# Department of Agriculture, Nutrition, and Human Ecology

## Purpose and Goals

The Bachelor of Science in Agriculture program prepares graduates to function as entry-level professionals in various areas, including food, agriculture, natural resource marketing, production, distribution, and processing. The Bachelor of Science in Agriculture degree program offers a generalist emphasis that serves as the foundation for diverse careers and a springboard for advanced study in agriculture, natural resource sciences, and related fields. Concentrations are available in Agribusiness, Plant and Soil Sciences, Natural Resources and Environmental Sciences, and Animal and Food Sciences. These concentrations guide students in defining an area for future specialization they can attain at the graduate level and through professional practice. The emphasis on Animal and Food Sciences may serve as pre-professional curricula for veterinary medicine. In consultation with their advisors, students should select additional courses to qualify for professional veterinary medicine research.

Students enrolled in agriculture are afforded hands-on experience through laboratory, field exercises, cooperative education, and summer job assignments. Students completing the program can demonstrate varied skills in many areas. Faculty provide guidance and support to foster students' personal development and leadership skills essential for effective professional practice in the chosen field of practice.

The Human Nutrition and Food program provides quality nutrition education to students who want to pursue a dietetics career. The curriculum provides an avenue toward students' eligibility to become registered dietitians.

The Human Nutrition and Food program is accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND), 120 South Riverside Plaza, Suite 2000, Chicago, Illinois 60606-6695; Telephone: 800-877-1600 ext. 5400. Website http://www.eatright.org (http://www.eatright.org/).

The College of Agriculture, Food, and Natural Resources shall serve to reinforce and strengthen the land grant mission of the University by implementing programs in the agricultural, food, nutrition, and natural resource sciences that 1) highlight learning, discovery, and engagement; 2) focus on matters related to the interactive roles of individuals, and communities within social, economic, environmental, and global systems; and 3) anchor these actions on sound public policy, the best available science, and efficient management.

Specifically, the programs in the college shall provide:

1. Instructional activities in Agriculture and Dietetics programs provide learning opportunities that prepare students to respond effectively to complex social issues relating to the food, agricultural, and natural resource sciences through innovative strategies in the delivery of classroom, laboratory, and experiential learning activities. The programs prepare graduates for discovery and engagement in a diverse global labor force and for advanced graduate and professional school studies. These activities are conducted within the Department of Agriculture, Nutrition, and Human Ecology structure.

2. Research activities to conduct basic and applied research in the agricultural, food, and natural resource sciences that generate scientific information and technological developments that respond to the needs of stakeholders. These activities are conducted primarily within the structure of the Cooperative Agricultural Research Center.

3. Extension activities to deliver research-based information and informal educational opportunities focused on identified issues and needs of Texans of diverse ethnic and socioeconomic backgrounds, emphasizing historically unserved and underserved individuals. These activities are conducted primarily within the structure of the Cooperative Extension Program.

4. International activities that establish sustainable linkages and collaborative relationships of mutual interest with global partners and sponsors to develop human capital and natural and institutional resources through the implementation of the land grant mission functions of teaching/learning, research/discovery, and service/engagement in the agricultural, food, and natural resource sciences. These activities are conducted primarily within the structure of study abroad and research opportunities.

The graduate program emphasizes the preparation of students for teaching, research, and public service in colleges and universities, in social and public service agencies, and managerial positions in business, industry, or government. The curriculum offers opportunities for students to tailor the program to meet individual needs and prepares graduates to work with clientele professionally as agents of change. The program's specific goals provide opportunities for enhanced professional competency development and the development of an academic and stylistic model for additional graduate study in various academic specialties.

## Pre-Veterinarian Minor Requirements

Students pursuing a Bachelor of Science in Agriculture with a concentration in Animal and Food Sciences may choose to pursue the Pre-Veterinarian minor to meet additional requirements for Veterinary Medicine school.

| | | |
|---|---|---|
| BIOL 1308 | Biology for Non-Science Major I | 3 |
| BIOL 1502 | General Biology | 5 |
| BIOL 3404 | Immunology | 4 |
| BIOL 4201 | Medical Terminology | 2 |
| CHEM 2203 | Organic Chemistry Lab I | 2 |
| CHEM 2204 | Organic Chemistry Lab II | 2 |
| CHEM 4204 | Biochemistry Laboratory | 2 |
| MATH 1342 | Elementary Statistics | 3 |
| **Total Hours** | | **23** |

## Graduate Certificate in Dietetics Requirements

The Graduate Certificate in Dietetics is offered for individuals accepted for matriculation in the Dietetic Internship. The following courses are required as components of the certificate program:

| | | |
|---|---|---|
| HUSC 5632 | Advanced Practice in Dietetics I | 6 |
| HUSC 5635 | Advanced Practice in Dietetics II | 6 |
| HUSC 5335 | Dietetic Seminar I | 3 |
| HUSC 5331 | Dietetic Seminar II | 3 |

The Dietetic Internship Program at Prairie View A&M University is accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND), 120 South Riverside Plaza, Suite 2000, Chicago, Illinois 60606-6695; Telephone 800-877-1600 ext. 5400. Website http://www.eatright.org.

## Agricultural Economics Courses

***AGEC 3321 Agricultural Policy: 3 semester hours.***
Study of the development of agricultural and food policies and evaluation of policies impact on producers and consumers in domestic and international markets.
Prerequisites: (AGRI 2321 or AGEC 2213) and (AGEC 3322 (may be taken concurrently) or AGEC 3223 (may be taken concurrently)).

***AGEC 3322 Agricultural Financial Analysis: 3 semester hours.***
Introduction to principles and concepts of finance. Financial statement analysis, risk and returns, time value of money, valuation concepts, capital budgeting, investments, and cost of capital.
Prerequisites: (AGEC 3321 (may be taken concurrently) or AGEC 3213 (may be taken concurrently)) and (MATH 1113 or MATH 1314).

***AGEC 3325 International Trade and Logistics: 3 semester hours.***
Development of basic competencies in international marketing of food and agricultural products. Focus will be on major markets, international competition, and the impacts of US trade policies and exchange rates on trade.
Prerequisites: (AGRI 2317 or AGEC 1233 or ECON 2113 or ECON 2302) and (MATH 1113 or MATH 1314).

***AGEC 3399 Independent Study: 1-3 semester hour.***
Reading, research and/or field work on selected topics.

***AGEC 3699 Independent Study: 1-6 semester hour.***
Reading, research and/or field work on selected topics.

***AGEC 4322 Agribusiness Management: 3 semester hours.***
Economic and business principles applied to the organization and operation of farms and ranches, and other agri-business industries.
Prerequisites: (AGRI 2317 or AGEC 1233 or ECON 2113 or ECON 2302) and (MATH 1113 or MATH 1314).

***AGEC 4323 Land and Resource Economics: 3 semester hours.***
Analysis of the economic, political, and institutional forces involved in the control and use of land and natural resources. Emphasis on land as a factor of production in agriculture.
Prerequisites: ((AGEC 2317 or AGEC 1233) or (ECON 2113 or ECON 2302)) and (MATH 1113 or MATH 1314).

***AGEC 4325 Agricultural Prices: 3 semester hours.***
Theories and principles fundamental to the pricing of agriculture commodities. Special emphasis will be placed on marketing conditions affecting price levels. Price and income parity, seasonal and cyclical price variations and futures trading. Prerequisites: senior classification or approval of instructor.
Prerequisites: ((AGEC 1233 or AGRI 2317) or (ECON 2113 or ECON 2302)) and (MATH 1113 or MATH 1314).

***AGEC 4399 Independent Study: 1-3 semester hour.***
Readings, research and/or field work on selected topics.

***AGEC 4699 Independent Study: 1-6 semester hour.***
Reading, research and/or field work on selected topics.

***AGEC 5321 Land Use and Resource Management: 3 semester hours.***
Nature and the economic dimensions of private and public control of land. Use of natural resources, including land, stock and flow resource concepts; time and space as they affect resource utilization and benefits. Laboratory studies of field problems in resource management and use.

## Agricultural Engineering Courses

***AGEG 4342 Farm Drainage: 3 semester hours.***
Land drainage: terracing, gully control, irrigation, and land reclamation.

## Ag and Human Resources Courses

***AGHR 3379 Cooperative Occupational Experience in Agriculture: 3 semester hours.***
Pre-baccalaureate work experience in the food and agriculture sciences commensurate with the student's academic emphasis. Written report of activities consistent with program guidelines upon completion of experience. A minimum of 100 clock hours of supervised work activities is required.

***AGHR 3699 Cooperative Occupational Experience in Agriculture: 6 semester hours.***
Pre-baccalaureate work experience in the food and agricultural sciences commensurate with the student's academic emphasis. Written report of activities consistent with program guidelines upon completion of experience. A minimum of 200 clock hours of supervised work activities are required.

***AGHR 4341 Special Topics: 3 semester hours.***
Study of a problem affecting some aspect of the food and agricultural science industry. Reports, discussion and major paper required. Repeatable for up to 6 semester credit hours.

***AGHR 4399 Independent Study: 3 semester hours.***
Readings, research and/or field work on selected topics. Prerequisite: Advisor consent.

## Agriculture Courses

***AGRI 1301 Natural Resource Conservation Management: 3 semester hours.***
Ecological approach to basic conservation principles, concepts and techniques underlying the management and uses of natural resources that is both efficient and sustainable.
Prerequisites: (AGRI 1370 or AGRO 1703) and (AGRO 2633 or AGRI 2363).

***AGRI 1311 Dairy Science: 3 semester hours.***
Branches of the dairy industry, introduction to dairy types and breeds, the major factors in the management of cattle for milk production, and the common dairy processes.
Prerequisites: AGRI 1319 or ANSC 1513.

***AGRI 1319 General Animal Science: 3 semester hours.***
Introductory course dealing with domestic farm animals common in the United States. Selection, reproduction, nutrition, management and marketing of beef cattle, swine, sheep, goats, and horses.

***AGRI 1327 Poultry Science: 3 semester hours.***
Knowledge of the history and development of the poultry industry; the anatomy and physiology of the domestic fowl, especially related to reproduction. Inferences of genetic, environmental and behavioral factors on embryonic development; effects of diet, drugs and toxins. Practices involve artificial incubation, breeding and rearing.
Prerequisites: (AGRI 1319 or ANSC 1513) and (AGRI 2351 (may be taken concurrently) or ANSC 2513) and (AGRI 1311 (may be taken concurrently) or ANSC 2533).

***AGRI 1330 Land Grant System and Global Food Security: 3 semester hours.***
This course is designed to educate students about the land grant mission, created by the Morrill Act passed by Congress in 1862 and 1890. Areas related to science technology in Global Food Security and Sustainable Food program will be emphasized. Students will actively participate in peer workshops to demonstrate critical thinking skills gained through programs.

***AGRI 1331 Agricultural Science and Technology: 3 semester hours.***
Introduction to professions in agricultural sciences and technology. Importance of agriculture in the state, nation and world. Review of research developments; explorations of career and other opportunities and development of human resource skills needed in agriculture.

***AGRI 1341 Fundamentals of Agricultural Engineering: 3 semester hours.***
Introduction to the major areas of agricultural engineering with emphasis on solving practical problems in agricultural production systems, grain systems, food systems, and hydrology. Course includes hands on work.

***AGRI 1370 Crop Science: 3 semester hours.***
Botanical characteristics of agronomic and horticultural plants; relationship between crops and civilization in both historical and biological terms; nature of crop plants in relation to structure, physiology, environment, growth and development; crop improvement, cropping systems and practices, crop hazards and prevention.

***AGRI 2317 Fundamentals of Agricultural Economics: 3 semester hours.***
Survey of the nature, organization, and operation of the agricultural industry: application of economic principles to production and to the marketing of farm-ranch food and fiber products: and investigation of institutions and government as they affect agriculture.

***AGRI 2321 Marketing Agricultural Products: 3 semester hours.***
Study of movement of food and fiber products from the production area to the final consumer. Focus on intermediaries, including transportation agents. Efficiency of performing marketing activities under conditions for perfect and imperfect markets will be emphasized.
Prerequisites: (AGRI 2317 or AGEC 1233) and (AGRI 2322 (may be taken concurrently) or AGEC 2223 (may be taken concurrently)).

***AGRI 2322 Food Distribution Systems: 3 semester hours.***
Study of the nature and functions of the various components of wholesale and retail food distribution. Facility locations, transportation, warehousing, quality control, inventory control, pricing, and other related topics.
Prerequisites: (AGEC 1233 or AGRI 2317) and (AGEC 2213 or AGRI 2321).

***AGRI 2342 Agricultural Machinery: 3 semester hours.***
Identification of agricultural machines and equipment; accessories, attachments, and components of agricultural tractors; inspections, adjustments, and maintenance services; and career opportunities.

***AGRI 2351 Animal Production and Marketing: 3 semester hours.***
Systematic study of methods of breeding, feeding, marketing, sanitation and management of commercial animals (swine, beef and dairy cattle, horses, goats and sheep).
Prerequisites: (AGRI 1319 or ANSC 1513) and (AGRI 1327 (may be taken concurrently) or ANSC 2523) and (AGRI 1311 (may be taken concurrently) or ANSC 2533).

***AGRI 2354 Diseases and Sanitation: 3 semester hours.***
Clinical studies of the most common livestock diseases embracing anamnesis, etiology, symptoms, diagnosis, therapeutics, and prophylaxis.
Prerequisites: (AGRI 1319 or ANSC 1513) and (AGRI 2351 (may be taken concurrently) or ANSC 2513) and (AGRI 1311 (may be taken concurrently) or ANSC 2533).

***AGRI 2360 Environmental Soil Science: 3 semester hours.***
An introduction to soils, its components and its relationship the environment. The importance of soils to man, animals and plants. Import physical properties, role of soil constituents; origin, nature, and classification of parent materials; soil genesis, classification and survey; soil fertility and chemical properties; soils and chemical pollution; soils and the world's food supplements.

***AGRI 2363 Forage and Pasture Management: 3 semester hours.***
Use of forage in grassland agriculture, identification of forage grasses and legumes, cultural practices including weed control, mechanization of forage harvesting and storage; types of pastures, different systems of grazing management and utilization of forages by farm animals.
Prerequisites: AGRI 1370 or AGRO 1703.

***AGRI 2373 Principles of Crop Production: 3 semester hours.***
Crop characteristics and classifications, growth patterns, soil and climate requirements (Physiology), pest control, storage, distribution, and application of these principles to the management and production of field and vegetable crops for improved food, fiber, and forages.
Prerequisites: AGRI 1370 or AGRO 1703.

***AGRI 3699 Independent Study: 1-6 semester hour.***
Readings, research and/or field work on selected topics.

***AGRI 4699 Independent Study: 1-6 semester hour.***
Readings, research and/or field work on selected topics.

## Agronomy Courses

***AGRO 3362 Soil Morphology and Classification: 3 semester hours.***
The shape and source of soil features materials and processes involved in or produced after the formation of soil with emphasis on variations world-wide and the principles of soil classification, mapping, and interpretation. Additional topics include: soil taxonomy; land capability classification; soil survey and its utilization; and soil interpretations for non-farm uses.
Prerequisites: (AGRO 2603 or AGRO 2360) and (AGRO 3633 (may be taken concurrently) or AGRO 3363 (may be taken concurrently)) and (AGRO 3371 (may be taken concurrently) or AGRO 3713 (may be taken concurrently)).

***AGRO 3363 Soil Fertility and Fertilizers: 3 semester hours.***
Chemical, biological and physical processes as they influence soil fertility, manufacture of fertilizers and their reactions with soils and the oil-plant-water system.
Prerequisites: (AGRO 2603 or AGRO 2360) and (AGRO 3623 (may be taken concurrently) or AGRO 3362 (may be taken concurrently)) and (AGRO 3713 (may be taken concurrently) or AGRO 3371 (may be taken concurrently)).

***AGRO 3364 Soil and Water Management: 3 semester hours.***
Sustainable soil productivity and management in agricultural systems involving resource inputs, tillage systems, erosion control, residue management, and water management for a quality environment.
Prerequisites: (AGRI 2360 or AGRO 2603) and (AGRO 3373 (may be taken concurrently) or AGRO 3733).

***AGRO 3371 Gen Entomology: 3 semester hours.***
Insect morphology, life histories, characteristics and habits of beneficial and harmful insects and their impact on agricultural production and the environment; anatomy and physiological growth and metamorphosis, insect orders, ecological aspects and insect behavior, control of harmful insects.
Prerequisites: AGRO 1703 or AGRI 1370.

***AGRO 3373 Plant Pathology: 3 semester hours.***
Fundamental principles of plant pathology, including parasites and disease development, identification of major agronomic diseases and their biotic and abiotic causes; proper diagnosis of plant diseases, differentiation between signs and symptoms, isolation of pathogens in pure culture; environmental effects on development of infectious plant diseases; control of plant diseases.
Prerequisites: AGRI 1370 or AGRO 1703.

***AGRO 3399 Independent Study: 1-3 semester hour.***
Readings, research and/or field work on selected topics.

***AGRO 3699 Independent Study: 1-6 semester hour.***
Readings, research and/or field work on selected topics.

***AGRO 4361 Soil Microbiology: 3 semester hours.***
Role of soil microorganisms in soil-plant ecosystems. Microbial ecology, microbes in nutrient cycles important to agriculture, pesticide degradation, bacterial fertilizers, composting, waste disposal, plant microbe interactions. Laboratory estimation of soil microbial populations and measurement of important biological processes in soil and current methods.
Prerequisites: (AGRO 3362 or AGRO 3623) and (AGRO 3363 or AGRO 3633) and (AGRO 3364 or AGRO 3643).

***AGRO 4362 Environmental Science: 3 semester hours.***
Physical, chemical, biological and agricultural components of the environment and their interactions and effects on pollution and the maintenance and utilization of varied environmental systems.
Prerequisites: AGRO 2360 or AGRO 2603 and (AGRI 1301 or AGRO 2613).

***AGRO 4399 Independent Study: 1-3 semester hour.***
Readings, research and/or field work on selected topics.

***AGRO 4699 Independent Study: 1-6 semester hour.***
Readings, research and/or field work on selected topics.

***AGRO 5366 Principles of Environmental Science and Management: 3 semester hours.***
Discussion, study and analysis of the methods of monitoring, assessing, and designing remedies for environmental pollution, including the physical, chemical and biological components utilized in maintaining and improving the capacity of varied environmental characteristics as related to agricultural production.

***AGRO 5375 Soils, Ecology, and Land Uses: 3 semester hours.***
Soils and their properties as planned related to landscape ecology and specific land uses will be examined on a global, regional, and local level. An ecosystem approach will be used to examine issues and current problems associated with ecology and land use practices in agricultural systems, rangelands, forests, and wetlands. Also, ethical and philosophical points will be considered based on different soils, ecology, and land use viewpoints.

***AGRO 5379 Problems and Issues in Environmental Science: 3 semester hours.***
Identification and analysis of current trends and issues in environmental science. Evaluation of pending legislation, federal agency regulations and state and local policy applications. Reports; discussions; projects.

## Animal Science Courses

***ANSC 2255 Poultry Tech & Marketing: 2 semester hours.***
Factors affecting the physical, chemical, microbiological and functional characteristics of poultry and egg products. Product development, processing, quality packaging, and quality control concepts.
Prerequisites: ANSC 1513 or AGRI 1319.

***ANSC 3350 Animal Nutrition: 3 semester hours.***
Composition and digestibility of feed, with physiology, preparation, feeding standards, calculation and balancing rations for commercial animal (swine, cattle-beef and dairy, sheep, goats, and horses).
Prerequisites: ANSC 1513 or AGRI 1319.

***ANSC 3351 Anatomy and Physiology: 3 semester hours.***
Comparative approach, anatomically and physiologically of the basic systems of the domestic animals.

***ANSC 3352 Meat Science: 3 semester hours.***
Methods of slaughtering farm animals, processing, curing preservation and storage of meats and products.
Prerequisites: ANSC 1513 or AGRI 1319.

***ANSC 3399 Independent Study: 3 semester hours.***
Readings, research and/or field work on selected topics.

***ANSC 3451 Anatomy and Physiology: 4 semester hours.***
Comparative approach, anatomically and physiologically of the basic systems of domestic animals.
Prerequisites: AGRI 1319 or ANSC 1513.

***ANSC 3699 Independent Study: 1-6 semester hour.***
Readings, research and/or field work on selected topics.

***ANSC 4353 Breeding/Genetics: 3 semester hours.***
Physiology of reproduction, breeding, breeding systems and practices. Application of genetic principles to the problems of animal breeding. Prerequisite: Junior standing.
Prerequisites: (ANSC 1513 or AGRI 1319) and (ANSC 2513 or AGRI 2351).

***ANSC 4399 Independent Study: 3 semester hours.***
Readings, research and/or field work on selected topics.

***ANSC 4499 Independent Study: 1-4 semester hour.***
Readings, Research and/or field work on selected topics.

***ANSC 4699 Independent Study: 1-6 semester hour.***
Readings, research and/or field work on selected topics.

## Food Science Courses

***FDSC 3358 Food Quality Assurance and Sanitation: 3 semester hours.***
Examination of the elements of a comprehensive quality assurance program. Areas of study include sanitation, pest control, waste disposal, food law regulations, sensory testing, panel selection and training, and experimental design and analysis of data.

***FDSC 3359 Food Bacteriology: 3 semester hours.***
Microbiology of human foods and accessory substances. Raw and processed foods, physical, chemical and biological phases of spoilage. Standard industry techniques of inspection and control.

***FDSC 3699 Independent Study: 1-6 semester hour.***
Reading, research, and/or field work on selected topics.

***FDSC 4357 Food Processing and Engineering: 3 semester hours.***
Study of the principles and practices of thermal processing, quick freezing, dehydration, fluid flows, heat transfer, pickling and juice manufacture.

***FDSC 4699 Independent Study: 1-6 semester hour.***
Reading, research, and/or field work on selected topics.

## Human Development Family Courses

***HDFM 2351 Childhood Disorders: 3 semester hours.***
This course is designed to introduce a general overview and treatment of major childhood disorders. It examines the history of childhood psychopathology, theories of development, medical and biological factors, mental retardation, drug and alcohol use, social and environment factors that relate to childhood problems.

***HDFM 2353 The Contemporary Family in Cross-Cultural Perspective: 3 semester hours.***
Analysis of family interaction patterns, roles, and functions, throughout the life cycle as influenced by customs, cultural diversity, and socioeconomic status with implications for broader understanding of a multicultural society. Examination of public policies and procedures impacting family functioning.

***HDFM 2355 Human Development: Life Span: 3 semester hours.***
The dynamic processes of co-development of the individual from conception to senescence in physical, sensory, intellectual, emotional, and social development, Pattern of self-development with focus on the interaction between and among individuals.

***HDFM 3350 Early Childhood Environments: 3 semester hours.***
Study and analysis of varied environments for children. Guidelines for program planning, identification and selection of creative and expressive materials and equipment, staffing, organization and management, record keeping, licensing requirements, parent/child/teacher interactions, and effective guidance techniques. Observation, participation and assessment required.

***HDFM 3351 Individual and Family Counseling Strategies: 3 semester hours.***
Study, assessment and application of basic interviewing and counseling strategies to include varied interviewing models, techniques and methods which facilitate individual and family interactions.

***HDFM 3352 Parenting Issues and Education: 3 semester hours.***
Principles and patterns, philosophies and theories, methodologies and practices, and resources for the design, implementation, and evaluation of programs for enhancing parenting skills in the parent-child relationship.

## Human Nutrition Food Courses

***HUNF 1130 Introduction to Dietetics: 1 semester hour.***
Students will be introduced to the profession of dietetics. The history of dietetics, career options, professional development (dietetics portfolio), the Academy code of ethics, standards of practice, the legislative process, and professional resources will be discussed.

***HUNF 1322 Nutrition and Wellness: 3 semester hours.***
Introduction to human nutrition and food. Study of human nutritional needs and problems encountered in providing food for the satisfaction of physiological and socio-cultural system needs, and the significance of these interrelationships to health. Discussion of current nutritional issues.

***HUNF 2353 Intermediate Nutrition: 3 semester hours.***
Introductory study of the principles of nutrition and the application of these principles to providing adequate nutrition to humans. Introduction to the biochemical and physiological approach to nutrition will be emphasized.
Prerequisites: HUSC 1322 or HUSC 1343.

***HUNF 2363 Food Service Systems: 3 semester hours.***
Study of the layout and design, equipment selection, and specifications of Food Service organizations, with emphasis on safety, sanitation, labor and financial control and consumer distribution.

***HUNF 2365 Food Principles and Meal Management: 3 semester hours.***
Principles of preparation, organization, and management applied to planning, preparation, serving, and marketing nutritious meals to individuals and groups at varied socioeconomic levels. Management of work areas, organization techniques, and standards for meal service and table appointments.
Prerequisites: HUSC 1322 or HUSC 1343.

***HUNF 2366 Food Systems Management: 3 semester hours.***
Management principles, process and control strategies, roles and responsibilities in food service systems. Application of food preparation and management principles to quantity food production including menu planning, procurement, storage and distribution.

***HUNF 3360 Nutritional Biochemistry: 3 semester hours.***
A study of the biochemical basis of nutrition, the physiochemical properties of nutrients, and other essential biochemical and their roles in physiological and metabolic processes.
Prerequisites: HUNF 2533.

***HUNF 3361 Nutrition Throughout the Lifecycle: 3 semester hours.***
Comparative assessment evaluation of nutrition and dietary requirements throughout the lifecycle. Pre-pregnancy, pregnancy, lactation, infancy, childhood, adolescence. adulthood, and aging. Nutritional needs on the basis of both physical growth and psychological development are emphasized.
Prerequisites: HUSC 1322 or HUSC 1343.

***HUNF 3362 Food Science and Technology: 3 semester hours.***
Principles and techniques of food processing and preservation and their effects on nutrient retention. Food and drug regulations, food additives and standards of identity.
Prerequisites: (CHEM 2303 or CHEM 2033) and (CHEM 2203 or CHEM 2032) and (HUNF 2365 or HUNF 2653).

***HUNF 3363 Advanced Nutrition: 3 semester hours.***
A review of the fundamentals of human nutrition. Course provides a comprehensive study of the structure and functions of carbohydrates, fats, proteins, vitamins and minerals in metabolism, and how these nutrients are used in the prevention of diseases.
Prerequisites: HUNF 2353 or HUNF 2533.

***HUNF 3364 Food and Culture: 3 semester hours.***
Food and Culture explores the connections between what we eat and who we are through a cross-cultural study of how personal and social identities are formed via food production, preparation, and consumption.
Prerequisites: HUNF 1301 or HUNF 1130.

***HUNF 3365 Nutrition and Disease: 3 semester hours.***
Study of the physiological and metabolic anomalies in chronic and acute diseases, and principles of nutritional therapy and prevention. Computer assisted nutritional assessment and diet calculations.
Prerequisites: HUNF 2353 or HUNF 2533.

***HUNF 3367 Nutritional Assessment: 3 semester hours.***
The course provides an in-depth to the purpose, concepts, methods, and scientific basis for assessment of nutritional status for individuals and groups. Students will have the opportunity to apply nutritional assessment principles and methods discussed in class in a supervised setting.
Prerequisites: HUNF 2533 and MATH 1113.

***HUNF 3399 Independent Study: 3 semester hours.***
Readings, research and/or field work on selected topics.

***HUNF 3699 Independent Study: 1-6 semester hour.***
Readings, research and/or field work on selected topics.

***HUNF 4330 Human Nutrition and Food Practicum: 3 semester hours.***
Planned observation and entry-level work experience in selected clinical, hospital, business, industrial, educational or governmental settings in Nutrition, Food Science, Foods, Dietetics or Nutrition Research. Required field experience includes a minimum of 200 clock hours of supervised work activities.

***HUNF 4347 Nutrition Counseling: 3 semester hours.***
This course is a directed study in theories, behavior change models, nutrition counseling, ADA Scope of Dietetics Practice Framework, the Standards of Professional Performance, the Code of Ethics of Dietetics, interdisciplinary relationships, and current issues in Human Nutrition.
Prerequisites: (HUNF 3365 or HUNF 3653) and (HUNF 4366 or HUNF 4663).

***HUNF 4360 Physiochemical Aspects of Food: 3 semester hours.***
This course covers physical and chemical factors accounting for color, flavor, and texture of natural and processed foods. Laboratory experiments to illustrate the effects of varying ingredients and treatment on the quality of food products. Objective and Sensory testing to determine food quality characteristics will be conducted.
Prerequisites: HUNF 3362 or HUNF 3623.

***HUNF 4361 Research in Nutrition: 3 semester hours.***
Investigate special topics in nutrition. Research methodology and computer application including statistical analysis. Proposals prepared by students and presented to instructor for approval. Students work independently, seeking guidance as necessary.
Prerequisites: MATH 1342 or MATH 2003.

***HUNF 4366 Medical Nutrition Therapy I: 3 semester hours.***
Focus will be on Nutrition Care Process in Nutritional Screening Assessment, and Diagnosis of Metabolic, Cardiovascular and infectious disease states. Emphasis will be on medical terminology, clinical, anthropometric and nutritional data analysis, documentation, and provision of care.
Prerequisites: (HUNF 3361 or HUNF 3613) and (HUNF 3365 or HUNF 3653).

***HUNF 4367 Medical Nutrition Therapy II: 3 semester hours.***
Focus will be on Nutrition Care Process (NCP) in the treatment of metabolic, cardiovascular and infectious disease states.
Prerequisites: HUNF 4366 or HUNF 4663.

***HUNF 4369 Community Nutrition and Health: 3 semester hours.***
Study of human nutrition and health problems from a community perspective; programs and policies related to nutrition at local, state and federal levels; approaches and techniques of effective application and dissemination of nutrition knowledge in communities.
Prerequisites: (HUSC 1322 or HUSC 1343) and (HUNF 3361 or HUNF 3613).

***HUNF 4399 Independent Study: 3 semester hours.***
Readings, research and/or field work on selected topics.

***HUNF 4699 Independent Study: 1-6 semester hour.***
Readings, research and/or field work on selected topics.

## Natural Resources and Environmental Sciences Courses

***NRES 5101 Seminar: 1 semester hour.***
Two presentations to be made during the semester; the first presentation will be at the beginning of the semester stating the proposal for master's thesis/ internship and second will be at the end of the semester to state accomplishment.

***NRES 5202 Advanced Research Methods in NRES: 2 semester hours.***
Literature review, understand the research methods, learn to write proposals, data collection (including in-situ), data analysis and methods, presenting results, learn to present (oral and poster) through a project work, writing report.

***NRES 5303 Research Statistics in NRES: 3 semester hours.***
Analysis of variance, regression, multivariate analysis, multivariate data, visualization, principal components analysis, multidimensional scaling, factor analysis, cluster analysis, confirmatory factor analysis and structural equation models by statistical computer packages.
Prerequisites: MGMT 3301 or MGMT 3013.

***NRES 5305 Advanced GIS and RS for Environmental Management: 3 semester hours.***
Advanced GIS and RS components for natural resources and environmental management such as landscape and water resources management. It covers to create, store, manage, query, present and view spatial and non-spatial natural resources and environmental datasets. It includes how accurately and precisely natural resources can be mapped and measured from satellite remote sensing using remote sensing GIS and RS tools. It also includes collecting satellite image, spatial data, to learn its application in industries such as emergency response, meteorology, water resources, land use, agriculture, forest, and urban planning.
Prerequisites: GEOG 2311 or GEOG 2113.

***NRES 5310 Economic Analysis of Natural Resource Management: 3 semester hours.***
This course focuses on developing an understanding of an economic framework (economic concepts, tools, and techniques) for assessing natural resource management projects, application of the framework to the management of various natural resources.

***NRES 5311 Human Dimensions of Natural Resource Management: 3 semester hours.***
Human - environment interactions; environmental justice; human values, beliefs, and attitudes regarding the environment; communication and behavior change strategies; landscape perception and attitudes; resource-dependent communities; public involvement; conflict management; and future issues.

***NRES 5312 Resources and Environmental Policy: 3 semester hours.***
This course focuses on exploration of institutional and policy dimensions of natural resource development, management, allocation, markets and pricing, focusing on their environmental impacts. Emphasis on policy analysis using case studies and empirical findings.

***NRES 5322 Environmental Hydrology: 3 semester hours.***
Hydrologic cycle, water resources, and society; hydrologic processes; hydrological effects of climatic change; stream processes; open channel flow, hydraulic control structures; soil conservation and sediment budgets; hydrology of forests and wetlands; hydrogeology; human impacts on water resources; fundamentals of remote sensing and GIS for hydrologic application; practical exercises on conducting and reporting hydrologic studies.
Prerequisites: AGRO 4362.

***NRES 5323 Hydrologic Processes in Soils: 3 semester hours.***
An overview of the basics of soil physical properties, hydrologic processes in soil including water flow, solute movement, and gaseous transport in the variably saturated (saturated/unsaturated) zones, analyze and estimate soil hydraulic properties using public domain packages (RETC and Rosetta), practical and theoretical exercises using HYDRUS-1D.
Prerequisites: AGRO 3364.

***NRES 5324 Advanced Watershed Management: 3 semester hours.***
Hydrologic cycle, watershed characteristics, precipitation and interception, evapotranspiration, soil water storage, infiltration, runoff process, soil properties, hydrologic methods, wetlands hydrology and management, riparian area management, erosion, tropical watershed management, socioeconomic considerations in watershed management, water quality, and watershed planning and protection. Hand on experience in data handling, presentation, and analysis. Gain experience in critiquing research work and publications.
Prerequisites: NRES 5323.

***NRES 5325 Advanced Groundwater Hydrology: 3 semester hours.***
Overview of groundwater flow and analytical water flow solutions; theory and practice of groundwater modeling; basic concepts and governing equations of fluid flow in porous media; computational algorithms of solving the equations; model construction, simulation, and calibration using state-of-the-art modeling tools; theory of solute transport and modeling; modeling report, archive, and review; beyond basic modeling concepts.
Prerequisites: NRES 5323.

***NRES 6600 Thesis: 6 semester hours.***
Independent research work on a specific area in Natural Resources Environmental Sciences under the supervision of a thesis advisor. All course work toward the degree must be completed.
Prerequisites: NRES 5324 and NRES 5325.

## Nutrition Courses

***NUTR 5100 Seminar in Nutrition: 1 semester hour.***
This course will place a major emphasis on the current development in nutrition and dietetics. Reading, discussion, reports, case studies and presentations focusing on the professional practice of nutrition and dietetics. Critical thinking activities related to research seminars in human nutrition.

***NUTR 5300 Research Methods: 3 semester hours.***
This course will teach students how to develop, implement and analyze nutrition and public health research, in order to increase their skills as dietitians/nutritionists, and public health scientists.
Prerequisites: MATH 2003 or MATH 1342 or HUNF 4613 or HUNF 4361.

***NUTR 5301 Food and Nutrition Policy: 3 semester hours.***
This class will investigate and discuss the roles and interests of federal agencies, state agencies, private/public organizations, and the media relevant to U.S. food and nutrition policy. A comparison and contrast of international perspectives on food and nutrition policies and programs used to support global nutrition and health promotion will be examined. Topics covered will include discussions on healthy diet, healthy food environments, food security, sustainable food systems, and food deserts. Emphasis will be given to the contexts in which policies are developed, interaction of stakeholders, translation of policies into programs, the intended and unintended nutritional impacts, and an assessment of forces hindering or helping the policy implementation.

***NUTR 5302 Nutrition Informatics: 3 semester hours.***
This course examines how the implementation of electronic health record (EHR) and health information technology (HIT) transformed nutrition delivery documentation, follow up and evaluation. Nutrition Informatics covers the retrieval, organization, storage and use of data for food and nutrition problems and decision making.

***NUTR 5303 Biostatistics: 3 semester hours.***
This course teaches the statistical methods and principles necessary for understanding and interpreting data used in nutrition, health care, public health, and epidemiology. Topics include descriptive statistics, inferential statistics, graphical data summary, sampling, statistical comparison of groups (, t-tests, chi-squared, ANOVA), correlation, and regression. Students will learn via lecture, group discussions, critical reading of published research, and analysis of data using SPSS, SAS, and STATA.
Prerequisites: MATH 2003 or MATH 1342.

***NUTR 5310 Nutrition Assessment: 3 semester hours.***
This course will examine the types of nutritional assessment systems used for research, clinical evaluations, and community estimates for decision making. The use of the most frequently encountered bio markers, indices and indicators of nutritional status and their interpretation will also be covered.
Prerequisites: (HUNF 3603 or HUNF 3360) and (HUNF 3673 or HUNF 3367).

***NUTR 5311 Nutrition and Public Health: 3 semester hours.***
The course is designed to provide students with understanding and competencies in assessing the factors which influence the nutritional status of the population; in identifying the resources in the community available to address nutrition and health problems; in conducting a community assets and needs assessment; and engaging the community in problem-solving. Also addressed are issues related to the changing nature of general health care and public health nutrition services
Prerequisites: (HUNF 3673 or HUNF 3367) and (HUNF 4693 or HUNF 4369).

***NUTR 5312 Social and Cultural Influences on Nutrition: 3 semester hours.***
This course explores connections between what we eat and who we are through cross-cultural study of how personal and collective identities, social relations, and economic inequalities are formed and maintained via practices of food production, preparation, and consumption.

***NUTR 5313 Nutrition & Metabolism I: 3 semester hours.***
This course covers nutritional biochemistry; digestion, absorption, transport, function, regulation, and metabolism of macronutrients; relationships between dietary intake, metabolic pathways, and the pathogenesis of health.

***NUTR 5314 Nutritional Epidemiology: 3 semester hours.***
This course will cover research strategies in nutritional epidemiology and methods of dietary assessment using data on food intake, biochemical indicators of diet, and measures of body composition and size.

***NUTR 5315 Global Nutrition: 3 semester hours.***
The course explores the impact of nutrition and health disparities internationally resulting from inadequate nutrition throughout the lifecycle. Student will evaluate the international health and nutrition organizations, policies and interventions. The increased role of the dietitian in creating and implementing international interventions and affecting public health policy will be explored.

***NUTR 5320 Food Nutrition & Communication: 3 semester hours.***
The course explores current trends and the use of social media as an effective tool in dietetics practice. The course gives the students an opportunity to practice food styling and writing a supportive article for possible submission to Today’s Dietitian.

***NUTR 5322 Nutrition Education & Counseling: 3 semester hours.***
Students preparing for careers in nutrition and dietetics are expected to gain competency for professional practice in a wide range of disciplines and be able to translate nutrition sciences effectively into plain language for people who want to change their eating behaviors, lifestyle, and energy expenditure to improve their health.This course will increase and refine the student's pre-professional experience in helping people change their eating habits for improving their health and reducing the risk of chronic diseases.

***NUTR 5323 Nutrition & Metabolism II: 3 semester hours.***
This course covers nutritional biochemistry; digestion, absorption, transport, function, regulation, and metabolism of micronutrients; relationships between dietary intake, metabolic pathways, and the pathogenesis of health.
Prerequisites: NUTR 5313.

***NUTR 5326 Capstone Project: 3 semester hours.***
Independent final paper exploring a topic of interest, emerging from a specific area in Nutritional Sciences under the supervision of a faculty advisor.

***NUTR 5633 Advanced Practicum in Dietetics: 6 semester hours.***
Preplanned experience at the professional level in dietetic administration, food service management, clinical and therapeutic nutrition and community and public health nutrition.

***NUTR 6306 Thesis: 3 semester hours.***
Independent research work on a specific area in Nutritional Sciences under the supervision of a thesis advisor.