Agribusiness

AB 366 3-0-3 Elementary Methods of Quantitative Analysis in Agribusiness: This course is designed to develop broad-based quantitative skills useful in decision-making and research situations in the agribusiness and agriculture-related industries. Emphasis will be placed on the use of elementary calculus and statistical methods applied to selected economic and managerial problems; linear and nonlinear relationships; mathematical models and their applications in agribusiness; case and applied problems related to agribusiness and agriculture.

AB 392 3-0-3 Agribusiness Marketing: This course covers a systematic examination of market structure, conduct and performance in the various sub- sectors of production agriculture and the agribusiness system. Special attention will be given to the following: factors affecting prices, study of marketing channels and agencies, agricultural and agribusiness cooperatives, and strategies for managing the marketing mix. This course is cross-listed with AE 356.

AB 395 3-0-3 Agricultural Commodity Futures: This course introduces students to the theory and practice of commodity futures and options. The course covers the fundamentals of futures contracts and trading, basis and theoretical price relationships, market equilibrium and performance, commodity futures hedging, options on futures and regulations and policies affecting futures markets.

AB 472 3-0-3 Risk Management in Agribusiness: This course is designed to teach students techniques and procedures used in agriculture and agribusiness to address production, marketing, financial and operational risks. The course involves intensive coverage of production and marketing contracts, enterprise diversification, crop insurance through government programs and the private sector, commodity futures hedging, financial planning and management as well as other efficient risk management strategies used in liberalized agricultural markets.

AB 491 3-0-3 Agribusiness Management: Intensive study of management concepts and techniques applied to decision-making situations and problems encountered by agribusiness firms. Emphasis is placed on agriculture businesses and firms in the transportation, storage, manufacturing and distribution of agricultural inputs, products and services.

AB 493 3-0-3 Farm and Ranch Appraisal: Study of factors that affect the value and price of agricultural land and other real estate. Various approaches used in real estate valuation are covered. Students are required to do the appraisal of a farm, ranch or home and prepare an appraisal report.

AB 494 3-0-3 Agribusiness Internship: This course must be taken by all agribusiness majors between the sophomore and senior year. The course is taken by correspondence while the student is completing internship training with an agribusiness firm or government agency. The student's performance is evaluated by the advisor on campus and the supervisor in industry. All students are required to write and present an internship report.

Agricultural Economics

AE 111 3-0-3 Fundamentals and Concepts in Agriculture: This course is taken or challenged by all students majoring in Agriculture. The course may be challenged by any student. This course is designed to provide those competencies and experiences needed by students in Agriculture, which will assist the student in his/her achievement in subsequent courses taken and in the world of work.

AE 213 3-0-3 Principles of Agricultural Economics: This course teaches fundamental concepts and theories of microeconomics. It applies economic principles to current problems and issues in agriculture and agriculturally related industries. General economic principles are covered such as supply and demand relationships, microeconomics versus macroeconomics, elasticity and introduction to production economics. A primary mission of the course is to prepare students for more advanced courses in economics, agricultural economics, agribusiness and technical agriculture.

AE 214 3-0-3 Agricultural Finance: A study of financial concepts and principles that are used in managing the financial resources of a firm. Specific attention will be given to financial management problems related to the operation of agricultural businesses, capital and credit needs of farmers, agencies supplying credit, problems of borrowers and lenders, insurance and taxation.

AE 215 3-0-3 Agricultural Finance: A study of financial concepts and principles that are used in managing the financial resources of a firm. Specific attention will be given to financial management problems related to the operation of agricultural businesses, capital and credit needs of farmers, agencies supplying credit, problems of borrowers and lenders, insurance and taxation.

AE 325 3-0-3 Farm Records and Accounts: This course focuses on developing a basic understanding of the interaction between physical and economic phenomena applicable to the allocation and use of resources, and techniques for developing solutions from the standpoint of improving the efficiency of the farm business. Specifically, the course is designed to introduce students to farm record keeping and accounting principles; provide an in-depth discussion of how farm records and accounts affect the decision-making process and farm management; explain pertinent and relevant economic concepts and principles that affect farm planning and management, and discuss different aspects of enterprise budgeting in whole farm planning.

AE 346 3-0-3 Agricultural Price Analysis: This course provides students with an understanding of the complex array of forces that influence the level and behavior of agricultural and other commodity prices. It also introduces students to empirical studies and analytical techniques that are useful in predicting economic changes or the economic consequences of price behavior and changes. Although the agricultural sector is a declining component of most national economies, agriculture and agricultural product prices remain important both economically and politically. They strongly influence the level of farm income and in many countries, the level of food and fiber prices are important determinants of consumer welfare and the amount of export earnings.

AE 356 3-0-3 Marketing of Agricultural Products and Cooperatives in Agriculture: This course provides a clear understanding of pure and applied principles involved in the marketing of agricultural commodities and to examine how producers, consumers, and middlemen are affected by the marketing process. To study the methods followed and agencies engaged in marketing farm products, services performed, factors affecting prices, and a study of market channels, to marketing agricultural products through cooperatives. Principles underlying the establishment and operation of cooperatives will be given special consideration.

AE 365 3-0-3 Microeconomics in Agriculture: Develop understanding of and appreciation for differences in trade policies, agricultural systems, resource endowments, populations and production possibilities in Developed and Lesser Developed nations; build understanding of theory and policy options that are likely to help resolve food availability problems; complete an intensive study of the overall economic/ agricultural sector in a selected country or region of the world and identify policies which might help resolve problems of economic growth and nutrition.

AE 438 3-0-3 Research in Agricultural Economics: This course will focus on research philosophy and techniques, collecting data, handling data and evaluating studies in agricultural economics. It is specifically designed to improve student research writing proficiency as well as to give students a broad understanding of the philosophy of research and of research techniques in agricultural economics.

AE 463 3-0-3 Agricultural Statistics: This course emphasizes the basic ideas and procedures of statistical analysis as applied to economic and business problems in agriculture. Special attention will be given to the nature and use of statistical data, measures of central tendency, dispersion and other aspects of distribution, statistical inference, regression and correlation analysis. This course presupposes an introductory course in basic statistics. Pre-requisite: EC 307 or consent of instructor.

AE 467 3-0-3 Land Economics: This course provides for a study of the ways in which the use of land is affected by physical, institutional, and economic factors. Consideration is given to farm land prices, rents, taxes, tenancy, transfer of land, procedures in acquiring land, conserving and improving land. The latter phase of this course is devoted to farm law, and a brief study of some legal rules and procedures that are of particular importance to farmers.

AE 470 3-0-3 Consumer Economics: A study of the decision making of family units within the frame of reference provided by modern economics, while outlining the roles of consumers, producers and the government in our economic system. The remainder of the course focuses, the economic theory of a household's consumption, the relationship between consumption and saving and their effects upon income, demand and price in relation to types of market structure the contributing factors that influence an individual consumer's purchasing habits, personal finance and effective personal budgeting.

AE 475 3-0-3 Production Economics: This course will focus on economic analysis of agriculture production, including theory of the farm resource, allocation, production and cost functions, input-output analysis, farm size, enterprise combinations, tenure arrangements, risk, and decision making.

AE 478 3-2-4 Farm Organization and Management: A study of the principles underlying the successful organization and management of the farm as a business unit. Stress is placed upon the types and systems of farming followed, factors affecting the combination of enterprises, and factors affecting returns from farming. Field trips to actual farms will be taken during the course.

AE 478L 1-0-1 Farm Organization and Management Lab: A lab course that will study of the principles underlying the successful organization and management of the farm as a business unit. Stress is placed upon the types and systems of farming followed, factors affecting the combination of enterprises, and factors affecting returns from farming. Field trips to actual farms will be taken during the course.

AE 488 3-2-4 Agricultural Problems and Policies: A critical study of agricultural problems past and present that have involved various levels of government action. The development of various programs and agencies that have worked to solve these problems will be considered. Special attention will be given to important problems common to small farmers and how government policies have affected these farmers.

AE 495 3-0-3 Cooperatives for Limited-Resource People: A study of the organization and operation of cooperatives for limited-resource people. To identify the problems and opportunities associated with women and men, who united voluntarily to meet their economic, social and culture needs and aspirations through a jointly owned and democratically controlled enterprise.

AE 497 3-0-3 Seminar in Agricultural Economics: This seminar is designed to introduce students to current topics/events in Agricultural Economics. This seminar also serves as a forum for students to present their final papers to faculty and students.

Agricultural Engineering

AG 315 1-4-3 Farm Mechanics I: This course is designed to provide information necessary for planning, operating and maintaining a vocational agriculture or farm mechanics facility.

AG 316 1-4-3 Farm Mechanics II: Emphasis will be placed on the development of orderly and safe laboratory procedures for many practical skills to be developed. Pre-requisite: AG 315.

AG 418 1-4-3 Farm Surveying and Drainage: Develop understanding of irrigation and drainage problems concerning ditches and wells. The use of survey or leveling equipment will be applicable to this course as fields are prepped for irrigation systems. Emphasis will be placed on the location, design, and construction of drainage systems on the farm and land surveying for acre and mapping farms.

AG 437 1-4-3 Agricultural Machinery: The care, operation, and maintenance of farm machinery, with emphasis on agricultural equipment.

AG 438 1-4-3 Agricultural Farm Building: Planning, maintaining, laying out, and constructing farm buildings and structures. AG 439 1-4-3 Internships. This internship will provide students with industry, government or academic settings for direct work experience.

AG 439 1-4-3 Internship: Work experience.

AG 448 1-4-3 Terracing (Water Management): This course details the field practice of laying out, constructing, and maintaining terraces, terrace outlets and diversion ditches; as a soil conservation practice applied to prevent rainfall runoff on sloping land from accumulating and causing serious erosion.

AG 458 1-4-3 Special Problems: This is primarily for students who desire to develop their skills in farm shop.

AG 468 1-4-3 Advanced Problems in Agricultural Engineering: The process of design is presented along with methods to solving engineering problems, manipulations and presentations of engineering data, and practical engineering concepts. Primarily for in-service teachers who have a need for improving their abilities in certain areas of farm mechanics.

AG 477 1-4-3 Agricultural Power and Machinery: The care, operation and maintenance of farm machinery with emphasis in mechanization and cybernation.

AG 478 1-4-3 Agricultural Power and Machinery: A continuation of AG 477.

AG 480 1-4-3 Small Gasoline Engines: The care and maintenance of small two cycles and four cycle engines.

AG 484 1-4-3 Agricultural Mechanics and Technology: This course is concerned with designing and design modification of agricultural machinery.

AG 485 1-4-3 Agricultural Power and Machinery Management: A course developed to enhance skills in efficient selection, operation, repair and maintenance, replacement, and management of agricultural machinery. The principles of operation and repair of agricultural hydraulic equipment and current and future trends in agricultural machinery design and technology will also be emphasized.

AG 486 1-4-3 Agricultural Seminar: A review and discussion of current topics in Crop Production and Soil Management. Students will report on and discuss recent literature and current investigations relative to the Crop Production and Soil Management and preparation of reports on selected topics.

AG 499 1-0-3 Thesis Research/Thesis: This course will introduce students to the rules governing the development of a thesis document from scientific research. Students will be required to develop short papers form topics. Further, students will be presented with strategies of developing a research project that can be written in thesis format. Extensive exercises requiring independent topic research is required. Writing styles and experimental design will be emphasized.

Agricultural Education

AN 300 3-0-3 Introduction to Agricultural Communications: This course designed to prepare students to understand, analyze, and communicate about complex issues in food, agriculture and the environment. Students will be provided a foundation in basic and advanced communication theories, models and practices that apply within agricultural settings. Introduce students to the related fields of employment including, but not limited to, public relations, sales management, marketing management and communications management.

AN 315 3-0-3 Principles and Philosophy of Teaching Vocation Education: This course provides opportunities for students with an interest in teaching to develop skills, strategies, and techniques used for instructions at various grade levels. Instruction addresses the legal and social aspects of vocational education; objectives, ideals, principles, values, philosophies, and standard practices employed in training for specific vocations. Explore the principles of learning and teaching, child guidance, classroom management, growth and development of children, curriculum development, and issues in education

AN 316 3-0-3 Special Methods of Teaching Agriculture: The primary goal of this course is to prepare students in methods of teaching vocational agricultural education to K-12 students. The course focuses on methods of active learning and strategies for managing student behavior and utilizing instructional technology that engages all students in school and community based agriculture programs. The student will participate in observation and instruction in a high school classroom, leadership development activities of the FFA, and supervised agriculture experience activities.

AN 318 3-0-3 Career Education: This course provides students with background information relevant to careers and career education with emphasis in teaching on the secondary level. Allows students to develop knowledge and skills regarding other career opportunities, personal development, globalization, industry standards, details, practices and expectations.

AN 320 3-0-3 Leadership: This course will actively engage students in the acquisition of information about historical and contemporary theories, concepts, and issues associated with leadership. Students will be exposed to the nature of leadership through presentation of objective material, through group activities, and through laboratory exercises. The course assist students in developing a knowledge and understanding of leadership theory and basic skills required to perform effectively in leadership positions.

AN 437 3-0-3 Directed Teaching in Agriculture: This course employs methods, techniques, experience, and practice of teaching agriculture in-school and out-of-school students with much emphasis given to advising FFA and managing a high school Department of Agriculture. Develops the ability to plan, manage, develop, and evaluate curricula (Student Teachers Only).

AN 459 3-0-3 Advanced Agricultural Education: This course is designed primarily for in-service teachers of Vocational Agriculture and county agriculture educators. It provides for a review of course building and program planning for a specific community.

AN 465 3-0-3 Planning Instructional Programs for Out of School Students: This course is designed to develop and implement programs for adults. Provides instruction in the planning, organization, and management of several types of vocational education facilities and an introduction to the different organizational and delivery systems used in Vocational Education programs. Special emphasis will be given to students who plan to teach Vocational Agricultural Education and work with Cooperative Extension.

AN 468 3-0-3 Program Building: This course provides for a review of teaching programs for in school and out of school adult classes in vocational agriculture; the building of community programs of work and the organization of community groups for the execution of community programs.

AN 470 3-0-3 Cooperative Education: This course covers problems and practices of the extension and the analysis of procedures for developing and implementing Agricultural Cooperative Programs with emphasis on the high school level. Additional topics will include adaptations for disadvantaged students, motivation and learning environment management, and adult learners.

AN 478 3-0-3 Extension Organization and Methods: This course provides for a review of problems and practices of extension educators. Develop and/or induce innovations which help to resolve problematic situations.

AN 479 3-0-3 Advanced Agricultural Education: This course is designed primarily for in-service teachers of Vocational Agriculture and county agriculture educators. It provides for a review of course building and program planning for a specific community.

AN 480 3-0-3 Problems and Trends in Vocational Education: A survey of problems and developments in Vocational Education as indicated by recent legislation and research. The literate will be selected to focus attention on current and future trends regarding organization, course content, and procedures in Vocational Education at the secondary school level. Students are encouraged to make special studies in their particular areas of interest. (Seniors Only)

AN 484 3-0-3 Occupational Information: An introduction and exploration of the world of work; a study of principles, classification and content inherent to the various occupations in agriculture with emphasis directed toward teaching.

AN 487 3-0-3 Vocational Education Curriculum and Techniques of Teaching the Rural Disadvantaged: An analysis vocational curriculum and teaching techniques with emphasis directed towards special needs of the disadvantaged and the handicapped.

AN 491 3-0-3 Research or Independent Study: This course is limited to superior senior agricultural students who are invited to join the honors program.

AN 492 3-0-3 Independent Study: This course is a continuation of course AN 491.

AN 493 1-0-1 Agricultural Problems: This course embraces a study of problems and research in agriculture. Special emphasis is placed on communication among various professions, industry, and government. Emphasis will be placed on proper procedures in seeking employment. (Seniors Only).

Animal Science

AS 100 3-0-3 Introduction to Land-Grant Program: This course covers the concepts and issues important for early orientation of all students considering a career in agriculture and life sciences, a review of state, national, and international agricultural issues, and a historical review of land grant programs.

AS 103 1-4-3 Poultry Production: This course provides an introduction to the, poultry industry. Topics include anatomy and physiology, reproduction, incubation, environmental issues, and husbandry. Upon completion, students should be able to demonstrate a basic understanding of poultry production and the economic and environmental impact of the poultry industry locally, regionally, state-wide, and internationally.

AS 103L 1-01 Poultry Production Lab: This course will provide real-time hands on learning with the practices discussed in AS103 - Poultry Production class.

AS 111 3-0-3 Poultry Production: This course provides an introduction to the, poultry industry. Topics include anatomy and physiology, reproduction, incubation, environmental issues, and husbandry. Upon completion, students should be able to demonstrate a basic understanding of poultry production and the economic and environmental impact of the poultry industry locally, regionally, state-wide, and internationally.

AS 111L 1-0-1 Poultry Production Lab: This course will provide real-time hands on learning with the practices discussed in AS 111- Poultry Production class.

AS 105 3-0-3 Milk and Milk Products: This course is an introduction to the manufacture of dairy products. Dairy processing procedures from the farm, through the dairy plant, and to the consumer are studied.

AS 213 1-4-3 Animal Production: This course is an introduction to the role of farm animals in providing food and other products to humans. A study of general principles and practices, including basic terminology common to animal science, common breeds of farm animals, basic principles of feeding, reproduction, breeding and management of farm animals will also be covered. Special emphasis will be placed on the development of the livestock industry and producing animals fit for market.

AS 213L 1-0-1 Animal Production Lab: This course will provide real-time hands on learning with the practices discussed in AS213- Animal Production class.

AS 214 3-0-3 Dairy Production: This course is an introduction to the production phase of the dairy industry. Topics covered include animal selection, feeding, breeding, herd health, and management practices important to quality milk production.

AS 214L 1-0-1 Dairy Production Lab: This course will provide real-time hands on learning with the practices discussed in AS214 - Dairy Production class.

AS 216 1-2-3 Swine Production: This course will deal with the importance and characteristics of the U.S. Swine Industry. Emphasis will be placed on Swine enterprises, building, and systems of production, management of breeding herd, environmental control, selection or replacements, feeding, diseases, and marketing.

AS 223 1-4-3 Dairy Production: The mild production, feeding, judging, fitting, breeding and management of dairy animals for the market.

AS 228 3-0-3 Meat and Livestock Judging: This course aims to provide students with knowledge of the procedures for evaluating, selecting, grading and judging breeding animals and slaughter animals, their carcasses and their wholesale cuts.

AS 228L 1-0-1 Meat and Livestock Judging Lab: Students will learn to read and understand a livestock market report, apply the USDA standards for livestock and carcass grades used in pricing and marketing, understand the relationship of live and carcass grades and their roles in value determination and marketing of livestock and meat products, and understand and be able to use all marketing methods currently used in the beef and pork industry.

AS 233 1-4-3 Meat and Meat Products: This course is an introduction to the economic and nutritional values of meat and meat products. Topics include processing facilities, meat carcasses (major cuts and chemical composition), structure and functions of meat muscle, postmortem changes in meat muscle, factors affecting meat palatability, meat type identification, poultry slaughter and processing, chemical and physical characteristics of fish, meat, poultry and fish preservation and storage, meat and fish processed products (cured meat products, sausages, smoked meat, dried meat, canned meat, canned fish, smoked fish and dried fish products) and meat, poultry and fish by-products.

AS 233L 1-0-1 Meat and Meat Products Lab: Students will learn to read and understand a livestock market report, apply the USDA standards for livestock and carcass grades used in pricing and marketing, understand the relationship of live and carcass grades and their roles in value determination and marketing of livestock and meat products, and understand and be able to use all marketing methods currently used in the beef and pork industry.

AS 243 3-0-3 Meats and Meat Products: Selection of meat animals: killing, cooling, cutting, curing, preserving, and cooking of meats.

AS 303 3-0-3 Livestock Judging: This course is designed to train students to visually evaluate livestock and to verbally justify their conclusions. At the end of this course, students should be able to understand the scoring system used in livestock judging contests and be able to tabulate scores, learn to prepare a logical, coherent set of notes that allow you to present an effective set of oral reasons, to present articulate oral reasons, interpret individual performance data and EPD, recognize and identify various parts of a live animal and subsequent portions of a carcass, to understand the mechanics of valuation of a market animal, and develop the confidence to compete in a structured livestock contest.

AS 313 3-0-3 Beef, Sheep and Swine Management: The goal of this course is to provide all students instruction in establishing and managing agricultural animal enterprises; includes instruction in selecting, breeding, feeding, caring for, and marketing beef cattle, swine, and sheep.

AS 313L 1-0-1 Beef, Sheep and Swine Management Lab: This course will provide real-time hands on learning with the practices discussed in AS 313 - Beef, Sheep and Swine Management.

AS 323 2-2-3 Livestock Disease and Sanitation: This course provides an introduction to animal health and environmental factors related to the livestock industry. Topics include water and milk pollution, disinfectants and methods of disinfecting; common diseases of animals and poultry in the region, occurrence, methods of disease transmission and preventive measures of disease spread; basic knowledge of vaccination programs; and lastly, hygienic conditions and sick animal handling and isolation.

AS 326 3-0-3 Therapeutic Agents: The aim of this course is to provide students with an understanding and knowledge of therapeutic agents. The course particularly covers the mechanisms of various drug actions, the PD/PK principles that are fundamental for the therapeutic uses and safe selection of therapeutic agents in clinical veterinary practice. In addition, students will also gain knowledge of important aspects of toxicology and therapeutics.

AS 333 3-0-3 Poultry Management: This course aims to provide knowledge in management practices including physiology, breeds and breeding, health maintenance, nutrition and feeding, housing and waste management, equipment, incubation (including hatchery management) and brooding in the poultry industry. The rearing of breeder flocks, layers and broilers, records, maintenance, handling, processing and marketing of poultry products will also be covered.

AS 336 3-0-3 Parasitology of Farm Animals: This course introduces students to various parasitic problems of farm animals. It is an exploratory, first course in Parasitology designed primarily for students in animal production and health including allied disciplines. The practical aspect of the course focuses on identification of common helminthes, blood parasites and ectoparasites of farm animals. The course shall impart control methods on students of parasitic problems of livestock in order to boost production levels. Topics to be covered include terminologies in Parasitology; study of nematode, trematode and cestodes of economics importance to farm animals; vectors and ectoparasites -lice, fleas, ticks and vector flies.

AS 343 3-0-3 Physiology and Anatomy of Farm Animals: The course is designed to introduce students to the basic and fundamental concepts of domestic animal anatomy and physiology. Topics will include a survey of structure and function of the animal body systems and a study of their interrelationships; function of cellular components; cell division and metabolism; and economically important aspects of body form and functions. By learning and understanding fundamental concepts, students will be able to apply this knowledge to other advanced Animal Science courses.

AS 343L 1-0-1 Credit hour Physiology and Anatomy of Farm Animals Lab: This course will provide real-time hands on learning with the practices discussed in AS 343- Physiology and Anatomy of Farm Animals class.

AS 346 3-0-3 Beef, Sheep and Swine Management: The goal of this course is to provide all students instruction in establishing and managing agricultural animal enterprises; includes instruction in selecting, breeding, feeding, caring for, and marketing beef cattle, swine, and sheep.

AS 346L 1-0-1 Beef, Sheep and Swine Management Lab: This course will provide real-time hands on learning with the practices discussed in AS 346- Beef, Sheep and Swine Management.

AS 353 2-2-3 Introduction to Nutrition: This course provides an introduction to the digestive anatomy of various species and the classes of nutrients including their digestion, metabolism and sources. Topics include nutrient requirements and feeding standards for livestock, companion animals, exotics and aquatics for purposes of reproduction, lactation, growth, work and maintenance; classes of feedstuffs, their characteristics, proper utilization, formulating rations and nutritional programs for animal enterprise.

AS 363 2-2-3 Animal Management: This course provides principles of sustainable livestock management in beef cattle, swine, goat and sheep. Topics include the management of feeds/feeding, breeds/breeding, animal health and livestock economics; livestock facilities – housing / farm structures and handling facilities; general livestock routine management procedures; livestock identification; livestock records and records keeping; and disease prevention and treatments.

AS 413 3-0-3 Animal Nutrition: This course provides an introduction to the digestive anatomy of various species and the classes of nutrients including their digestion, metabolism and sources. Topics include nutrient requirements and feeding standards for livestock, companion animals, exotics and aquatics for purposes of reproduction, lactation, growth, work and maintenance; classes of feedstuffs, their characteristics, proper utilization, formulating rations and nutritional programs for animal enterprise.

AS 423 3-0-3 Livestock Breeding: The student will be introduced to basic concepts in principles of applied animal breeding and genetics for improvement of animal production. In addition, modes of inheritance and types of gene action involving simply inherited and polygenic traits will be covered, as well as mating plans and systems involving pedigree and mass selection, inbreeding, line breeding and crossbreeding. An introduction to basic genetic evaluation procedures and predictions of an animal's genetic merit for economically important traits will be presented.

AS 423L 1-0-1 Livestock Breeding Lab: This course will provide real-time hands on learning with the practices discussed in AS487 – Livestock Breeding class.

AS 439 3-0-3 Internship: The objective of an internship is to gain hands-on- experience in the student's chosen field of animal science. This internship may be conducted on or off campus, however, it is desired that students have off campus internships.

AS 440 3-0-3 Internship: The objective of an internship is to gain hands-on- experience in the student's chosen field of animal science. This internship may be conducted on or off campus, however, it is desired that students have off campus internships.

AS 443 2-2-3 Principles of Dairy Manufacturing: This course focuses on the essential principles that must be mastered for a person to be effective in manufacturing dairy production work. The course covers customers, quality principles and processes, systems, information in the workplace, the business of manufacturing, and statistical process control of dairy products.

AS 453 2-2-3 Physiology of Lactation: This course covers the anatomy of the mammary gland and physiology of lactation in domestic and laboratory mammals with emphasis on dairy cattle. It also covers mammary gland health and factors affecting lactation as well as the principles and techniques in dairy herd milking management.

AS 453L 1-0-1 Physiology of Lactation Lab: This course will provide real-time hands on learning with the practices discussed in AS 453- Physiology of Lactation class.

AS 463 1-0-0 Hatchery Management: This course provides insight in the management of hatching poultry. It will provide an introduction o\to artificial incubation and hatching, embryonic development, physiological requirements for incubation, handling of hatched eggs, hatchery layouts, scheduling, and record-keeping, microbial monitoring, post hatch chick quality, genetic flow in the poultry industry, breeder selection strategies, and layer breeder flock management.

AS 473 3-0-3 Layer Management: This senior level course is designed to assist students in learning different layer breeds, production management, housing, nutrition, feeds and feeding management and production economics of layers.

AS 478 1-4-3 Seminar in Animal Science: Senior level course designed to assist students in formatting and presenting a comprehensive seminar based on their cumulative educational experiences as emerging animal scientists. Furthermore, this course will develop student's argumentation skills. Argumentation skill is the development of logical explanations and reorganizations of opposing assertions, weights of evidence, and determination of merit for each assertion with regards to evidence. Class participation will be critical in evaluating peers and for developing a student's argumentation skills while widening student's breadth of knowledge in a wide range of topics pertaining to the animal sciences. At the conclusion of this course students will be able to: 1. Identify public speaking Dos and Don'ts 2. Generate constructive feedback to your peer 3. Summarize the basic tenants of argumentation 4. Support arguments with weights of evidence 5. Assess and report on major issues facing the animal livestock industry.

AS 483 3-0-3 Feeds and Feeding: This class provides insight into the chemical composition of feedstuffs, requirements of domestic animals, utilization of nutrients, and formulating and balancing rations.

AS 485 3-0-3 Physiology of Reproduction: This course is an introduction to the basic anatomical differences among the reproductive systems of various species and the physiological and endocrine mechanisms involved in regulation of reproduction. Some reproductive management will be included with an emphasis on traditional livestock.

AS 485L 1-0-1 Physiology of Reproduction Lab: This course will provide real-time hands on learning with the practices discussed in AS 485- Physiology of Reproduction class; including palpation and ultrasound techniques.

AS 487 3-0-3 Livestock Breeding: The student will be introduced to basic concepts in principles of applied animal breeding and genetics for improvement of animal production. In addition, modes of inheritance and types of gene action involving simply inherited and polygenic traits will be covered, as well as mating plans and systems involving pedigree and mass selection, inbreeding, line breeding and crossbreeding. An introduction to basic genetic evaluation procedures and predictions of an animal's genetic merit for economically important traits will be presented.

AS 487L 1-0-1 Livestock Breeding Lab: This course will provide real-time hands on learning with the practices discussed in AS487 – Livestock Breeding course.

AS 490 3-0-3 Principles of Dairy Manufacturing: This course focuses on the essential principles that must be mastered for a person to be effective in manufacturing dairy production work. The course covers customers, quality principles and processes, systems, information in the workplace, the business of manufacturing, and statistical process control of dairy products.

International Agriculture

IA 302 3-03 Economics of Agricultural Development and Trade: This course will examine the processes of economic growth and agricultural development overtime and in various parts of the world. Special emphasis will be placed on theories of economic and agricultural development; poverty; globalization; and the institutional factors likely to influence the agricultural sector in developed and developing countries. Development economics focuses on the poorest two- thirds of the world's population. These are the vast majority of people in developing countries; many of them are inadequately fed and housed, in poor health and are illiterate. The course will help to provide a better understanding of a number of the critical questions relating to the economics of the developed and developing world as well as the prospects for global integration.

IA 482 3-03 Economics of World Food Production and Distribution: This course focuses on developing a basic understanding of and appreciation for differences in trade policies, agricultural systems, resource endowments, populations and production possibilities in Developed and Lesser Developed nations; build understanding of theory and policy options that are likely to help resolve food availability problems; complete an intensive study of the overall economic/agricultural sector in a selected country or region of the world and identify policies which might help resolve problems of economic growth and nutrition.

IA 510 1-4-3 Research Development: Students in this course will continue the self-assessment and career awareness process. In addition, students will also focus on career preparation and will get ready to transition to a formal, supervised work experience, as well as, refine their plan for employment, education, and training.

Plant and Social Science

PS 122 3-0-3 Crop Production: This course deals with the study of agronomic and horticultural crop production. Provides students with an understanding of the basic principles of field crop production – tillage, soil testing, fertilization, variety selection, planting, and in-season crop management. The lecture classes cover studies on soil management, fertilizer application, cultivation, agronomic practices, harvesting, and "model" crops will be discussed to assist students in preparing for a career in agriculture or the agricultural sciences.

PS 122L 1-0-3 Crop Production Lab: This laboratory covers practical training in lab, greenhouse, and field. The crop fields include vegetable plots, vineyards, orchards, and nut plantations. Lab activities include organic and non-organic production of major vegetable crops. Students will learn basic production techniques and cultural practices used for horticultural crop production including principles and practices involved in the propagation of horticultural plants, fruit crop establishment and management, and cultural requirements essential to successful vegetable cropping.

PS 205 3-0-3 Principles of Genetics: This introductory genetic course covers classical Mendelian genetics, extension of Mendelism, gene structure, function, and regulation, gene mutations and effect on gene function, synthesis and duplication of genetic materials, population genetics and evolution, genetic screening and gene therapy.

PS 220 3-0-3 Principles of Cell and Tissue Culture: This course presents an overview of the techniques and underlying theory of plant tissue culture and genetic engineering, research and commercial applications. The course is designed to provide knowledge of the basic principles and application of tissue, cell and protoplast culture, recombinant DNA technology and genetic transformation of plants and their application to plant improvement.

PS 221 1-0-1 Principles of Cell and Tissue Culture Lab: This course should be taken concurrently with PS220 "Principles of Cell & Tissue Culture". This laboratory intensive course will expose students to laboratory cell and tissue culture equipment and techniques; Callus induction and cell suspension culture; plant genetic transformation experiment design and practices.

PS 242 3-0-3 Wood Products: This course explains the industrial materials formulated from harvested trees in the forest (s). Many wood industries assumed strange roles that produced the products that are household names today. This course will relate the history of the wood products we use in today's market.

PS 257 3-0-3 Wood Science and Technology: This course utilizes the industrial techniques to characterize wood properties and the chemical structure of wood in the manufacturing process; the fundamentals of wood mechanics including concepts of stress, strain, bending, and effects of moisture on mechanical properties. This course explains the application of techniques to production planning, inventory management, quality, human resources management, and technology.

PS 257L 1-0-1 Wood Science and Technology Lab: The aim of this course is to better understand how the management of forests and the assessment of wood properties and research into the factors that affect the properties of wood and ways of improving the performance of analyses of wood substances.

PS 270 3-0-3 Environmental Ecology: This course introduces the principles of ecology and their implications for analyzing environmental problems. Attention will focus on understanding the processes controlling the dynamics of populations, communities and ecosystems. Specific examples will emphasize the application of these concepts to the management of natural resources and environmental stressors associated with human activities.

PS 300 3-0-3 General Bioethics: Ethics is the study of how we ought to live. In this course, we will study the ethical issues involving biotechnology. We hear about euthanasia, abortion, genes, genomes, and health care in the news almost nightly. The ethical issues that accompany these new technologies are enormous, and force us to reexamine what words like person, death, fair, right, and consciousness mean. These issues cluster roughly around five concepts: reproduction and birth, death, genetics, healthcare, and the role of the physician. We will examine these issues from as many angles as possible and identify the moral issues raised by each and generate arguments for or against each position.

PS 305 3-0-3 Plant Development and Physiology: With the growing human population, it is a huge challenge to meet the food requirements of the future generations. Achieving the food security depends on the successful cultivation and obtaining best crop yields. To achieve greater yields in-depth understanding of crop physiology and growth regulation are vital. This course will introduce the fundamentals of crop physiology and plant growth regulation. Specifically, the course deals with the architecture of plant cell, photosynthesis, metabolism of macro molecules, secondary metabolites and plant hormones.

PS 315 2-2-3 Soils: This foundational course introduces students to a broad disciplines of soil science. Study soil formation, composition and a range of soil characteristics that seek to understand their relationship to soil function, land use, plant growth, and environmental quality. Identify the physical, chemical, and biological properties and processes of soils and relate these to soil function. Students acquire a working knowledge of the technical terminology of soil science and begin developing application skills that can be applied in environmental and natural resource management careers. Students also evaluate the impact of land use and management decisions on agricultural productivity, sustainability, and environmental health.

PS 315L 2-2-3 Soils Lab: This laboratory course is designed for students who plan to work directly with soils, make land use and management decisions, or to be involved in projects requiring practical application of soil science. By conducting weekly laboratory and field exercises and writing reports on their work, students will deepen their understanding and learn to apply, the fundamental soil properties and processes. This laboratory course, in conjunction with the SOILS 315 lecture course, will provide foundational learning in soil science and prepare students for upper level soil science courses. This laboratory course is also designed to provide students with hands on experience in analytical procedures for soil assessment, testing, and interpretation.

PS 316 3-2-4 General Horticulture: An introduction to the principles and practices in the development, principles and practices applied to production and preservation of fruits and vegetables. Includes the classification, structure, growth and development, and environmental influences on horticultural plants. Additionally, we will identify emerging issues in horticulture and encourage robust discussion.

PS 316L 1-0-1 General Horticulture Lab: This is the lab course that will study the concepts outlined in PS316 General Horticulture course.

PS 320 3-0-3 Biomass and Bioenergy: The overall objective of the course is to introduce the concept of renewable energy and sustainability. The course will focus on opportunities of renewable resources and their utilization for energy production. The bioenergy will focus on past present and future potential. A brief history of bioenergy and bioproduct development. Recent developments in bioenergy such as biomass feedstock selection, bioprocess development, genetic engineering and socioeconomic impact. Policy and regulations in renewable energy specifically bioenergy. A lecture and laboratory model dissemination of knowledge. Students are asked to present a research relevant to the bioenergy and sustainability in groups.

PS 330 3-0-3 Introduction to Biotechnology: This course will introduce the basic concepts in biotechnology and will cover concepts that are more pertinent to plants like plant genetics, molecular biology, genetic engineering, etc.

PS 330L 1-0-1 Introduction to Biotechnology Lab: This lab course is designed to complement the lecture course PS330 Introduction to Biotechnology and core biotechnology laboratory techniques will be studied.

PS 338 2-1-3 Major Crops in Mississippi: This course covers production practices of major commercial grain and forage crops (soybeans, rice, corn, field peas and cotton) grown in Mississippi. Areas of focus include the principles of classification, varieties used, production practices, harvesting, marketing and seed production will be discussed from the production and management points of view.

PS 345 2-2-3 Landscape Gardening: This course begins with the fundamentals of gardening, including how to create and care for all types of plants and flowers, then provides a thorough introduction on all aspects and techniques of professional landscaping. This course is designed to train students for landscape service; nursery management; propagating and planting; growing and transplanting of ornamental plants.

PS 346 3-0-3 General Entomology: Fundamentals of structure, function, biology and identification of different insect groups. Study of principles, concepts and components of insect pest management. Pest management program in specific crops. Develop an extension pest fact sheet for pests, types of damage incurred, their biology and behavior.

PS 346L 1-0-1 General Entomology Lab: Laboratory exercises parallel topics presented in PS 346. The lab focuses on identifying common insects across all orders as well as developing skills in insect collecting, preservation, curation, and imaging.

PS 350 2-2-3 Forestry Taxonomy: The course will prepare you for practical tree identification in any environment through learning how to use taxonomic keys and exposure to terminology, family characteristics, and plant systematics. The course will require the student to learn common trees and the taxonomic system of classifying forest trees with emphasis on southern forests.

PS 350L 1-0-1 Forestry Taxonomy Lab: Laboratory exercises parallel topics presented in PS 350. Laboratory exercises will focus on the taxonomy and identification methods relevant to tree of southern forests.

PS 351 2-3-3 Forestry: A course designed to acquaint students with taxonomic system of classifying forest trees with emphasis on southern forests and the relationship of humans to forest resources. Lectures will cover basics of plant taxonomy and dominant forest types typical of various regions of the U.S; with emphasis on the roles of the forester in manipulating the forest environment to produce goods and services desired by contemporary society will also be discussed.

PS 351L 1-0-1 Forestry Lab: Laboratory exercises parallel topics presented in PS 351. The forestry lab provides students with hands-on application of forestry principles with or without having access to forest resources.

PS 353 2-3-3 Forestry Environment: A basic course on our environment emphasizing the relationship of forestry and the practical approaches required to assess the ecological condition of forests, which is necessary for forest management and conservation. This course will also explore the science, engineering, design, management and social science applied to regional, national, and global issues.

PS 354 3-0-3 Forest Pathology: The study of how insects and diseases destroy the forest will be discussed. The course will prepare the student to analyze the pathogens that can cause devastation to the forest which can prevent its good health. This course also will show how forestry is aimed at increasing yields of wood and fiber, and how insects, mammals, and disease destroy the economic value of the trees in the ecosystem. Disease is one of the slow processes that contribute to growth loss in trees. Types of tree diseases will be discussed and some factors that can be used to determine the mechanism which contributes to identification. The pathogens discussed will cover both abiotic and biotic. Finally, current studies in will be incorporated as discussion topics and scenarios to advance the knowledge of students in today's climate.

PS 358 3-0-3 Pest Management: An introduction to Integrated Pest Management (IPM): Concepts, principles, development and application of IPM. IPM constitutes a series of pest control tactics and strategies toward more sustainable agriculture, natural resources, and urban and rural health and well-being.

PS 360 1-4-3 Water Quality: This course examines the nature of point and non-point sources of surface and groundwater pollution, surveys the regulatory framework guiding water quality management activities in the U.S. It explains current approaches to water quality protection and enhancement and reviews the role of engineered treatment processes in water quality management.

PS 390 3-0-3 Biosafety and Risk and Management Agriculture: This course is designed to provide students with the principles, technologies and practices to safeguard humans and the environment from unintentional release or accidental exposure to biological agents or toxic chemicals and possible adverse effects of the products of biotechnology. Plant biosafety and the risk factors involved in working with biological agents will be covered.

PS 391 3-0-3 Concepts of Environment Science: This course is designed to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the human manipulation of ecosystems. Focuses on a brief history of the environmental movement, environmental regulatory agencies, fundamental principles of resources and their use, population, conservation, and environmental health. This course creates awareness to the possible irreversible situations of the fragile world environment, with emphasis on conserving the competency of the environment while exploring the science behind environmental issues.

PS 401 2-3-3 Small Fruit Production: This course will prepare student to recognize small fruit establishment and culture, with emphasis on kinds, varieties, seeding practices, cultural practices, and harvesting methods. The student will explore tree, vine and small fruit crop physiology and relationships among crop physiological status, horticultural manipulation, cultural management, economic determinants and maximized production of superior products. The course highlights seeding practices and culture, with emphasis on decision-making positions within the fruit industry.

PS 401L 1-0-1 Small Fruit Production Lab: Fruit crop production principles and practices, both locally and from a global perspective. Experience with planting, pruning and layout of orchard, vineyard and small fruit crops, greenhouse propagation, and production practices.

PS 403 3-0-3 Current Issues in Biotechnology: This course will deal with recent discoveries and concepts in biotechnology. The discussions will be focused on gene organization, gene transcription and translation; analysis and manipulation of genes and the applications of the biotechnology knowledge. Successful completion of this course material will enable the students to have a broad overview of molecular gene expression, and to undertake advanced study in any of the various sub-disciplines.

PS 418 2-2-3 Farm Forestry: This course will focus on how the principles, complexity and diversity of agroforestry systems enhance land productivity and sustainability. The principles of farm and woodland management including measurement of logs, trees and stands, planting and harvesting methods; illustration and protection; basic silvicultural principles. Emphasis will be on temperate zone agroforestry systems, in particular those suitable for, or having potential for, Mississippi. The social and economic benefits of such systems for farmers, communities and society will also be discussed.

PS 421 3-0-3 Wood Chemistry: The course discusses the chemistry of wood and its fundamentals and applications. The course will cover carbohydrate chemistry and the chemicals manufactured from wood. Chemistry and polymer properties of wood as well as the general structures, properties, and pertinent reactions of carbohydrates. It will also describe the structure and anatomy of wood. Emphasis will be placed on the major components of wood such as cellulose, hemicellulose, and lignin. Chemical processes such as wood pulping, pulp bleaching, cellulose derivatives, and wood-based chemicals and pulping by-products will give more depth to the chemical study of wood. A chapter on extractives will discuss the use of organic and inorganic chemicals obtained in the formations of heartwood components as well as bark.

PS 427 3-2-4 Farm and Home Beautification: This course deals with identification and description of ornamental plants materials, the care of lawns, landscape planting, plant propagation, establishment and care of lawns, and planning of the farm and home grounds. Topics include the farm fruit garden, vegetable garden, farm poultry, beautifying the home surroundings, the nutritive value of foods, cooking meats and vegetables, and educating the students on the farm literature for the farm home.

PS 427L 1-0-1 Farm and Home Beautification Lab: Laboratory exercises parallel topics presented in PS 427. Topics include the farm fruit garden, vegetable garden, farm poultry, beautifying the home surroundings, the nutritive value of foods, cooking meats and vegetables, and educating the students on the farm literature for the farm home.

PS 430 3-0-3 Concepts in Biotechnology: This course will provide a practical experience in the major techniques used in plant genetic analysis at the molecular and bioinformatics levels. It will teach students about all aspects of the biotechnology field. Topics will include the biology, cells, genes, DNA, proteins, genetic engineering, drug development, biofuels, agriculture, bioremediation, biotechnology company structure, and the regulations affecting the field. This course will increase the student's knowledge of major cellular and molecular concepts and techniques in molecular and cell biology.

PS 437 3-0-3 Soil Conservation and Land Use: Study the principles of soil conservation and land use with best management practices to improve soil functioning and protect the environment. The course will assess the importance of soil and water as natural resources for ecosystems and focus on developing methods for conservation and sustainable use of resources. Know the principles of soil erosion processes and management practices to decrease erosion in cropland, rangeland and urban systems. Understand the principles of the soil water cycle to improve water use efficiency in agricultural systems. Understand how to utilize soil resource assessment tools to make land management decisions. Examine the role of soil management in the mitigation and adaptation to climate change. Emphasis will also be given to proper land use based on land capability classes with reference to the State of Mississippi. Students will be required to develop a detailed soil conservation plan as a project for the class that will contribute as part of the grade for the course.

PS 439 3-0-3 Soil Microbiology: This course is designed to investigate the effects of soil environments on microbial occurrence; importance of organic matter transformations, discharged nutrients, and environmental quality; and management of soil microorganisms in varied ecosystems.

PS 441 3-0-3 Introduction to Plant Pathology: This course will cover the basic concepts and principles of Plant Pathology. Students will study microorganisms that induce plant diseases, mechanisms and environmental conditions that stimulate plant disease, interactions between the disease-causing agents and methods of preventing, managing, or alleviating the damage of plant disease. Students will acquire an understanding of the perspectives and problem-solving processes used by Plant Pathologists.

PS 446 2-2-3 Soil Morphology and Classification: This course details principles, practices and applications of soil morphology such as: soil body and its development, site description and interpretation; The importance and application soil classification coupled with procedures in soil classification, special emphasis on soil classification systems and recent advances in soil classification; soil genesis and standard techniques to study soil profiles are covered.

PS 447 2-2-3 Forage Crops: This course focuses on major aspects of forage crop production, for example, selection, culture, handling, and preservation of forage crops, their relations to the livestock industry and maintenance of soil fertility. The course especially emphasizes characteristics of important grasses and legumes. Special attention will be given to hay and pasture problems in the South.

PS 448 3-0-3 Soil Management: Study principles of soil management under managed agricultural systems. Relationships of soil and climate resources to soil erosion, movement and storage of soil water, soil organic matter, and irrigation practice. Special problem topics such as acidity, alkali, drainage, and soil testing. The course is designed to acquaint the student with good soil management practices and soil analysis. Also, application of fundamental soil science principles in sustainable management of agricultural, forested, and urban ecosystems.

PS 449 2-2-3 Vegetable Production: This course is an introduction to vegetable crops and the theoretical knowledge and hands-on experience required for successfully producing them. This course is designed to demonstrate the practices and problems involved in production of the important fresh marketed and processed vegetable crops and provide the student with an applicable knowledge of successful vegetable production including the what, where, when and how of growing specific crops. Topics will include crop classification; planting methods; crop climatic conditions; physiological growth; and development; and pest management; organic production; cover cropping; crop rotation; postharvest handling/management and marketing. Field trips to areas devoted to commercial production constitute a part of the course.

PS 457 3-0-3 Forest Management: This course discussed the long-term ecological outcomes of forest management activities, and management with ecological implications which assesses the combined effects of management plans. Concepts of sustainability, the quantification and projection of ecological and wildlife outcomes from implementing forest management plans, and approaches to comprehensive analysis of multiple goals are also discussed in detail. The main focus of this course is to focus on the developing of analytical, quantitative ways of thinking about forest resource management problems. This course aids in the developments of decision makers and stakeholders comprehensive, quantitative estimates of the consequences of implementing alternative management or policy scenarios.

PS 458 3-0-3 GIS Applications in Natural Resources: The course emphasizes the application of geographic information systems (GIS) and techniques of remote sensing in natural resource management. It provides students with methods in acquisition, processing, and interpretation of the primary data derived from various sensors on a practical level.

PS 459 2-2-3 Soil Fertility: This course provides a comprehensive overview of the principles of soil fertility, plant nutrition, and nutrient management. Study soil conditions affecting availability of plant nutrients; function and movement of nutrients in plants, methods of determining nutrient levels in plants, soils, and other growing media. The course is focused on understanding nutrient cycling and nutrient behavior in soils, the essential plant nutrients and the role and function of nutrients in plants. Also, understand relationships between fertilizers, soils, and plant productivity and how these components dynamically interact to influence environmental quality.

PS 460 3-3-3 Watershed Hydrology: The objective of the course is to provide the student with an understanding of the concepts and practices in hydrology and watershed management. Concepts include the importance of the water budget, water flow and stream flow analyses, watershed hydrology, erosion and sedimentation, fluvial processes, water quality and corresponding environmental issues. This course will focus on watershed case studies, management practices, implications for socio-economics environmental policy, and decision-making.

PS 467 2-2-3 Forest Soil: This course explores the environmental influence on soil formation with greater emphasis on soil properties in a forest eco-system; Incorporates the importance on the morphological, physical, and chemical soil properties affecting tree growth and forest productivity and evaluation of soils.

PS 475 2-2-3 Plant Breeding: This course will serve as a general introduction to the principles of plant breeding and biotechnology. Principles, techniques, and practices in breeding improved varieties of crop plants. The course will examine concepts significant to students in plant breeding, genetics, biotechnology, crop sciences, and allied fields of plant pathology. The course content will present a comprehensive range of applicable information relating to modification and improvement of a wide range of crops, including both agronomic and horticultural crop species.

PS 478 1-0-1 Seminar Agriculture: A review and discussion of current topics in Crop Production and Soil Management. Students will report on and discuss recent literature and current investigations relative to the Crop Production and Soil Management and preparation of reports on selected topics.

PS 479 2-2-3 Special Problems in Plant and Soil Science: The student will select a problem of his/her major interest in crops or soils and solve it under the supervision of the instructor in the particular area. Emphasis on a selected topic within the student's area of interest. Choice of topic, must be made in consultation with the instructor prior to registration. A written report and an oral presentation of the topic studied may be required.

PS 480 3-0-3 Soil Chemistry: Study of chemical and mineralogical properties of soil components. Fundamental chemical properties of soils; nature and properties of soil colloids. Structures of soil minerals as a means of understanding properties, such as ion exchange and equilibria; release and supply of nutrient and toxic materials; and soil acidity and alkalinity. Also, theory and practice of soil chemical analyses commonly encountered in research and industrial settings.

PS 482 1-4-3 Weed Control: An introduction to the principles of weeds, weed control, and herbicides. This exploratory course in pest management and introduces the students to the weed concept and factors responsible for weed survival. It is meant to provide students with both theoretical and practical knowledge in weed control as a major component of Integrated Pest Management. The course focuses on principles of weed management, general methods of weed control including preventive, cultural, mechanical, biological, chemical, and biotechnological approach to weed management. Classification and chemistry of herbicides, their residual effects on the environment, methods of herbicide use, and safety precautions, and herbicide formulations.

PS 483 2-2-3 Environmental Science: This course presents the most current and relevant environmental science issues, research to identify and analyze, alternative solutions for resolving and/or preventing both natural and human-made environmental problems. This course focuses on the sequential activities of human activities by examining the quantifiable parameters such as the greenhouse gases, climate change, loss of agricultural land to erosion, the urban environment, and problems of population growth while expanding on sustainability and stewardship.

PS 484 1-4-3 Greenhouse Crops: The principles of greenhouse management including production and management problems of potted plants. This course offers an introduction to manipulating the greenhouse environment to grow plants. Coursework includes the identification of and specific requirements for growing plants commonly grown in greenhouses and shade structures.

PS 490 3-0-3 Research Methods: Students will learn the basic principles of the scientific method. Emphasis will be placed on techniques used in identifying problems, forming hypotheses, constructing and using data-gathering instruments, designing research studies, and employing statistical procedures to analyze data.

PS 492 2-3-3 Microclimatology: This course is designed to address the principles of energy exchange and their application to near surface environments. Lectures will concentrate on problems in agriculture, forestry, hydrology and urban systems; physical mechanisms of flows of mass and energy between the atmosphere and the earth surface.

PS 493 1-4-3 Soil Physics: This course is designed to provide knowledge on soil physical properties and processes. It provides; a working knowledge of the methods and instrumentation used in evaluating soil physical properties, knowledge of the effects of soil physical conditions on plant growth and understanding of how soil physical processes may influence environmental quality. The course will explore the interaction of physical, chemical, and biological processes and properties of soils which influence the optimum growth of plants as well as the potential for groundwater and surface water contamination from agrochemicals. Emphasis will be given to basic concepts of transport and retention for water and solutes, and air and heat flow in the root zone of the soil profile.

PS 495 3-0-3 Experimental Design: Designed to explore the fundamental principles of experimental designs especially in relation to computation and analyses of biological research data. This course focuses on methodological and design issues in planning an experiment and analyzing the data with various statistics.

PS 497 3-0-3 Agricultural and Environmental Law: This course addresses chief issues and concerns of agricultural law, key concepts and principles relating to how the law has dealt and deals with agriculture. Emphasis will be placed on the U.S. legal system-major legal and regulatory development; common marketplace problems and their solutions.