NUTR 440. See CPSC 440.

FSHN 441 Services Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/441/>)

Focuses on a distinctive approach to communication, design, and operation that is required by service organizations (e.g., hotels, restaurants, professional services, banks, hospitals, etc.). Students will explore ways that firms can observe, measure, improve, and utilize service as a primary source of competitive advantage. Students will learn about the unique challenges of services and the different roles both employees and customers have in the creation and delivery of services. They will also practice how to develop and manage the service encounter in order to deliver service quality to the customer. 2 undergraduate hours. 2 graduate hours. Prerequisite: Previous exposure to marketing principles, management principles, and customer service scenarios is recommended. Restricted to Junior, Senior, or Graduate class standing.

FSHN 442 Hospitality Management & Leadership Skills credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/442/>)

Application of behavioral science and management techniques, methods and strategies to the hospitality industry. Applied management techniques will focus on those managerial behaviors needed to develop and maintain positive and productive relationships with subordinates, peers, supervisors and individuals external to the hospitality organization. 3 undergraduate hours. 3 graduate hours.

FSHN 443 Management of Fine Dining credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/443/>)

Advanced application of food production and management principles to specific food service demands; emphasis on artistry in preparation, serving, and merchandising high quality food in quantity. 4 undergraduate hours. No graduate credit. Prerequisite: FSHN 340 and FSHN 439 and credit or concurrent registration in FSHN 442. Restricted to seniors.

FSHN 450 Dietetics: Professional Issues credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/450/>)

Discussion of current topics in dietetics, professional issues (ethics, outcomes research, marketing, legislation, registered dietitian exam) and preparing for dietetic internships. Required of all dietetics students. 2 undergraduate hours. 2 graduate hours. Prerequisite: Senior standing in dietetics.

FSHN 453 Nutrition for Performance credit: 3 or 4 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/453/>)

Same as HK 453. See HK 453.

FSHN 459 Nutrition Focused Physical Assessment credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/459/>)

Collect appropriate subjective and objective data associated with obtaining a health and diet history. An introduction to physical and diagnostic assessment of health status. The emphasis is on knowing normal findings and normal variations in the healthy adult, well child, and the well elder person. 2 undergraduate hours. 2 graduate hours. Prerequisite: FSHN 329 and FSHN 420 and credit or concurrent enrollment in FSHN 429.

FSHN 460 Food Processing Engineering credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/460/>)

Examines application of process engineering principles to the conversion of raw agricultural materials into finished food products. Topics include basics of engineering analysis, units and dimensions, materials balances, energy balances, thermodynamics, heat transfer, psychrometry, refrigeration and mechanical separations. 3 undergraduate hours. 3 graduate hours. Prerequisite: MATH 220, PHYS 101, and FSHN 201; or consent of instructor.

FSHN 464 Beverage Science & Technology credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/464/>)

Explores the research, science and technology of the production of safe, high quality beverages through the application of food chemistry, food microbiology, and food processing principles. 2 undergraduate hours. 2 graduate hours. Prerequisite: FSHN 414 or consent of instructor. FSHN juniors, seniors and grad students only.

FSHN 465 Principles of Food Technology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/465/>)

Overview of processing techniques in the food industry, including thermal/non-thermal processing, refrigeration, freezing, moisture removal, and separation. Presentations cover basic principles of each technology with examples of processing equipment. The changes of food components and nutrients caused by processing is also discussed. Lecture and field trips. 3 undergraduate hours. 3 graduate hours. Credit is not given for both FSHN 465 and the FSHN 461 - FSHN 462 sequence. Prerequisite: Food chemistry or biochemistry equivalent recommended. Undergraduate food science majors or graduate students specializing in food processing/engineering may not enroll in FSHN 465.

FSHN 466 Food Product Development credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/466/>)

Food Science undergraduate capstone experience for an Institute of Food Technologists (IFT) approved curriculum. The course utilizes a team-based format, and its intention is to allow students an opportunity to solve professional food science problems while developing novel food products. This course serves as an experiential learning space for students to practice applying, analyzing, and evaluating acquired food science theory through the creative experimental lens of food product development. Additional fees may apply. See Class Schedule. 4 undergraduate hours. 4 graduate hours. Prerequisite: Must complete FSHN 232, FSHN 302, FSHN 416, FSHN 419, FSHN 471, FSHN 472, FSHN 484; and concurrent enrollment of FSHN 418 and FSHN 482.

FSHN 469 Package Engineering credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/469/>)

Cross-disciplinary study of the materials, machinery, research, design, techniques, environmental considerations, ethics and economics used in the global packaging industry with emphasis on the implementation of improved technologies for the problems unique to food packaging. An emphasis on the broad, systems-based nature of packaging will be maintained throughout the course. Same as ABE 482. 3 undergraduate hours. 3 graduate hours. Prerequisite: MATH 220; one each of 100-level Chemistry and Physics courses or their equivalent; junior-senior standing or higher, or consent of instructor.

FSHN 471 Food & Industrial Microbiology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/471/>)

Relationship of microorganisms to food manufacture and preservation, to food and industrial fermentation and processing, and to food-borne illness. Same as MCB 434. 3 undergraduate hours. 3 graduate hours. Credit is not given for FSHN 471 and FSHN 175. Prerequisite: Previous microbiology course such as MCB 100, MCB 250, or MCB 300.

FSHN 472 Applied Food Microbiology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/472/>)

Explores experimental methods for studying microbial food safety, quality, and fermentation. Introduces basic microbiology techniques and uses them to study how to detect and control spoilage microorganisms and potential foodborne pathogens. Conduct and experimentally track the progress of classic food fermentations. 3 undergraduate hours. 3 graduate hours. Credit is not given for both FSHN 472 and FSHN 312. Prerequisite: MCB 100 and credit or concurrent enrollment in FSHN 471.

FSHN 475 Science of Fermented Foods Lab credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/475/>)  
Provides students with experiential learning on the commercial production of fermented foods and beverages. It will also discuss the processing methods and quality control of different fermented products such as yogurt, beer, and bread. 2 undergraduate hours. 2 graduate hours. Prerequisite: FSHN 175 or FSHN 471.

FSHN 480 Basic Toxicology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/480/>)  
Emphasizes basic toxicology principles and the pharmacokinetics, absorption, distribution, metabolism and excretion of drugs, non-nutrient dietary supplements and other compounds foreign to the body. Toxic effects on major target organ systems are discussed, including an introduction to how foreign compounds can initiate, enhance or prevent the carcinogenic process. Briefly surveys diverse areas of toxicology such as eco-, nano-, forensic, genetic, nutritional, clinical and reproductive toxicology; review the federal regulatory aspects of safety assessment and consumer protection. Same as CB 449, CPSC 433, and ENVS 480. 3 undergraduate hours. 3 graduate hours.

FSHN 481 Food Processing Unit Operations I credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/481/>)  
Study the engineering principles that govern food processing and preservation unit operations, including evaporation, freeze-concentration, membrane separation, dehydration, centrifugation, and extrusion, and understand the effect of the process conditions of various unit operations on product characteristics and product quality. 2 undergraduate hours. 2 graduate hours. Prerequisite: FSHN 414 or equivalent; FSHN 460 or equivalent; FSHN 312 or FSHN 471 or equivalent. FSHN 260 is recommended.

FSHN 482 Food Processing Unit Operations I Lab credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/FSHN/482/>)  
Focus on topics discussed in Food Processing Unit Operations I (FSHN 481) in a food grade environment. Students will have opportunities to operate pilot scale food processing equipment for each unit operation. Additional fees may apply. See Class Schedule. 1 undergraduate hour. 1 graduate hour. Prerequisite: FSHN 481.

FSHN 483 Food Processing Unit Operations II credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/483/>)  
Study the engineering principles that govern food processing and preservation unit operations, including evaporation, freeze-concentration, membrane separation, dehydration, centrifugation, and extrusion, and understand the effect of the process conditions of various unit operations on product characteristics and product quality. 2 undergraduate hours. 2 graduate hours. Prerequisite: FSHN 414 or equivalent; FSHN 460 or equivalent; FSHN 312 or FSHN 471 or equivalent. FSHN 260 is recommended.

FSHN 484 Food Processing Unit Operations II Lab credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/FSHN/484/>)  
Focus on topics discussed in Food Processing Unit Operations II (FSHN 483) in food grade environment. Students will have opportunities to operate pilot scale food processing equipment for each unit operation. Additional fees may apply. See Class Schedule. 1 undergraduate hour. 1 graduate hour. Prerequisite: FSHN 483.

FSHN 499 Cur Topics in FS & Human Nutr credit: 1 to 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/499/>)  
Group discussion or an experimental course on a special topic in food science and human nutrition. 1 to 3 undergraduate hours. 1 to 3 graduate hours. Approved for Letter and S/U grading. May be repeated in the same or subsequent terms to a maximum of 12 hours as topics vary.

FSHN 502 Advanced Sensory Science credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/502/>)  
In-depth and current topics in sensory science beyond the scope of undergraduate sensory course, FSHN 302. The main course objectives are to 1) discuss the physiological and psychological basis for sensory evaluation, 2) discuss Thurstonian Modeling in Difference Tests, 3) utilize multivariate statistical methods in sensory studies, 4) critique current research papers and articles in the sensory science discipline, and 5) develop a proposal for research utilizing sensory methods. Prerequisite: Undergraduate sensory science course, such as FSHN 302. Graduate students only.

FSHN 510 Topics in Nutrition Research credit: 1 to 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/510/>)  
Same as ANSC 525 and NUTR 510. See NUTR 510.

FSHN 511 Regulation of Metabolism credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/511/>)  
Same as ANSC 521 and NUTR 511. See NUTR 511.

FSHN 514 Advanced Food Chemistry credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/514/>)  
Emerging issues related to the chemistry of water, carbohydrates, lipids and proteins, as well as postharvest physiology and impact of processing on chemical reactions in foods. Prerequisite: Organic CHEM 232, or equivalent.

FSHN 518 Chemistry of Lipids in Foods credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/518/>)  
Detailed examination of the chemical and physical properties of lipids in foods. Offered every other year. Prerequisite: A food chemistry or biochemistry course is highly recommended.

FSHN 519 Flavor Chemistry and Analysis credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/519/>)  
Provides graduate students with the tools and understanding necessary for the study of complex food flavor systems. Students will learn: 1) modern techniques of analysis used in the chemical evaluation of food flavor systems, 2) accepted techniques for the sensory evaluation of food flavor, 3) approaches for combined sensory-analytical evaluation of food flavor and 4) principles of food flavor chemistry with emphasis placed on some well-understood flavor systems. Offered every other year. Prerequisite: FSHN 414 and FSHN 418 or equivalent.

FSHN 520 Advanced Clinical Nutrition credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/520/>)  
Same as NUTR 561. See NUTR 561.

FSHN 521 Molecular Basis of Metabolic Syndrome and Weight Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/521/>)  
The objective of the course is to help nutritionists and dietitians build a strong biochemical, physiological, clinical and epidemiological foundation in the areas of: metabolic adaptation to positive and negative energy balance; underlying mechanism in progression and regression of metabolic syndrome; prevention of overeating; and principles and design of a dietary weight loss/maintenance program. Same as NUTR 521. 3 graduate hours. No professional credit. Prerequisite: Credit or concurrent enrollment in MCB 450 or any introductory biochemistry course; and MCB 244 or MCB 246 or any introductory physiology course; and FSHN 420; or consent of instructor.

FSHN 522 Dietary Prevention of Cardiovascular and Other Chronic Diseases credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/522/>)

The objective of the course is to help nutritionists and dietitians build a strong biochemical, physiological, clinical and epidemiological foundation for dietary prevention of noncommunicable diseases including coronary artery disease, stroke, hypertension, osteoporosis, cancer and chronic inflammation. In particular, we will focus on evaluating the strength of evidence of the following nutrients on prevention of chronic diseases: cholesterol, saturated fatty acids, essential fatty acids, sodium, potassium, vitamin D and calcium. Same as NUTR 522. 3 graduate hours. No professional credit. Prerequisite: Credit or concurrent enrollment in MCB 450 or any introductory biochemistry course; and MCB 244 or MCB 246 or any introductory physiology course; and FSHN 420; or consent of instructor.

FSHN 527 Advanced Vitamins and Minerals: Regulations of Metabolism credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/527/>)

Combined lectures and in-class case studies of vitamins and minerals as the regulators of nutrition, metabolism, and overall human health. Lectures include genetic, biochemical background information and basic epigenetic mechanisms. In-class case studies will involve body physiology, human development, and specific diseases. Same as NUTR 527. 3 graduate hours. No professional credit. Prerequisite: One biochemical course, such as FSHN 426, FSHN 427, MCB 450, or equivalent.

FSHN 550 Grantsmanship and Ethics credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/550/>)  
Same as NUTR 550. See NUTR 550.

FSHN 552 Advanced Diabetes Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/552/>)

Discuss current topics in advanced diabetes management for nutrition professionals who plan to work directly in patient care, research, and administrative roles with patients with diabetes. 3 graduate hours. No professional credit. Prerequisite: FSHN 420.

FSHN 563 Food Materials Science credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/563/>)

Study of the structure of foods that confer attributes such as soft, crunchy, juicy, creamy, and many others. Foods will be probed at the micro and nano scales. The goal is to better understand, predict, and design food properties and functionalities. 2 graduate hours. No professional credit. Prerequisite: FSHN 414 (Food Chemistry) or equivalent.

FSHN 573 Advanced Food Microbiology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/573/>)

Detailed examination of food microbiology topics including food-borne pathogens, food fermentation and microbial spoilage. Prerequisite: Graduate student standing or consent of instructor.

FSHN 574 Value Added Biotransformation credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/574/>)

Crop residues, renewable biomass, and agricultural wastes as sustainable and inexpensive substrates for producing value added products through enzymatic and microbial conversion processes. Concepts and applications of metabolic engineering. 3 graduate hours. No professional credit. Prerequisite: FSHN 471.

FSHN 575 Issues in Food Safety credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/575/>)

Current issues affecting the safety of the food supply including emerging pathogens, food additives and pesticides, genetically modified organisms and new technologies will be evaluated in the context of current scientific knowledge, United States food law, and consumer opinions. Offered every other year. Prerequisite: Graduate standing.

FSHN 576 Food Safety for Global Food Security credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/576/>)

How can food safety promote the availability and access of culturally appropriate foods for all people? Students will explore that question by engaging with literature on the burden of foodborne disease, risk assessment and management technologies, and commodity specific food safety risks. Course will focus on readings of primary and secondary literature, in-class discussions, and exercises to evaluate the literature, and a structured writing assignment to apply those concepts to current problems in food safety. 3 graduate hours. No professional credit. Prerequisite: FSHN 471 or FSHN 573.

FSHN 580 Ethics in Research, IRB and IACUC credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/580/>)

The goals of this course are twofold. First, to provide graduate students with an introduction to knowledge and skills that will facilitate ethical behavior in research. Second, to increase their sensitivity to ethical issues. We will review rules, issues, options and resources to meet regulatory and institutional expectations (including Institutional Review Board (IRB) and Institutional Animal Care and Use Committee (IACUC)). We will foster their ethical decision-making skills by discussing and analyzing real (or realistic) ethical cases. We will identify failures, justify decisions, and generate potential solutions to those errors. Same as NUTR 580. 3 graduate hours. No professional credit.

FSHN 590 Dietetic Internship I credit: 5 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/590/>)

Supervised learning experience in a variety of settings and locations related to clinical nutrition, community nutrition and health promotion, and food service management within Urbana/Champaign and surrounding areas. Additional fees may apply. See Class Schedule. 5 graduate hours. No professional credit. Approved for Letter and S/U grading. Prerequisite: Acceptance in the dietetic internship program.

FSHN 591 Dietetic Internship II credit: 5 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/591/>)

Supervised learning experience in a variety of settings and locations related to clinical nutrition, community nutrition and health promotion, and food service management within Urbana/Champaign and surrounding areas. Additional fees may apply. See Class Schedule. Approved for letter and S/U grading. Prerequisite: FSHN 590.

FSHN 592 Graduate Internship Experience credit: 0 to 12 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/592/>)

Supervised, off-campus experience in a field related to a students' option/concentration. Approved for letter and S/U grading. May be repeated in separate terms to a maximum of 12 hours.

FSHN 593 Seminar in Foods and Nutrition credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/593/>)

Communication-based course that focuses on enhancing professional oral presentation skills, particularly with regard to communicating current food science and/or human nutrition topics. 2 graduate hours. No professional credit. Prerequisite: Undergraduate degree in foods, nutrition, or comparable background in chemistry, microbiology, physiology, or other biological science; consent of instructor.

FSHN 595 Advanced Topics in Food Science and Human Nutrition  
credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/595/>)

Studies of selected topics in Food Science. Study may be on specialized topics in any one of the following fields: food chemistry, food microbiology, nutrition, food processing/engineering. Lectures and/or laboratory. 1 to 4 graduate hours. No professional credit. May be repeated if topics vary. Students may register only once for a given topic. Prerequisite: Graduate level status or consent of instructor.

FSHN 597 Graduate Seminar credit: 0 to 1 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/597/>)

Discussions on specialized research topics and current literature relating to food science and human nutrition. Required of all graduate students. 0 to 1 graduate hours. No professional credit. Approved for Letter and S/U grading. May be repeated in separate terms.

FSHN 598 Advanced Special Problems credit: 1 to 8 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/598/>)

Supervised individual study on advanced special problems in food science and human nutrition. Approved for letter and S/U grading. May be repeated in the same or subsequent semesters. (Summer session: 1 to 4 graduate hours). Prerequisite: Written consent of instructor must be obtained prior to enrollment.

FSHN 599 Thesis Research credit: 0 to 16 Hours. (<https://courses.illinois.edu/schedule/terms/FSHN/599/>)

Original research designed and conducted under graduate faculty supervisor. Approved for S/U grading only. May be repeated.