Nutrition Science

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Theresa Patnode Santmann School of Health Sciences

Bachelor of Science Degree

The Nutrition Science baccalaureate degree contains a strong scientific base that is applied throughout the curriculum. It is designed for students interested in nutrition, food, and the relationship of diet to human health, fitness, and disease prevention—for which current interest has never been greater than today. Graduates will learn to examine complex relationships in human nutrition and food technology. Course work includes understanding obesity and weight management, nutritional influences on chronic disease, dietary intake patterns, addressing nutrient industry and marketing trends, and food/nutrient recommendations to protect the population and promote optimum health.

Graduates will be prepared for further academic professional studies or graduate school including medical, dental, occupational/physical therapy, pharmacy, and advanced graduate study in nutrition science. The nutrition science program is independent of the licensure in dietetics and cannot be used to directly achieve clinical internships.*

*Please note: The Nutrition Science degree does not lead to becoming a licensed dietitian after graduation. If you are interested in becoming a Registered Dietitian, it is vital that you understand the additional education requirements determined by the Accreditation Council for Education in Nutrition and Dietetics (ACEND). This Nutrition Science degree provides a strong science and nutrition background for other allied health care settings and work in both the private and public sectors.

Typical Employment Opportunities

Graduates are eligible for a variety of careers in both private and public sectors.
Opportunities found in, but not limited to:
Healthcare Field
Sport & Fitness Industry
Food Technology
Biomedical and Laboratory Research
County, State and Federal Government Nutrition Services
Cooperative Extension
Food and Agriculture Industry
Nutraceutical Industry
Non-Profit Nutritional Support Programs
Graduate Education

Nutrition Science (BS) Program Outcomes:

- Graduates will demonstrate professional and personal ethics with a cultural awareness for dietary intake and skills in maintaining health and disease prevention throughout the life span (Professionalism/Leadership).
- Graduates will employ effective oral and written communication skills (Communication/Marketing).
- Graduates will apply critical thinking skills to evaluate, interpret, and analyze current issues in nutrition utilizing theoretically based problem solving skills (Critical Thinking).
- Graduates will be able to investigate, differentiate, and extrapolate nutrition science data and trends. This will allow them to excel in the nutrition sciences and to prepare for further professional and graduate education (Knowledge).

### Liberal Arts and Sciences (36 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EGL 101 Composition I: College Writing (GE)</td>
<td>3</td>
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<tr>
<td>EGL 102 Composition II: Writing About Literature</td>
<td>3</td>
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<tr>
<td>American/Other World/Western Civilization History (GE)</td>
<td>3</td>
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<tr>
<td>PSY 101 Introduction to Psychology (GE)</td>
<td>3</td>
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<tr>
<td>BIO 130 Biological Principles I (GE)</td>
<td>4</td>
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<tr>
<td>Humanities (GE)</td>
<td>3</td>
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<tr>
<td>SOC 122 Introductory Sociology (GE)</td>
<td>3</td>
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<tr>
<td>MTH 116 Algebra (GE)</td>
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<td>BIO 131 Biological Principles II (GE)</td>
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<td>Foreign Language (GE)</td>
<td>3</td>
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<td>Arts (GE)</td>
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### Required: Lower Division (37 credits)

<table>
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<tr>
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<tr>
<td>BIO 170 Human Anatomy and Physiology I (GE)</td>
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<tr>
<td>CHM 152 General Chemistry Principles I (GE)</td>
<td>4</td>
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<tr>
<td>BUS 131 Marketing Principles</td>
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<td>BIO 125/NTR 110 Introduction to Nutrition Science</td>
<td>3</td>
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<tr>
<td>CHM 260 Fundamentals of Organic Chemistry (GE)</td>
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<tr>
<td>BIO 220 Medical Microbiology w/Lab OR</td>
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<tr>
<td>NTR 330 Food Microbiology</td>
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<td>NTR 200 Food Science w/Lab</td>
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<tr>
<td>Technical Electives Lower Level*</td>
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### Required: Upper Division (49 credits)

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<th>Course</th>
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<tr>
<td>NTR 300 Cultural Foods</td>
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<tr>
<td>NTR 310 Food Service Management</td>
<td>3</td>
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<tr>
<td>NTR 320 Medical Nutritional Therapy w/lab</td>
<td>4</td>
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<td>NTR 325 Nutrition Through the Life Cycle</td>
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<td>NTR 335 Nutritional Biochemistry</td>
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<td>NTR 340 Nutrition Communication</td>
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<td>NTR 350 Energy and Exercise</td>
<td>3</td>
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<td>NTR 405 Supplements &amp; Ergogenic Aids</td>
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<tr>
<td>NTR 411 Micronutrient Metabolism</td>
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<td>NTR 420 Community Nutrition</td>
<td>3</td>
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<td>NTR 425 Nutrition Science Seminar</td>
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<td>NTR 450 Research Methods in Nutrition Sciences</td>
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<tr>
<td>Technical Elective Upper Level**</td>
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<td><strong>Total Credits:</strong></td>
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Degree Type: BS  
Total Required Credits: 122

Please refer to the General Education, Applied Learning, and Writing Intensive requirement sections of the College Catalog and consult with your advisor to ensure that graduation requirements are satisfied.

Notes:

*Technical Electives Lower Level

Must select one 3 cr. course

- NTR 150 Quantity Food Production  
- BIO 123 Human Body in Health and Disease  
- BIO 210 Introduction to Bioscience  
- BIO 240 Bioethics  
- BUS 101 Accounting I  
- BUS 109 Management Theories and Practices  
- BUS 259 Public Relations  
- BUS 267 Small Business Management  
- ECO 156 Principles of Economics – Macro  
- SOC 228 Society and Health  
- SOC 248 Sociology of Sports  
- SOC 260 Sociological Research Methods

**Technical Electives Upper Level
Must select two 3 cr. courses

- NTR 360 Experimental Foods
- NTR 365 Sports Nutrition
- NTR 430 Clinical Nutrition Assessment
- NTR 460 Nutrition Field Experience
- BIO 416 Industrial Microbiology
- BUS 305 Entrepreneurship
- ECO 304 Sports Economics
- ECO 310 Health Economics and Policy
- SOC 309 Sport in Society

Course Descriptions

**EGL 101 Composition I: College Writing (GE)**
This is the first part of a required sequence in college essay writing. Students learn to view writing as a process that involves generating ideas, formulating and developing a thesis, structuring paragraphs and essays, as well as revising and editing drafts. The focus is on the development of critical and analytical thinking. Students also learn the correct and ethical use of print and electronic sources. At least one research paper is required. A grade of C or higher is a graduation requirement. Note: Students passing a departmental diagnostic exam given on the first day of class will remain in EGL 101; all others will be placed in EGL 097. Prerequisite is any of the following: successful completion of EGL 097; an SAT essay score (taken prior to March 1, 2016) of 7 or higher; an SAT essay score (taken after March 1, 2016) of 5 or higher; on-campus placement testing. Credits: 3

**EGL 102 Composition II: Writing About Literature**
This is the second part of the required introductory English composition sequence. This course builds on writing skills developed in EGL 101, specifically the ability to write analytical and persuasive essays and to use research materials correctly and effectively. Students read selections from different literary genres (poetry, drama, and narrative fiction). Selections from the literature provide the basis for analytical and critical essays that explore the ways writers use works of the imagination to explore human experience. Grade of C or higher is a graduation requirement. Prerequisite(s): EGL 101 Credits: 3

**PSY 101 Introduction to Psychology (GE)**
This course is designed to present basic psychological concepts and to introduce students to the scientific study of behavior. Core topics include methods of psychological research, the biological bases of behavior, principles of learning, memory and cognition, personality, and psychopathology. Other selected topics to be covered would include the following: motivation and emotion, life-span development, social psychology, health psychology, sensation and perception, intelligence, human sexuality, statistics, and altered states of consciousness. Credits: 3

**BIO 130 Biological Principles I (GE)**
This course deals with biological processes primarily at the molecular and cellular level, and develops the foundations of evolutionary and ecological concepts. There is a study of cell structure, and an examination of cellular composition and metabolic processes including enzyme activity, respiration, and photosynthesis. Principles of genetics are studied at the cellular and molecular level, with reference to current techniques in molecular biology. Evolutionary mechanisms are introduced and ecological concepts are presented as a unifying theme. Note: BIO 130 is the first course in the required two-semester introductory sequence in the Bioscience Curriculum Core. It is also approved in the Natural Sciences General Education Competency Area and can serve as a lower-level laboratory science elective within the Liberal Arts. Note: the laboratory course, BIO 130L is a part of your grade for this course. Corequisite(s): BIO 130L Credits: 4
SOC 122 Introductory Sociology (GE)
This is an introductory course designed to familiarize students with the field of sociology. In addition to learning about the central concepts and major theoretical sociological perspectives, students study human behavior in groups, the organization of social life, the impact of social institutions on individuals, and the process of sociological research. Great emphasis is also placed upon development of students' sociological imagination? specifically, the ability to understand the ways that our individual lives are shaped by larger social forces and institutions. Note: Students who take SOC 122 may not receive credit for SOC 122W. Credits: 3

MTH 116 Algebra (GE)
This course is designed to provide students with a firm foundation in symbolic manipulation and algebraic reasoning. Both manipulative skills and conceptual understanding of algebraic principles are stressed. Topics include equivalent expressions and equations, linear functions, properties of exponents and logarithms, quadratic equations, power functions, exponential functions. Upon completion of this course students will be prepared for precalculus as well as for quantitative courses in the natural and social sciences. Prerequisite(s): MP2 or MTH 015 Credits: 4

BIO 131 Biological Principles II (GE)
This course deals with biological processes primarily at the organismal level, and examines the diversity of living things. The origins and adaptations of the Prokaryota, Protista, and Fungi are explored, with emphasis on their ecological roles, economic value, and medical significance. Plant life cycles are introduced, and plant structure, physiology, and utilization are studied. The evolution and adaptations of various animal phyla are presented, with a consideration of structure and function in each; organ systems are studied with emphasis on humans as representative vertebrates. Note: BIO 131 is the second course in the required two-semester introductory in the Bioscience Curriculum Core. It is also approved in the Natural Sciences General Education Competency Area and can serve as a lower-level laboratory science elective within the Liberal Arts. Note: the laboratory course, BIO 131L is a part of your grade for this course. Prerequisite(s): BIO 130 Corequisite(s): BIO 131L Credits: 4

BIO 170 Human Anatomy and Physiology I (GE)
This is the first semester of a two-semester sequence in which human anatomy and physiology are studied using a body systems approach, with emphasis on the interrelationships between form and function at the gross and microscopic levels of organization. This sequence is appropriate preparation for nursing and other allied health professions. Topics included in Anatomy and Physiology I are: basic anatomical and directional terminology, fundamental concepts and principles of cell biology, histology, and the integumentary, skeletal, muscular, and nervous systems. Students may not receive credit for both BIO 170 and BIO 270. Note: the laboratory course, BIO 170L is a part of your grade for this course. Prerequisite(s): High School biology with a lab or BIO 120 or 123 or 130; High School or College chemistry recommended Corequisite(s): BIO 170L Credits: 4

CHM 152 General Chemistry Principles I (GE)
The first part of a two semester sequence in General Chemistry Principles with laboratory. This course covers the qualitative and quantitative aspects of scientific measurement, the nature of matter, gases, liquids and solids, energy, atomic theory, properties of elements, chemical bonding, molecular structure and properties, stoichiometry, thermochemistry, and solutions. Note: the laboratory course CHM 152L is a part of your grade for this course. Attendance in the laboratory course is required. Approved eye-protection and a laboratory coat are required materials. A student must pass the laboratory course to receive a passing grade in the entire course. Prerequisite(s): (MP3, RMAT, RMTB, or MTH 116) and (Regents Chemistry or an equivalent High School Chemistry with Laboratory or CHM 124) Credits: 4

BUS 131 Marketing Principles
This course provides the student with a sound knowledge of the basic elements of the marketing process. Major topics include the features of consumer and organizational markets, market segmentation, and target market strategies. Product
planning and development, brands, packaging and other product features are covered. Price determination and the use of various pricing strategies are discussed. The factors in the selection of channels of distribution and the features of wholesaling and retailing are considered. Elements of the promotional process such as sales, advertising, and sales promotion are included. Ethical and legal issues in marketing, marketing of services, global marketing, and marketing on the Internet are also covered. Credits: 3

BIO 171 Human Anatomy and Physiology II (GE)
This is the second semester of a two-semester sequence in which human anatomy and physiology are studied using a body systems approach, with emphasis on the interrelationships between form and function at the gross and microscopic levels of organization. This sequence is appropriate preparation for nursing and other allied health professions. Topics include Anatomy and Physiology II are: the endocrine system, the cardiovascular system, the lymphatic system and immunity, the respiratory system, the digestive system, metabolism, the urinary system, fluid/electrolyte and acid/base balance; and the reproductive systems. Note: students may not receive credit for both BIO 171 and BIO 271. Note: the laboratory course, BIO 171L is a part of your grade for this course. Prerequisite(s): BIO 171 Corequisite(s): BIO 171L Credits: 4

CHM 153 General Chemistry Principles II (GE)
A continuation of General Chemistry Principles I, which includes laboratory. Topics include: solutions and their colligative properties, acids and bases, chemical equilibrium, ionic equilibrium, pH, buffers, titration curves, oxidation and reduction balancing, electrochemistry, chemical kinetics, the covalent bond and the shape of molecules. Note: the laboratory course CHM 153L is a part of your grade for this course. Attendance in the laboratory course is required. Approved eye-protection and a laboratory coat are required materials. A student must pass the laboratory course to receive a passing grade in the entire course. Prerequisite(s): CHM 152 Credits: 4

BIO 125/NTR 110 Introduction to Nutrition Science
This course provides a basic background in the nature and biochemical function of essential and non-essential nutrients, the molecular basis of metabolism and nutrient requirements of living cells and organisms. The role of nutrients in gene expression, genetically modified foods and the role of diet in the treatment of diseases. Credits: 3

CHM 260 Fundamentals of Organic Chemistry (GE)
A one semester course in organic chemistry designed to provide background in the fundamentals of nomenclature, mechanisms, structures, and synthesis of carbon based compounds. This course is designed for science and health science majors who desire a general rather than a detailed knowledge of the compounds of carbon. Topics to be covered include: structure and bonding, acid/base chemistry, isomerism, stereochemistry, and structure determination. Functional groups to be covered include: hydrocarbons, alcohols, ethers, aldehydes and ketones, carboxylic acids, carboxylic acid derivatives and amines. Laboratory work will include common organic techniques and experiments supporting the principles covered in lecture. Note: the laboratory course CHM 260L is a part of your grade for this course. Attendance in the laboratory course is required. Approved eye-protection and a laboratory coat are required materials. A student must pass the laboratory course to receive a passing grade in the entire course. Prerequisite(s): CHM 153 Credits: 4

BIO 220 Medical Microbiology w/Lab OR
The role of microbes as causative agents of disease in human hosts; the morphological characterization of pathogenic species, classification of communicable diseases and epidemiological aspects. Host-parasite relationship, infection, and host-resistance mechanisms; sero-diagnostic methods in medical practice. Chemotherapy, mode of action of antibiotics, sterilization, disinfection methods and contamination control. Note: the laboratory course, BIO 220L is a part of your grade for this course. Prerequisite(s): BIO 166 or 170 or 171 or 130 or 131 Corequisite(s): BIO 220L Credits: 4

NTR 330 Food Microbiology
This course is structured to give students an appreciation of the role of microorganisms in food processing, preservation and production. Topics covered relate various microorganisms to food spoilage and foodborne illness by genus and species. Microorganism differentiation in health promotion procedures is addressed at the local, state, and federal levels. Food microbiology unites the disciplines of microbiology and food technology. This course extrapolates industrial procedures, protocols and additives that aim to provide safer, longer lasting and affordable food for the world. Food microbiology covers classification and identification of microorganisms commonly associated with food and applies aspects of microorganism control to current common foodborne illness outbreaks in the United States. The laboratory course, NTR 360L, is a part of the grade for this course. Note: Students who have taken BIO 220 cannot receive credit for this course. Prerequisite(s): NTR 110 and Junior level status Corequisite(s): NTR 330L Credits: 3

NTR 200 Food Science w/Lab
Food Science integrates an interdisciplinary science approach to food and its components. Relationships between the chemical composition of food and sensory properties are delineated. In this course students evaluate the effects of processing, preparation, and storage on the quality, safety, and nutritive value of various food categories. Further, this course examines the application of technology to both improve and expand the food supply. Food science applies concepts from nutrition, health, biology, and chemistry to discriminate how the various ingredients in foods interact. Laboratory testing and food science techniques specific to the science of food are explored. The course, NTR 200L, is a part of the grade for this course. Prerequisite(s): NTR 110 or BIO 125 Corequisite(s): BIO 125L Credits: 4

NTR 300 Cultural Foods
This course is designed to examine the fundamental truths that govern human behavior around food choices and food selection. Students will look at the symbolic value and meaning of food, and will scrutinize the relationship of food cultures to consumer behavior. Students will explore the historical development of and current food cultures in Europe, Asia, Africa, the Middle East, and the Americas. Further, this course will explore the impact of food and food choices/preparation on nutritional status and health. Prerequisite(s): NTR 110 or BIO 125 Credits: 3

NTR 305 Weight Management & Obesity
This course will examine the genetic and social determinants of a person’s body weight and composition. Factors such as eating patterns, exercise amounts, and employment caloric expenditure will be explored. Lectures will separate fact from popular diet fiction. Students will examine weight loss and maintenance through evaluation and examination of current research data and compare and contrast fad diets and practices. Instruction is included on using epidemiology as a tool to understand and help prevent disease caused by excess weight in the United States population. Prerequisite(s): BIO 130 and Junior level status Credits: 3

NTR 310 Food Service Management
This course explores the organization and administration of food service systems. It covers the functions and responsibilities related to the management of menus, facility efficiency and state regulations. The course will cover leadership strategies related to food production, planning, site design, marketing, human resource management and cost accounting as they relate to equipment, food, and labor. Discussion includes food sanitation and safety, with emphasis on supervision skills. Prerequisite(s): (NTR 110 or BIO 125) and Junior level status Credits: 3

NTR 320 Medical Nutritional Therapy w/lab
This course explores current clinical nutrition practice in various disease states. Students develop knowledge and skill in dietary assessment and apply the appropriate medical nutrition therapies and dietary assessment methodologies while developing familiarity with medical terminology and practices. Students construct dietary intervention/modification protocols using food and dietary intake to meet dietary prescriptions and implement these protocols in diverse cultural groups. They use a biological science foundation to follow existing evidence-based guidelines and protocols to implement nutrition interventions and predict outcomes. Attention is placed on development of dietary practices to prevent and/or ameliorate
diseases such as food allergy, obesity, heart disease, and cancer. Prerequisite(s): (BIO 125 or NTR 110) and (BIO 170 and BIO 171) and Junior level status. Corequisite(s): NTR 320L Credits: 4

NTR 325 Nutrition Through the Life Cycle
This course explores nutrition needs throughout various stages of the life cycle including pregnancy and lactation, infancy, adolescence, and aging. People require similar nutrients throughout their life, however the amount and ratio of specific nutrients varies according to their age. Students will evaluate the relationship among nutrition, physical growth, activity, and disease on the human body. Socioeconomic and cultural influences will be addressed at each stage of life. Students will further explore psychological/behavioral influences on food and nutrition behavior throughout the life span. Prerequisite(s): BIO 170, BIO 171 and Junior level status Credits: 3

NTR 335 Nutritional Biochemistry
Nutritional biochemistry addresses the functional and structural characteristics of energy producing molecules (carbohydrates, lipids, proteins, and ethanol). The course evaluates the formulative molecular structures and nutrients involved in the major metabolic pathways of humans. Comparisons are made between normal metabolism and that found in various nutrient deficiencies. It teaches the chemistry of rate limiting steps and nitrogenous bases involved in transcription and translation at a cellular level. Prerequisite(s): CHM 260 and Junior level status Credits: 3

NTR 340 Nutrition Communication
This course takes previous nutrition knowledge and effectively develops skills to transfer that information to professional peers, clients, patients, employees, and the public. Efficient communication of complex and difficult nutrition and health information is practiced to improve interpersonal skills. Students will participate in verbal and written communication drills using techniques essential to communication for supporting positive behavior change. In this course students debate the development of methods for strong communication. Students compare and appreciate cultural differences in health/nutrition literacy. Prerequisite(s): EGL 101 and (NTR 110 or BIO 125) and Junior level status Credits: 3

NTR 350 Energy and Exercise
This course uses a biochemical approach to the catabolic reactions involved in human metabolic energy production. Emphasis is placed on human fuel usage, storage, and its use for energy transduction. Specific topics include the pathways by which nutrients are stored, and oxidized to provide ATP; hormonal regulation of energy balance and substrate utilization, the potential impact of physical activity, diet and physiological determinants (e.g. sex/gender, ethnicity/race) on human health, pathophysiology of obesity, insulin resistance, and other disorders related to energy metabolism, etc. Through lectures, discussion, and the reading of literature, students will critique the terms, concepts and methods in energy metabolism/exercise science. Students will learn critical thinking and evaluation skills on nutritional elements of energy production and usage. Prerequisite(s): (NTR110 or BIO125) and BIO 170, BIO 171 and Junior level status Credits: 3

NTR 405 Supplements & Ergogenic Aids
This course addresses caffeine and other herbal stimulants as a means to weight management and improved athletic performance. Americans currently spend billions of dollars a year on weight-loss supplements in pill form with limited government supervision because natural supplements are not considered drugs. Course work includes in-depth examination of the science behind the supplement industry and their promotions for health and well-being. This multifaceted industry is delineated from product purchasing, additives, purification, production, marketing, distributing and quality control. Holistic and integrative sales approaches are examined against empirical research findings. Past major ergogenic aid trends and fads are examined for effectiveness and safety. Prerequisite(s): NTR 320 Credits: 3

NTR 410 Macronutrient Metabolism
This course offers an in-depth examination of the biochemistry involved in human nutrition and metabolism. Macronutrient nutrition focus is on the role of biological energy production, fuel usage and storage. Additionally, protein?s role in immunity,
cell repair, and cell maintenance is examined at a molecular level. Emphasis is placed on the interrelationships of nutrients to catabolic and anabolic metabolism within biochemistry and human physiology. This is especially true for discussion metabolic states involving obesity and physical exercise. The course will reflect upon, examine and discuss current research related to nutrition and claims about alterations in metabolism. Prerequisite(s): NTR 335 Credits: 3

NTR 411 Micronutrient Metabolism
This is an advanced course in the biochemistry and physiology of micronutrients. Students are expected to be familiar with introductory nutrition material as well as biochemistry, and have a basic familiarity with physiology. This course covers fat soluble nutrients, water soluble nutrients, and minerals. Topics include nutrient digestion, absorption, transport, storage, and function in biochemical activity. This course will evaluate mineral and vitamin interactions and discuss health implications of varying amounts of vitamins and minerals in the diet. Prerequisite(s): NTR 335 and NTR 410 Credits: 3

NTR 420 Community Nutrition
This course provides students with the tools for developing community nutrition interventions. Students will learn about utilizing behavioral theory, conducting needs assessments, writing program objectives, developing intervention strategies, evaluating program implementation and effectiveness, planning a budget, and writing grant proposals. Students pick projects based on personal interest and work as individuals and in small groups. Further course topics include public health initiatives to increase fruit and vegetable intake, obesity prevention, school lunch nutrition, and availability of healthy foods to ?at risk? populations. Prerequisite(s): HPW 325 and Junior level status Credits: 3

NTR 425 Nutrition Science Seminar
This course provides students with the opportunity to gain experience in organization of material, dissemination of library/original research, and communication skills in nutrition and dietetic sciences. The course examines current issues and controversies in food, nutrition, and dietetics. Guest speakers will be scheduled to enrich student and faculty exposure to a variety of topics from their specific discipline, in their area of expertise. Prerequisite(s): NTR 335 and Junior level status Credits: 3

NTR 450 Research Methods in Nutrition Sciences
This course introduces the principles of research methodology as relevant to nutrition sciences. It examines the context of research in professional practice in the healthcare field, and will equip students with the basic research skills necessary for their continuing professional education. The course content considers concepts in both qualitative and quantitative research methodology, the critical appraisal of literature in science and healthcare, and includes basic statistical concepts and methods. Prerequisite(s): NTR 320 and Junior level status Credits: 3

Admission to Farmingdale State College - State University of New York is based on the qualifications of the applicant without regard to age, sex, marital or military status, race, color, creed, religion, national origin, disability or sexual orientation.