## Fall 2020 Course Descriptions as of 04/02/2020 08:12 PM

Information in Browse Course Catalog is subject to change. Information is term specific. Please refer to the appropriate term when searching for course content. Key to Course Descriptions may be found at: **http://rcs.registrar.arizona.edu/course_descriptions_key**.

### Nutritional Sciences (NSC)

**NSC 101: Introduction to Human Nutrition** (3 units)
**Description:** Current concepts and controversies in human nutrition. Carbohydrate, protein, lipids, vitamins and minerals in nutrition; and the relation of nutrition to health throughout the life cycle.
**Grading basis:** Regular Grades
**Career:** Undergraduate

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| **Course Components:** | Discussion | May Be Offered |
| | Lecture | Required |

**Equivalent to:** NSC 170C1
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer
Online Campus: Fall, Winter, Spring, Summer
Distance Campus: Fall

**Recommendations and additional information:** Only for students who have NOT taken NSC 170C1 (Nutrition, Food and You).
**Enrollment requirement:** Must not have taken NSC 170C1 (Nutrition, Food and You).

**NSC 115: Personal Sports Nutrition** (1 unit)
**Description:** This course is designed for active individuals who want to build muscle, lose weight, boost energy, manage stress, and/or improve exercise performance. The most recent evidence-based sports nutrition guidelines will be reviewed; including what, when, and how much to eat for optimal sports performance. Students will create personalized meal plans that include eating before, during, and after exercise. Hydration schedules will be developed to help avoid dehydration. Additionally, students will evaluate supplements and ergogenic sports products.
**Grading basis:** Regular Grades
**Career:** Undergraduate

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| **Course Components:** | Lecture | Required |

**Course typically offered:**
Main Campus: Fall, Spring

**NSC 120: Basic Computer Skills for Office Applications** (3 units)
**Description:** This course covers Microsoft Office 365 and more. Its major objective is to give students the learning experience developing skills in cyber competencies they need to enhance productivity in their tenure at the university and in the workplace after graduation. The introductory unit helps students become familiar with essential computing concepts, i.e., hardware and software, different apps, and the Windows operating system. Subsequently, they will learn file management and the basics of browsers and e-mail. The application units cover Microsoft Word, Excel, and PowerPoint taught at basic/intermediate levels. Introductory material for Microsoft Access is also presented.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Flat Fee:** $32
**Course Components:** Laboratory — May Be Offered
Lecture — Required
**Equivalent to:** ABE 220, ABT 220, AGTM 120, AGTM 220, ENGR 220, FCR 120, FCR 220, FCSC 120, NFS 220, N_SC 120, N_SC 220, PLS 120
**Also offered as:** AGTM 120, BE 120, FCSC 120, PLS 120
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer
Online Campus: Fall, Winter, Spring, Summer
Distance Campus: Fall, Winter, Spring, Summer

**Home department:** Biosystems Engineering

**NSC 150C1: Sustainable Nutrition and Food Systems** (3 units)
**Description:** This course provides an introduction to the US food system and examines the relationships between food systems and nutritional science, public health, the environment, and society. Topics include food system outcomes on nutritional and ecological health, drivers of the food systems including food policy and economics, and food in communities and on tables including dietary patterns and creating healthy food environments.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture — Required
**Course typically offered:**
Main Campus: Fall, Spring

**NSC 170C1: Nutrition, Food and You** (3 units)
**Description:** Only for students who have not taken N SC 101 (Introduction to Human Nutrition). Nutrition, Food and You covers the principles of human nutrition. Topics include digestion, absorption, metabolism, vitamins, minerals, life cycle nutrition and food safety.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Discussion — May Be Offered
Lecture — Required
**Equivalent to:** NSC 101
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer
Online Campus: Fall, Winter, Spring, Summer

**Enrollment requirement:** Enrollment not allowed if you have previously taken NATS 104 "Nutrition, Food and You " (Topic 6).
**General Education:** NATS 104

**NSC 170C2: The Science of Fermentation - When Bad Food Turns Good** (3 units)
**Description:** The course will introduce students to the fundamentals of fermentation - brief history, basic processes, and potential health benefits of fermented foods - placed within the context of human history, health and nutritional sciences. Topics include methods of food preservation, the gut microbiome and chronic disease, and implications for individual and community economic security. The semester will conclude with a food case study, in which each student will create a fermented food and describe the process and critical quality controls, complete a sensory evaluation, and conduct a nutrient analysis using a USDA database.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture — Required
**Course typically offered:**
Main Campus: Spring

**NSC 225: Foundational Skills in Nutritional Sciences** (2 units)
**Description:** This course will build on fundamental concepts presented in introductory nutrition courses. Extensive practice in nutrition calculations, basic nutrition assessment, and meal planning will be utilized to apply core concepts around analyzing nutrition adequacy, food composition (macro- and micronutrient), and meal planning.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture — Required
**Course typically offered:**
Main Campus: Fall, Spring
Online Campus: Fall, Spring

**Enrollment requirement:** NSC Majors Only; Completion of NSC 101 or NSC 170C1 prior to enrolling in this course.

**-SA** represents a Student Abroad & Student Exchange offering
**-CC** represents a Correspondence Course offering
**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NSC 255: Food and Culture** (3 units)
**Description:** Food is a highly diversified, yet personal experience that binds all cultures. Through this course students will experience the role of food in a variety of cultures and learn how the surrounding environment influences the tastes and flavors of a region. The course will combine assignments with readings and activities to help students begin to understand commonalities as well as diversities in cuisines and cultures. By completing assignments and activities each student will gain an appreciation of regional crops and how they contribute to both cuisine and culture.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Spring, Summer, Winter
Online Campus: Spring, Summer, Winter

**General Education:** Tier 2 Individuals & Societies
**Honors Course:** Honors Contract
**Honors Course:** Honors Contract

**NSC 260: Nutrition Communication and Scientific Literacy** (3 units)
**Description:** This course will prepare students to critically evaluate or interpret, summarize, and communicate evidence-based scientific information in a variety of public and professional venues, including but not limited to scientific conferences, public forums (e.g., social media), food demonstrations and the classroom.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Fall, Spring

**Enrollment requirement:** Completion of NSC 101 or NSC 170C1; Nutritional Sciences majors only; sophomore, junior, or senior status; (ENGL 102 or ENGL 109H).

**NSC 299: Independent Study** (1 - 3 units)
**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work.
**Grading basis:** Alternative Grading: S, P, F
**Career:** Undergraduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated a maximum of 99 times.
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

**NSC 299H: Honors Independent Study** (1 - 6 units)
**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated a maximum of 99 times.
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

**Enrollment requirement:** Student must be active in the Honors College.
**Honors Course:** Honors Course
**Honors Course:** Honors Course

**NSC 301: Nutrition and the Life Cycle** (3 units)
**Description:** Role of nutrients in human development. Physiological bases for changes in nutrient requirements throughout the life cycle (pregnancy, lactation, infancy, childhood, adolescence and aging).
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Fall, Spring, Summer
Online Campus: Fall, Spring, Summer
Distance Campus: Fall, Summer

**Enrollment requirement:** NSC 101 or NSC 170C1 must be completed prior to enrollment in NSC 301.

**NSC 308: Nutrition and Metabolism** (3 units)
**Description:** Introduction to nutritional sciences and the integration of the effects of nutrients and nutritional status of metabolic and physiological functions at the cellular, tissue, organ and system level in humans as related to health and disease. Designed for nutritional sciences majors and those with a background in biological and chemical sciences.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Fall, Spring, Summer
Online Campus: Spring, Summer

**Enrollment requirement:** CHEM 152 or 142, MCB 181R and (NSC 101 or 170C1).

**NSC 310: Principles of Human Nutrition in Health and Disease** (3 units)
**Description:** Application of basic nutritional principles in the selection of normal and therapeutic diets; designed for students in the health sciences.
**Grading basis:** Regular Grades
**Career:** Undergraduate

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| **Course Components:** | Discussion | May Be Offered |
| | Lecture | Required |

**Course typically offered:**
Main Campus: Fall, Summer
Online Campus: Summer

**Recommendations and additional information:** Tier Two Natural Sciences course requisite: two courses from Tier One Natural Sciences.
**General Education:** Tier 2 Natural Sciences

**NSC 311: A Systems Approach to Obesity Prevention** (3 units)
**Description:** The goal of this course is to present a systems approach to obesity prevention - i. e. understanding the complex task of trying to change the way people eat, move, and live, and sustaining those changes over time. Students will learn causes and correlates of diet, physical activity, and obesity, data and methods related to assessment of obesity, the health and financial consequences of the obesity epidemic, and will gain insights into obesity prevention, treatment and policy approaches. Students will read peer-reviewed publications on obesity, participate in class discussion and debates, and engage in experiential activities that will reinforce learning.
**Grading basis:** Regular Grades
**Career:** Undergraduate

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| **Course Components:** | Lecture | Required |

**Course typically offered:**
Main Campus: Spring
Online Campus: Spring

**Enrollment requirement:** NSC 101 or NSC 170C1.
**Honors Course:** Honors Contract
**Honors Course:** Honors Contract

**-SA** represents a Student Abroad & Student Exchange offering
**-CC** represents a Correspondence Course offering
**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NSC 315: Sports Nutrition** (3 units)
**Description:** The course will span basic physiology as it applies to nutrition and sport, nutrient utilization, body composition, & application of nutrition for different sports in training & competition. It will look at strategies for optimal performance in endurance, court & power sports. Practical applications & guest lectures will be included.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Spring, Summer
Online Campus: Spring, Summer

**Enrollment requirement:** Completion of NSC 101 or NSC 170C1.

**NSC 320: Nutrition, Physical Activity, and Health Promotion** (3 units)
**Description:** This course is designed to build the knowledge and practical skills needed to motivate, communicate, and effect positive nutrition, physical activity, and health behavioral changes in the general population. Students will learn to create nutrition programs, perform physical fitness assessments, set realistic health goals, build rapport, and identify weight management challenges. Topics including nutrition and digestion, obesity physiology, and nutritional programming will be discussed and practiced within case studies. In addition, this course prepares students for the American Council on Exercise (ACE) Personal Training Certification Exam and the ACE Health Coach Certification Exam. Completion of these exams are optional and do not count toward the grade for this course. NOTE: CPR certification required in order to take certification exams
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Fall, Spring

**Recommendations and additional information:** PSIO 201 recommended prior to enrollment in this course.
**Enrollment requirement:** Completion of NSC 170C1 or NSC 101 prior to enrollment in this course.

**NSC 325: Foundations of Medical Nutrition Therapy** (4 units)
**Description:** This course will provide the foundations for applying medical nutrition therapy through the nutrition care process. The application of basic nutrition science principles in the selection of the basic appropriate medical nutrition therapies related to the nutrition care process in obesity, and enteral and parenteral nutrition will also be investigated. Development of a knowledge base through applying the appropriate Academy of Nutrition & Dietetic Association's international standardized terminology and use of medical terminology as it relates to health and disease will also be achieved.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Spring, Summer

**Enrollment requirement:** Dietetics Option within the Nutritional Sciences major. NSC 308. Prerequisite or concurrently enrolled in CHEM 241A and PSIO 202.

**NSC 325L: Foundations of Medical Nutrition Therapy Lab** (1 unit)
**Description:** This lab provides students hands on experience with physical and diagnostic assessment of health status. Novice skills will be developed regarding: performing a nutrition-focused physical examination, obtaining vital skills, measurement and interpretation of anthropometric measurements, body composition; physical assessment of fluid status; obtaining and assessment of respiratory and cardiac sounds; intra- and extra-oral assessment and dysphagia screening. Students will discuss and practice skill development relating to conducting and interpreting findings from a nutrition-focused physical assessment in order to develop a nutrition care plan. The lab also provides practice with patient interviewing and counseling techniques.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Laboratory Required
**Course typically offered:**
Main Campus: Fall, Spring

**Enrollment requirement:** NSC 325 or concurrent. Open to Dietetics students only; special permission for Nutrition option students may be provided.

**NSC 351L: Food Studies Laboratory** (1 unit)
**Description:** An introduction to the food study laboratory with emphasis on development of skills and observation of phenomena during food preparation. Heavy emphasis will be placed on sanitation and cleanliness. Experiments designed to complement corresponding lecture class.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Flat Fee:** $77
**Course Components:** Laboratory Required
**Course typically offered:**
Main Campus: Fall, Spring
Distance Campus: Spring

**Enrollment requirement:** Major: NUSC. Prerequisite or concurrent registration, NSC 351R.

**NSC 351R: Fundamentals of Food Science** (3 units)
**Description:** Scientific principles of food production, preservation, and ingredient interactions.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Equivalent to:** NSC 353
**Course typically offered:**
Main Campus: Fall, Summer
Online Campus: Fall, Summer
Distance Campus: Fall, Summer

**Enrollment requirement:** CHEM 152 or 142 and (NSC 101 or NSC 170C1). Must not have taken NSC 353.

**NSC 353: Fundamentals of Food Science & Safety** (3 units)
**Description:** An on-line course that explores basic principles of food safety and food chemistry as they relate to food preparation. The course provides students with content to help them understand topics that are important to food preparation and safety as well as government regulations that affect food labeling and food preparation. Food safety in food preparation is foremost among them. This course will provide the background for one to become a certified food handler through the National Restaurant Association¿s ServSafe Program. The course also presents basic information and techniques covering food processing, food menu planning, purchasing and preparation techniques, ingredient interaction, and a basic understanding of the composition of macronutrients in food.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Equivalent to:** NSC 351R
**Course typically offered:**
Main Campus: Spring, Summer
Online Campus: Spring, Summer

**Recommendations and additional information:** Credit allowed for NSC 351R or NSC 353 but not both.
**Enrollment requirement:** Must not have taken NSC 351R.
**General Education:** Tier 2 Natural Sciences
**Honors Course:** Honors Contract
**Honors Course:** Honors Contract

**NSC 358L: Institutional Food Management Laboratory** (1 unit)
**Description:** The Quantity Food Production Management lab provides students the hands on experience of learning and operating quantity food production equipment and the management experience of planning, purchasing, staffing and producing a menu for a lunch operation serving 100+ meals. Students will be required to meet all dress code requirements of the production facility.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Flat Fee:** $35
**Course Components:** Laboratory Required
**Course typically offered:**
Main Campus: Spring

**Enrollment requirement:** Major: Nutritional Sciences, Dietetics option only. Concurrent enrollment or completion of NSC 351R. Concurrent enrollment in NSC 358R.
**Student Engagement Activity:** Community Partnership
**Student Engagement Competency:** Civic and Community

**NSC 358R: Institutional Food Management** (2 units)
**Description:** Quantity food preparation and service, factors affecting food purchasing, storage, and inventory; menu planning for institutions, management of time and labor and use of institutional equipment, equipment selection and maintenance.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Spring

**Enrollment requirement:** Major: Nutritional Sciences, Dietetics option only. Concurrent enrollment 358L. Concurrent enrollment or completion of NSC 351R. Completion of NSC 101 or NSC 170C1.

**NSC 366A: Nutritional Anthropology** (3 units)
**Description:** Biocultural approach to human nutrition. Explores factors that influence what and how we eat emphasizing an understanding of nutritional adaptations, population differences in food utilization, and nutrition problems in the contemporary world.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Equivalent to:** ANTV 366A, ANTV 366A, N_SC 366A
**Also offered as:** ANTH 366A
**Course typically offered:**
Main Campus: Fall (even years only)

**Home department:** School of Anthropology

**NSC 375: Diet, Genes and Disease** (3 units)
**Description:** Current knowledge of human nutrition and genes has created a unique opportunity to use diet and other biologically active food components in the diet to improve the quality of life of people by the prevention and treatment of human disease. Also called Nutrigenomics, the identification and understanding of how nutrients and bioactive food components interact with the genome will be discussed.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Summer
Online Campus: Summer

**General Education:** Tier 2 Natural Sciences

**NSC 376: Bioactive Compounds and Food Additives** (3 units)
**Description:** Bioactive food compounds (BAFC) are components in food that have biological activity in the body, yet have no disease associated with their absence. Food additives are usually meant to affect a food quality, but by proxy can also have biological effects on the body. These topics are covered in detail so that students are not limited to the basic 6 nutrients.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Summer
Online Campus: Summer

**Enrollment requirement:** Prerequisite NSC 170C1 or NSC 101

**NSC 391: Preceptorship** (1 - 6 units)
**Description:** Specialized work on an individual basis, consisting of instruction and practice in actual service in a department, program, or discipline. Teaching formats may include seminars, in-depth studies, laboratory work and patient study.
**Grading basis:** Alternative Grading: S, P, F
**Career:** Undergraduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated for a maximum of 6 units.
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

**NSC 391H: Honors Preceptorship** (1 - 3 units)
**Description:** Specialized work on an individual basis, consisting of instruction and practice in actual service in a department, program, or discipline. Teaching formats may include seminars, in-depth studies, laboratory work and patient study.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Independent Study Required
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

**Enrollment requirement:** Student must be active in the Honors College.
**Honors Course:** Honors Course
**Honors Course:** Honors Course

**NSC 392: Directed Research** (1 - 6 units)
**Description:** Individual or small group research under the guidance of faculty.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated for a maximum of 6 units.
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

**NSC 393: Internship** (1 - 6 units)
**Description:** Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.
**Grading basis:** Alternative Grading: S, P, F
**Career:** Undergraduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated a maximum of 99 times.
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

**Student Engagement Activity:** Engagement Activity TBD
**Student Engagement Competency:** Engagement Competency TBD

**NSC 395A: Experiential Learning in Nutritional Sciences** (2 units)
**Description:** This course offers an organized volunteer and work opportunity with oversight by the department and a classroom component.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Colloquium Required
**Course typically offered:**
Main Campus: Fall, Spring

**Recommendations and additional information:** This course requires students to work on-site at an organization in their community.
**Enrollment requirement:** Major: NUSC. NSC 101 or NSC 170C1 must be completed prior to enrollment in NSC 395A.
**Student Engagement Activity:** Community Partnership
**Student Engagement Competency:** Professionalism

**NSC 395B: Special Topics in Nutritional Sciences** (1 - 3 units)
**Description:** This short course will examine current, rapidly changing topics of immediate relevance to Nutritional Sciences. The topic selected will be presented from different perspectives incorporating cutting edge basic, clinical and translational science and will provide information that addresses the prevention and treatment of a nutrition condition where appropriate.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Colloquium Required
**Repeatable:** Course can be repeated a maximum of 3 times.
**Course typically offered:**
Main Campus: Fall, Spring

**NSC 396A: Survey of Nutrition Careers** (1 unit)
**Description:** Overview of Nutritional Science and Dietetics as a profession.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Seminar Required
**Course typically offered:**
Main Campus: Fall, Spring
Online Campus: Fall, Spring

**NSC 399: Independent Study** (1 - 3 units)
**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work.
**Grading basis:** Alternative Grading: S, P, F
**Career:** Undergraduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated a maximum of 99 times.
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

**-SA** represents a Student Abroad & Student Exchange offering
**-CC** represents a Correspondence Course offering
**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NSC 399H: Honors Independent Study** (1 - 3 units)
**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated a maximum of 99 times.
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

**Enrollment requirement:** Student must be active in the Honors College.
**Honors Course:** Honors Course
**Honors Course:** Honors Course

**NSC 408: Nutritional Biology** (3 units)
**Description:** Structure and function of nutrients, digestion and metabolism of proteins, carbohydrates, lipids, vitamins and minerals; energy and maintenance of cellular functions; nutritional ecology of monogastrics and ruminants; elements of gene regulation; nutritional and hormonal influences on gene expression.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Equivalent to:** ANS 408
**Course typically offered:**
Main Campus: Fall, Spring
Online Campus: Spring

**Enrollment requirement:** CHEM 241A and (PSIO 380 or PSIO 202) and NSC 308. Prerequisite or concurrent enrollment in BIOC 384 OR BIOC 385.
**Writing Emphasis:** Writing Emphasis Course

**NSC 410: Applied Nutrition and Disease** (3 units)
**Description:** It is well established that diet plays a significant role in disease treatment and prevention. This course will review pathophysiology of nutrition-related diseases, including corresponding nutrition and other lifestyle prevention and intervention strategies. Emphasis will be placed on practical application of nutrition therapy as it applies to health and wellness professionals. Basic behavior change strategies to promote healthy lifestyle choices will also be discussed. This course is for students pursuing non-dietetics health and wellness professions, and is open to Nutritional Sciences majors in the Nutrition option.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Fall, Spring
Online Campus: Fall

**Enrollment requirement:** NSC 308 and (PSIO 202 or PSIO 380). NSC majors and those within the nutrition emphasis only. Must not have taken NSC 310.

**NSC 415L: Advanced Sports Nutrition Lab** (1 unit)
**Description:** NSC 415/515 Lab will use nutritional science and physiology to focus on sport specific menu and food needs for athletes. Content will include menu development and analysis of various menus, recipes and cookbooks designed for athletes. This will encompass designing specific food products and menus that are appropriate for specific sport activities that have special nutritional challenges during training and competition. This course will also include training on dietary and body composition assessment tools, allowing students to use that knowledge while assessing both body composition and food intake of an athlete.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Flat Fee:** $35
**Course Components:** Laboratory Required
**Co-convened with:** NSC 515L
**Course typically offered:**
Main Campus: Fall

**Enrollment requirement:** NSC 315. Concurrently enrolled in NSC 415R or 515R.

**-SA** represents a Student Abroad & Student Exchange offering
**-CC** represents a Correspondence Course offering
**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NSC 415R: Advanced Sports Nutrition** (3 units)
**Description:** NSC 415R/515R will use nutritional science and physiology to focus on sport specific competition and training nutritional challenges and issues. Content will include the nutritional and physiological requirements of various sports; sport specific cultural influences that affect attitudes towards nutrition; and nutritional challenges faced by athletes training and competing in different sports. This course will also include a review of dietary intake methodologies; body composition assessment; diet analysis; and training table and residence hall menu development and assessment.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Co-convened with:** NSC 515R
**Course typically offered:**
Main Campus: Fall

**Enrollment requirement:** NSC 315. Concurrently enrolled in NSC 415L or 515L.

**NSC 420: Nutrition Education and Counseling** (2 units)
**Description:** Application of counseling & learning theories with individuals and groups in clinical and community settings. Includes discussion and experience in interviewing, counseling, dietary assessment methodology, learning activities, evaluation and documentation.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Laboratory May Be Offered
Lecture Required
**Course typically offered:**
Main Campus: Spring

**Enrollment requirement:** Major: Nutritional Sciences- Dietetics option only. NSC 325 and NSC 425.

**-SA** represents a Student Abroad & Student Exchange offering
**-CC** represents a Correspondence Course offering
**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NSC 425: Medical Nutrition Therapy I** (4 units)
**Description:** This class, the second in the clinical nutrition series, will build upon the Foundations in Medical Nutrition Therapy (NSC 325) course. The application of basic nutrition science principles in the selection of the appropriate medical nutrition therapies related to the nutrition care process and cardiovascular, pulmonary, endocrine, and gastrointestinal disorders will be investigated. Continued development of knowledge and skills through applying the appropriate Academy of Nutrition & Dietetic Association's (AND) international standardized terminology and the use of medical terminology as it relates to health, disease and MNT will also be achieved.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Fall

**Enrollment requirement:** Dietetics Option within the Nutritional Sciences major. PSIO 202, NSC 325, and prerequisite or concurrent enrollment in BIOC 384 or BIOC 385.

**NSC 430L: Advanced Food Science & Microbiology Laboratory** (2 units)
**Description:** This course is designed to provide students with the opportunity to pursue advanced techniques related to food science and food microbiology. These laboratory techniques will enable students to objectively evaluate food qualities, microbial activity and sensory attributes. The class will begin with classroom instruction and lab exercises covering the principles of advanced food microbiology and food chemistry as well as lab principles, procedures, and practices. It will provide an understanding of food processing whether it be thermal, dehydration, low water activity (aw), or acidification and the controls of the process that make the product safe such as temperature, pH, moisture content, aw, or a combination. The interactions between microorganisms and process variables will be used to confirm the commercial safety of the food. Additionally, the students will gain an understanding of the importance of shelf-life on marketability and also how packaging and ingredient options play a role in improving texture and flavor as well as microbial stability during storage. After basic lab exercises to reinforce initial lecture content are covered, in groups of two or three, students will develop a project to pursue for their lab work for the rest of the course. They will develop a product, analyze it for quality attributes and microbial activity during storage, and determine its shelf-life. The product should also have market appeal.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Laboratory Required
**Also offered as:** MIC 430L
**Co-convened with:** NSC 530L
**Course typically offered:**
Main Campus: Fall

**Home department:** Veterinary Science & Microbiology

**-SA** represents a Student Abroad & Student Exchange offering
**-CC** represents a Correspondence Course offering
**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NSC 435: Medical Nutrition Therapy II** (4 units)
**Description:** This class, the last in the clinical nutrition series, will build upon the knowledge and skills related to the nutrition care process obtained in the Medical Nutrition Therapy I (NSC 425) course. The application of basic nutrition science principles in the selection of the appropriate medical nutrition therapies related to the nutrition care process and renal, neurology, cancer, hypermetabolism/critical care, and immune disorders will be investigated. Continued development of knowledge and skills through applying the appropriate Academy of Nutrition & Dietetic Association's (AND) international standardized terminology and the use of medical terminology as it relates to health, disease and MNT in advanced clinical scenarios will also be achieved.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Spring

**Enrollment requirement:** Dietetics Option within the Nutritional Sciences major. NSC 425.

**NSC 444: Community Nutrition** (3 units)
**Description:** This course is an in depth look at how the RD/nutritionist works in the community, by providing hands-on experience in teaching nutrition in a community setting. The course will cover areas such as determining needs for nutrition education, public policy, various nutrition programs, funding and grant writing, and communication skills needed for various audiences.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Spring

**Enrollment requirement:** Major: Nutritional Sciences- Dietetics option only. NSC 301 and NSC 425.

**NSC 445: Assessment and Regulation of Human Body Composition** (3 units)
**Description:** This course explores the theoretical and applied aspects of body composition assessment methods. Students will learn about the limitations and usefulness of laboratory and field methods of assessing body composition in healthy, clinical and athletic population subgroups. The considerations for application of body composition assessment in growth, development as well as aging will be addressed. Students will learn to perform basic anthropometric measures and compute reliability. Students will practice critically evaluating current research related to body composition assessment in a variety of subpopulations.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Co-convened with:** NSC 545
**Course typically offered:**
Main Campus: Fall
Online Campus: Fall

**Enrollment requirement:** (NSC 101 or NSC 170C1) and PSIO 202.

**NSC 455: Study Abroad: The Mediterranean Diet and Health** (6 units)
**Description:** The Mediterranean dietary pattern has a well-established beneficial role in health promotion. Epidemiologic studies reveal the protective role of adherence to this pattern on overall cancer incidence and mortality, prevention of obesity, type II diabetes, and cardiovascular diseases. On November 17, 2010, UNESCO recognized this diet pattern as an Intangible Cultural Heritage of Italy, Greece, Spain and Morocco, thus recognizing this Mediterranean component of life style as a contribution to the world. Objectives of this Summer Program include: 1) Provide students with information about the health benefits of foods associated with a Mediterranean diet and for the prevention of chronic diseases;2) Review and discuss the influence of bioactive compounds present in Mediterranean foods on metabolic pathways;3) Provide students with an opportunity to learn about the food industry in Italy and Mediterranean area;4) Acquire hands-on experience with food preparation;5) Experience the cultural diversity of Italy and influence of Mediterranean culture.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Summer

**Recommendations and additional information:** NSC 101.

**NSC 458: Food Service Organization and Management** (3 units)
**Description:** Organization and management of food service systems; responsibilities of management for leadership, sanitation, maintenance, and care of food service plant and its equipment.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Fall

**Enrollment requirement:** Major: Nutritional Sciences- Dietetics Option only. N_SC 358R and N_SC 358L.

**NSC 475: Nutrigenomics for the Study of Disease Prevention & Intervention** (3 units)
**Description:** Nutrigenomics is the application of genomics to human nutrition. This online course will explore relevant technologies, genetics and nutrition. Designed by researchers in colleges and centers of excellence, it will be continually updated with the latest information.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Co-convened with:** N_SC 575
**Course typically offered:**
Main Campus: Fall
Online Campus: Fall

**Recommendations and additional information:** MCB 181R, MCB 181L, BIOC 460, NSC 308, MATH 112.
**Enrollment requirement:** Completion of NSC 101 or NSC 170C1 and BIOC 384 or BIOC 385 or BIOC 462A

**NSC 478: Public Health Nutrition** (3 units)
**Description:** This course is an analysis of nutrition issues concerned with health and disease. Biochemical, physiological and socioeconomic interactions will be evaluated as they relate to the development, implementation, monitoring and evaluation of nutrition programs and research that affect individuals across the lifespan.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Equivalent to:** N_SC 478
**Also offered as:** HPS 478
**Co-convened with:** NSC 578
**Course typically offered:**
Main Campus: Fall, Spring
Online Campus: Spring

**Home department:** Health Promotional Services
**Enrollment requirement:** HPS/CPH 200, HPS/CPH 350, and EPID 309.

**NSC 484: Fundamentals of Industrial and Environmental Health** (3 units)
**Description:** Introduction to the principles of occupational and environmental health, with emphasis on industrial hygiene aspects of recognition, evaluation, and control of environmental and industrial health hazards.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Equivalent to:** CE 484, MNE 484, OSH 484, PCOL 484, PHL 484
**Also offered as:** EHS 484, MNE 484, PCOL 484
**Co-convened with:** NSC 584
**Course typically offered:**
Main Campus: Fall

**Home department:** Community, Environment & Pol

**NSC 485: Biology of Radiation Therapy** (3 units)
**Description:** Offered every other year beginning Summer 2013. Over half of patients undergoing treatment for cancer will receive radiation therapy. This course will present concepts, theories, and principles of modern radiation biology with an emphasis placed on the biological consequences of radiation exposure. The physical properties of radiation and how it interacts with biological molecules will be discussed.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Lecture Required
**Co-convened with:** N_SC 585
**Recommendations and additional information:** MATH 110 or MATH 112.

**NSC 491: Preceptorship** (1 - 6 units)
**Description:** Specialized work on an individual basis, consisting of instruction and practice in actual service in a department, program, or discipline. Teaching formats may include seminars, in-depth studies, laboratory work and patient study.
**Grading basis:** Alternative Grading: S, P, F
**Career:** Undergraduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated for a maximum of 6 units.
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

**NSC 492: Directed Research** (1 - 3 units)
**Description:** Directed Research Course is the practical application, on an individual basis, of previously studied theory and the collection of data for future theoretical interpretation). The first student in N SC for the UMPIRE program will study the effects of high levels of iron on parameters of iron metabolism in metabolism in mosquito immune cells.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Independent Study Required
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

**NSC 493: Internship** (1 - 6 units)
**Description:** Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.
**Grading basis:** Alternative Grading: S, P, F
**Career:** Undergraduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated a maximum of 1 times.
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

**NSC 495A: Dietetic Internship Preparation** (1 unit)
**Description:** The purpose of this course is to prepare senior Dietetic majors for the Dietetic Internship. Students will learn about the Dietetic Internship application process and what to expect during the supervised practice experience.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Colloquium Required
**Course typically offered:**
Main Campus: Fall

**Recommendations and additional information:** For senior dietetic majors only,

**-SA** represents a Student Abroad & Student Exchange offering
**-CC** represents a Correspondence Course offering
**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NSC 497A: Applied Sports Nutrition Workshop** (3 units)
**Description:** The NSC Applied Sports Nutrition Workshop will provide students with the opportunity for hands-on experiential learning in the field of Sports Nutrition. Sports Nutrition students will learn to conduct dietary intake assessments; practice menu development for athlete training tables, create recipe nutrient analyses, and observe University athlete training tables; create sports nutrition cooking demonstrations and nutrition education materials/presentations for athletes; learn and practice body composition assessment and analysis techniques; and observe athletes during training to better understand the physical demands of various sports. The program instructor and rotation leaders work closely with student participants to develop sports nutrition skill sets to compliment career aspirations within the sports and fitness nutrition industry.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Workshop Required
**Enrollment requirement:** Completion of NSC 415R/L prior to enrollment.

**NSC 497B: Medical Nutrition Therapy Workshop** (1 unit)
**Description:** The NSC Medical Nutrition Therapy (MNT) Workshop will provide students with the opportunity for hands-on experiential learning in the field of MNT. Students will be assigned a variety of hands-on patient or client activities throughout the semester to strengthen their skills in applying MNT principles, developing competency to complete a comprehensive nutrition-focused physical assessment, strengthening communication and collaboration strategies, strengthening research skills related to research methodology, and interpretating of research literature and integration of research principles into evidence-based MNT practice.Students will meet weekly throughout the semester to review their patient interactions and nutrition care plan with the Instructor. Students will also participate in monthly patient care rounds where they will be required to present or describe their patient/client interactions related to that month. Students will also participate in journal club monthly to review and discuss assigned journal articles on MNT relevant topics. Students will also participate in 1 group community presentation during the semester. Students will be required to sign a Health Insurance Portability and Accountability (HIPAA) agreement.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Workshop Required
**Course typically offered:**
Main Campus: Fall, Spring

**Recommendations and additional information:** This course requires students to work on-site at an organization in their community.
**Enrollment requirement:** Completion of NSC 325 and NSC 395A prior to enrolling in this course.

**NSC 497C: Competency and Compassion Development for Health Majors; The "Body Positive" Concept** (1 unit)
**Description:** An in-depth exploration and understanding of the "body positive" concept. Many people today struggle with body dissatisfaction and eating-related problems. This course explores the complex reasons why the struggle with body image is so prevalent, and how this can be challenged. This class is designed to improve on the overall quality of compassionate health care that can be provided, through professional development and personal growth. This unique opportunity offers a weekly class encouraging shared ideas about health, beauty, identity, and diversity, along with a hands-on experiential out-of-classroom component for learning.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Workshop Required
**Course typically offered:**
Main Campus: Fall, Spring

**Student Engagement Activity:** Community Partnership
**Student Engagement Competency:** Professionalism

**NSC 497F: Community and School Garden Workshop** (2 - 6 units)
**Description:** This workshop-based course is designed to enable UA undergraduate and graduate students to work in Tucson-area schools and community sites helping stakeholders to plant, harvest and prepare foods from their garden as well as use the garden as a learning space. As a member of a school or community garden team, students are likely to cover a wide range of activities from maintaining a compost pile to administering lesson plans for teaching in the garden to weeding, planting, and organizing work crews. In addition to attending one 3-hour weekend workshop, students are required to attend weekly class meetings on the UA campus. Most of the course, however, revolves around independent and sustained involvement with a Tucson school or community garden. No teaching or gardening experience is required.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Workshop Required
**Repeatable:** Course can be repeated for a maximum of 9 units.
**Also offered as:** AIS 497F, ENVS 497F, GEOG 497F, HPS 497F, LAS 497F, PLS 497F, STCH 497F, TLS 497F
**Co-convened with:** NSC 597F
**Course typically offered:**
Main Campus: Fall, Spring

**Home department:** School of Geography and Development
**Student Engagement Activity:** Community Partnership
**Student Engagement Competency:** Sustainability

**NSC 498: Senior Capstone** (1 - 3 units)
**Description:** A culminating experience for majors involving a substantive project that demonstrates a synthesis of learning accumulated in the major, including broadly comprehensive knowledge of the discipline and its methodologies. Senior standing required.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Independent Study Required
**Course typically offered:**
Main Campus: Fall, Spring

**NSC 498H: Honors Thesis** (3 units)
**Description:** An honors thesis is required of all the students graduating with honors. Students ordinarily sign up for this course as a two-semester sequence. The first semester the student performs research under the supervision of a faculty member; the second semester the student writes an honors thesis.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated for a maximum of 9 units.
**Course typically offered:**
Main Campus: Fall, Spring

**Enrollment requirement:** Student must be active in the Honors College.
**Honors Course:** Honors Course
**Honors Course:** Honors Course
**Writing Emphasis:** Writing Emphasis Course

**NSC 499: Independent Study** (1 - 9 units)
**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work.
**Grading basis:** Alternative Grading: S, P, F
**Career:** Undergraduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated a maximum of 99 times.
**Course typically offered:**
Main Campus: Fall, Spring

**NSC 499H: Honors Independent Study** (1 - 6 units)
**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work.
**Grading basis:** Regular Grades
**Career:** Undergraduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated for a maximum of 12 units.
**Course typically offered:**
Main Campus: Fall, Spring

**Enrollment requirement:** Student must be active in the Honors College.
**Honors Course:** Honors Course
**Honors Course:** Honors Course

**NSC 501: Statistics for Applied Nutritional Sciences I** (1 unit)
**Description:** This course will introduce the concepts of research methods with a focus on the varied research conducted in nutritional sciences. Students will be guided through a comprehensive compendium of the elements of research design in order to understand the application of these elements to Applied Nutritional Science.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Summer
Online Campus: Summer

**NSC 502: Statistics for Applied Nutritional Sciences II** (1 unit)
**Description:** This course will introduce basic statistical concepts and applied statistical strategies that are essential for conducting and critiquing research in nutritional sciences and related fields. The course will be delivered online structured with video lectures, self-check practices, discussion forum, assignments and quizzes. The experiences within the course will provide students the necessary competencies to appropriately summarize data (descriptive statistics) and implement statistical tests (inferential statistics) based upon appreciation of research design and data characteristics. All the analyses will be taught using an established statistical software program IBM SPSS Statistics 20. Some of the simple analyses will also be demonstrated using excel as an alternative.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Fall

**Recommendations and additional information:** NSC 501 needs to be completed prior to enrolling in NSC 502.

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**-CC** represents a Correspondence Course offering
**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NSC 503: Statistics for Applied Nutritional Sciences III** (1 unit)
**Description:** This course will provide students with practical research scenarios and data sets on which to practice statistical techniques commonly used in nutritional sciences research such as t-statistic for mean comparisons, ANOVA and factorial ANOVA, regression modeling for continuous data, categorical data, count data and percentage data, and repeated measures analysis for longitudinal data. Non-parametric techniques, mixed linear modeling and power analysis will also be discussed.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Spring

**Enrollment requirement:** Completion of NSC 501 and NSC 502 prior to enrollment.

**NSC 509: Advanced Nutrition Metabolism and Disease** (3 units)
**Description:** This class will review the multi-facets of macronutrient metabolism and application to the prevention and development of common chronic diseases. The clinical applications of nutrient deficiencies and toxicities will also be reviewed. Metabolic alterations associated with obesity, metabolic syndrome, and other diseases will be discussed. The application of evidence-based guidelines and research for nutritional interventions will be discussed through weekly readings and assignments.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Summer
Online Campus: Summer

**Recommendations and additional information:** NSC 501

**NSC 515L: Advanced Sports Nutrition Lab** (1 unit)
**Description:** NSC 415/515 Lab will use nutritional science and physiology to focus on sport specific menu and food needs for athletes. Content will include menu development and analysis of various menus, recipes and cookbooks designed for athletes. This will encompass designing specific food products and menus that are appropriate for specific sport activities that have special nutritional challenges during training and competition. This course will also include training on dietary and body composition assessment tools, allowing students to use that knowledge while assessing both body composition and food intake of an athlete. Graduate students will be required to complete an additional project described in syllabus.
**Grading basis:** Regular Grades
**Career:** Graduate
**Flat Fee:** $35
**Course Components:** Laboratory Required
**Co-convened with:** NSC 415L
**Course typically offered:**
Main Campus: Fall
Online Campus: Fall

**Enrollment requirement:** Concurrently enrolled in NSC 415R or 515R.

**NSC 515R: Advanced Sports Nutrition** (3 units)
**Description:** NSC 415R/515R will use nutritional science and physiology to focus on sport specific competition and training nutritional challenges and issues. Content will include the nutritional and physiological requirements of various sports; sport specific cultural influences that affect attitudes towards nutrition; and nutritional challenges faced by athletes training and competing in different sports. This course will also include a review of dietary intake methodologies; body composition assessment; diet analysis; and training table and residence hall menu development and assessment. Graduate students will be required to complete a research project described in syllabus.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Co-convened with:** NSC 415R
**Course typically offered:**
Main Campus: Fall
Online Campus: Fall

**Enrollment requirement:** Concurrently enrolled in NSC 415L or 515L.

**NSC 519: Advanced Applied Nutritional Sciences** (3 units)
**Description:** This course will advance understanding of research design, methods, and implementation, interpretation of research findings, and advances in nutrition science research for selected chronic diseases.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Summer
Online Campus: Summer

**Recommendations and additional information:** NSC 501 and NSC 509.

**NSC 530L: Advanced Food Science & Microbiology Laboratory** (2 units)
**Description:** This course is designed to provide students with the opportunity to pursue advanced techniques related to food science and food microbiology. These laboratory techniques will enable students to objectively evaluate food qualities, microbial activity and sensory attributes. The class will begin with classroom instruction and lab exercises covering the principles of advanced food microbiology and food chemistry as well as lab principles, procedures, and practices. It will provide an understanding of food processing whether it be thermal, dehydration, low water activity (aw), or acidification and the controls of the process that make the product safe such as temperature, pH, moisture content, aw, or a combination. The interactions between microorganisms and process variables will be used to confirm the commercial safety of the food. Additionally, the students will gain an understanding of the importance of shelf-life on marketability and also how packaging and ingredient options play a role in improving texture and flavor as well as microbial stability during storage. After basic lab exercises to reinforce initial lecture content are covered, in groups of two or three, students will develop a project to pursue for their lab work for the rest of the course. They will develop a product, analyze it for quality attributes and microbial activity during storage, and determine its shelf-life. The product should also have market appeal.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Laboratory Required
**Also offered as:** MIC 530L
**Co-convened with:**
**Course typically offered:**
Main Campus: Fall

**Home department:** Veterinary Science & Microbiology

**NSC 542: Advanced Medical Nutrition Therapy** (3 units)
**Description:** This course focuses on providing medical nutrition therapy for select complex acute and chronic diseases. The course is based on students participating in an in-depth examination and discussion on each topic using an evidence-based approach and related research. Using an online forum, students will discuss assigned topics applying analytic skills to provide robust discussions. Students will also present their research on an assigned topic.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Fall
Online Campus: Fall

**Recommendations and additional information:** Students should take NSC 501, NSC 509 and NSC 519 prior to taking this course.

**NSC 545: Assessment and Regulation of Human Body Composition** (3 units)
**Description:** This course explores the theoretical and applied aspects of body composition assessment methods. Students will learn about the limitations and usefulness of laboratory and field methods of assessing body composition in healthy, clinical and athletic population subgroups. The considerations for application of body composition assessment in growth, development as well as aging will be addressed. Students will learn to perform basic anthropometric measures and compute reliability. Students will practice critically evaluating current research related to body composition assessment in a variety of subpopulations.In addition to the quizzes, discussions, assignments and project, graduate students will write at least two study abstracts for each learning module; 10 total. These abstracts will be used to develop the required graduate student review paper (15 references minimum) on new developments in body composition.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Co-convened with:** NSC 445
**Course typically offered:**
Main Campus: Fall
Online Campus: Fall

**NSC 560: International Nutrition** (3 units)
**Description:** Fundamentals of biochemistry, including proteins, enzymes, carbohydrates and lipids and their metabolic relationships.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Equivalent to:** N_SC 560, PHL 560
**Also offered as:** HPS 560
**Course typically offered:**
Main Campus: Spring

**Home department:** Health Promotional Services

**NSC 561: Communicating Nutritional Sciences** (1 unit)
**Description:** Students will gain the ability to craft effective scientific presentations, abstracts, manuscripts, and proposals; practice oral communication in front of an audience and learn (and practice) the peer review process. Students will complete the course with a fundamental understanding of the elements of effective scientific communication, and how to apply these elements to craft effective nutrition science-focused oral presentations (short oral and posters) (Module 1), abstracts, public health relevance statements, and lay summaries (Module 2); manuscripts and grant proposals (Module 3); and constructive and effective evaluation of peers' work will be discussed throughout.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Repeatable:** Course can be repeated a maximum of 2 times.
**Course typically offered:**
Main Campus: Spring

**NSC 575: Nutrigenomics for the Study of Disease Prevention & Intervention** (3 units)
**Description:** Nutrigenomics is the application of genomics to human nutrition. This online course will explore relevant technologies, genetics & nutrition. Designed by researchers in colleges & centers of excellence, it will be continually updated with the latest information. Graduate-level requirements include 1/14 Nutrigenomics/Organization of the genome; 4/13 Advanced Models; 4/20 Target validation; 4/27 Mouse models; lab assignments; Advanced discussion board quesitons (4 total) are due after each unit.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Co-convened with:** NSC 475
**Course typically offered:**
Main Campus: Fall
Online Campus: Fall

**-SA** represents a Student Abroad & Student Exchange offering
**-CC** represents a Correspondence Course offering
**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NSC 578: Public Health Nutrition** (3 units)
**Description:** This course is an analysis of nutrition issues concerned with health and disease. Biochemical, physiological and socioeconomic interactions will be evaluated as they relate to the development, implementation, monitoring and evaluation of nutrition programs and research that affect individuals across the lifespan. Graduate-level requirements include and additional research topic.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Equivalent to:** N_SC 578
**Also offered as:** HPS 578
**Co-convened with:** NSC 478
**Course typically offered:**
Main Campus: Fall

**Home department:** Health Promotional Services

**NSC 584: Fundamentals of Industrial and Environmental Health** (3 units)
**Description:** Introduction to the principles of occupational and environmental health, with emphasis on industrial hygiene aspects of recognition, evaluation, and control of environmental and industrial health hazards. Graduate-level requirements include a comprehensive paper detailing hazards associated with a particular health hazard.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Equivalent to:** CE 584, OSH 584, PCOL 584
**Also offered as:** EHS 584, PCOL 584
**Co-convened with:**
**Course typically offered:**
Main Campus: Fall

**Home department:** Community, Environment & Pol

**NSC 585: Biology of Radiation Therapy** (3 units)
**Description:** Offered every other year beginning Summer 2013. Over half of patients undergoing treatment for cancer will receive radiation therapy. This course will present concepts, theories, and principles of modern radiation biology with an emphasis placed on the biological consequences of radiation exposure. The physical properties of radiation and how it interacts with biological molecules will be discussed.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Co-convened with:** NSC 485
**Course typically offered:**
Main Campus: Summer

**NSC 593: Internship** (1 - 6 units)
**Description:** Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.
**Grading basis:** Alternative Grading: S, P, F
**Career:** Graduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated a maximum of 99 times.
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

**NSC 595: Emerging Topics in Nutritional Sciences** (1 unit)
**Description:** This colloquium offers an opportunity for graduate students to interact closely with research faculty of the Nutritional Sciences Graduate Program in their current research interest areas. The course is designed to help graduate students appreciate within each research area how the scientific community advances knowledge and understanding of nutrition. Over the scope of a semester, research within 3 current topic areas will be critically examined; each topic area will be given 4-6 weeks and led by a Nutritional Sciences faculty doing research in that area. Two of the topic areas will change annually to incorporate the diverse research conducted related to nutrition. The general format for a topic area is described below.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Colloquium Required
**Repeatable:** Course can be repeated a maximum of 4 times.
**Course typically offered:**
Main Campus: Spring

**NSC 595B: Special Topics in Nutrition** (1 - 3 units)
**Description:** This short course will examine current, rapidly changing topics of immediate relevance to Nutritional Sciences. The topic selected will be presented from different perspectives incorporating cutting edge basic, clinical and translational science and will provide information that addresses the prevention and treatment of a nutrition condition where appropriate. An example of a topic would be "The Analysis and Treatment of Obesity."
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Colloquium Required
**Repeatable:** Course can be repeated a maximum of 4 times.
**Course typically offered:**
Main Campus: Fall, Spring

**Field trip:** Field trips.

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**-CC** represents a Correspondence Course offering
**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NSC 597: Capstone Prep Workshop** (1 unit)
**Description:** The Capstone Workshop course is designed to help students: identify potential sites for their capstone courses, develop talking points when discussing the capstone with potential sites, obtain the required affiliation requirements with their site, build knowledge of research requirements through completion of CITI trainings and further develop presentation and writing skills.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Workshop Required
**Course typically offered:**
Main Campus: Fall, Spring, Summer

**NSC 597F: Community and School Garden Workshop** (2 - 6 units)
**Description:** This workshop-based course is designed to enable UA undergraduate and graduate students to work in Tucson-area schools and community sites helping stakeholders to plant, harvest and prepare foods from their garden as well as use the garden as a learning space. As a member of a school or community garden team, students are likely to cover a wide range of activities from maintaining a compost pile to administering lesson plans for teaching in the garden to weeding, planting, and organizing work crews. In addition to attending one 3-hour weekend workshop, students are required to attend weekly class meetings on the UA campus. Most of the course, however, revolves around independent and sustained involvement with a Tucson school or community garden. No teaching or gardening experience is required.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Workshop Required
**Repeatable:** Course can be repeated for a maximum of 9 units.
**Also offered as:** AIS 597F, ENVS 597F, GEOG 597F, LAS 597F, PLS 597F, STCH 597F, TLS 597F
**Co-convened with:** NSC 497F
**Course typically offered:**
Main Campus: Fall, Spring

**Home department:** School of Geography and Development

**NSC 599: Independent Study** (1 - 5 units)
**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work. Graduate students doing independent work which cannot be classified as actual research will register for credit under course number 599 or 699.
**Grading basis:** Alternative Grading: S, P, F
**Career:** Graduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated a maximum of 99 times.
**Course typically offered:**
Main Campus: Fall

**-SA** represents a Student Abroad & Student Exchange offering
**-CC** represents a Correspondence Course offering
**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NSC 602: Metabolic Integration** (3 units)
**Description:** [Taught alternate even-numbered years]. Analysis of current knowledge regarding the interactions between the intake, absorption, transport, processing, storage, catabolism and excretion of nutrients and the regulation of metabolic homeostasis in the intact organism. Emphasis areas include interrelationships between protein, carbohydrate and fat metabolism and their regulation by dietary, hormonal and genetic factors in humans.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Fall

**Recommendations and additional information:** BIOC 460 or BIOC 462A - BIOC 462B.

**NSC 608: Bioenergetics & Metabolism** (3 units)
**Description:** This in-class course will deliver information related to bioenergetics and metabolism in normal and diseased states. Research data from pre-clinical and clinical studies clearly indicate that nutrients metabolism plays an important role in determining the development of chronic diseases including obesity and cancer. Given the large percentage of U. S. adults being overweight (~65%) or obese (~33%), and the fact the incidence of chronic diseases (i.e. cancer, diabetes, inflammation) increases with aging, it is important for graduate students to acquire in depth knowledge of how lifestyle and nutrients contribute to energy balance, and how alterations in metabolic pathways influence the susceptibility to developing chronic diseases.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Fall

**Recommendations and additional information:** Completion of BIOC 462A and BIOC 462B.

**NSC 610: Nutrition and Disease** (3 units)
**Description:** The overall goal of this class is to improve students' understanding of how diet influences health and chronic disease risk by examining the biochemical and physiological effects of specific dietary components and overall dietary patterns. This course will use current research materials and in-depth examples-or case studies-of how nutrition can impact diabetes, inflammatory diseases, cardiovascular disease, and cancer.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Fall

**Recommendations and additional information:** An understanding of basic biochemistry (BIOC 462 or equivalent) and cell biology (MCB 410 or equivalent) is required for this course. Prior coursework/exposure in signal transduction pathways would be beneficial.

**NSC 624: Micronutrients** (3 units)
**Description:** This graduate-level course discusses the properties and metabolism of select vitamins and minerals in various species including the chemistry and biochemistry of how they function in organisms, and how deficiencies may result in pathological symptoms. The emphasis is on understanding the basic properties of the vitamins and minerals and their role in nutrition. The application of this knowledge to clinical nutrition will be discussed. Topics include: chemistry and nomenclature, methods of analysis, absorption, transport and storage, metabolism, functions, deficiencies, and toxicities.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Fall

**NSC 645: Nutritional Epidemiology** (3 units)
**Description:** An overview of the current issues and methods in assessing nutritional status in epidemiological studies. Issues and methods used in international studies and of chronic disease nutrition will be covered.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Repeatable:** Course can be repeated a maximum of 2 times.
**Equivalent to:** CPH 645, EPI 645, NUSC 645, N_SC 645, PHL 645
**Also offered as:** EPID 645
**Course typically offered:**
Main Campus: Spring

**Recommendations and additional information:** EPID 573A. Statistics helpful.
**Home department:** Epidemiology and Biostatistics

**-SA** represents a Student Abroad & Student Exchange offering
**-CC** represents a Correspondence Course offering
**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NSC 675: Advanced Nutrigenomics** (3 units)
**Description:** By understanding the interaction of nutrients or bioactive food compounds with genes, there exists a great potential to personalize and optimize diet for improved human health at an individual or population level. The focus of this class is the application of Nutrigenomics by understanding how providing or restricting the proper food components affects homeostasis in the body at the biochemical and organ systems levels. The ability for nutritionists and healthcare professionals to create an optimal diet requires an understanding of how interactions between nutrients and genes, proteins and metabolic pathways regulate disease pathways. Student obtaining contemporary nutrition training must understand genetic interactions as well as current techniques, mechanisms and data analysis used in modern science and clinical practices.
**Grading basis:** Regular Grades
**Career:** Graduate
**Course Components:** Lecture Required
**Course typically offered:**
Main Campus: Fall

**Recommendations and additional information:** Completion of MCB 410, BIOC 462A or BIOC 462B or equivalent.

**NSC 698A: Capstone/Final Project I** (3 units)
**Description:** Capstone/Final Project I consists of 135 hours of practical professional training with a sponsoring agency/facility. Students will conduct a needs assessment and propose a topic for final project to be completed in NSC 698B. Students will write a progress report which will be presented to the class.
**Grading basis:** Alternative Grading: S, P, F
**Career:** Graduate
**Course Components:** Independent Study Required
**Course typically offered:**
Main Campus: Fall, Spring, Summer

**Enrollment requirement:** NSC 597.

**NSC 698B: Capstone/Final Project II** (3 units)
**Description:** Capstone/Final Project II consists of 135 hours of practical professional training with a sponsoring agency/facility that culminates the Professional Science Master's program and produces a final project. Students will develop a final report on the project objectives, methods, and outcomes. The project will be presented to the class in a presentation form, and a poster will also be produced.
**Grading basis:** Alternative Grading: S, P, F
**Career:** Graduate
**Course Components:** Independent Study Required
**Course typically offered:**
Main Campus: Fall, Spring, Summer

**Enrollment requirement:** NSC 698A.

**NSC 699: Independent Study** (1 - 5 units)
**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work. Graduate students doing independent work which cannot be classified as actual research will register for credit under course number 599 or 699.
**Grading basis:** Alternative Grading: S, P, F
**Career:** Graduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated a maximum of 99 times.
**Course typically offered:**
Main Campus: Fall, Spring

**NSC 900: Research** (1 - 4 units)
**Description:** Individual research, not related to thesis or dissertation preparation, by graduate students.
**Grading basis:** Alternative Grading: S, P, F
**Career:** Graduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated a maximum of 99 times.
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

**NSC 909: Master's Report** (1 - 8 units)
**Description:** Individual study or special project or formal report thereof submitted in lieu of thesis for certain master's degrees.
**Grading basis:** Alternative Grading: S, P, F
**Career:** Graduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated a maximum of 99 times.
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

**NSC 910: Thesis** (1 - 10 units)
**Description:** Research for the master's thesis (whether library research, laboratory or field observation or research, artistic creation, or thesis writing). Maximum total credit permitted varies with the major department.
**Grading basis:** Alternative Grading: S, P, F
**Career:** Graduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated a maximum of 99 times.
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

**NSC 920: Dissertation** (1 - 9 units)
**Description:** Research for the doctoral dissertation (whether library research, laboratory or field observation or research, artistic creation, or dissertation writing).
**Grading basis:** Alternative Grading: S, P, F
**Career:** Graduate
**Course Components:** Independent Study Required
**Repeatable:** Course can be repeated a maximum of 99 times.
**Course typically offered:**
Main Campus: Fall, Winter, Spring, Summer

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**-CC** represents a Correspondence Course offering
**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.