

Descriptions — Food Science and Human Nutrition

of

Courses

490C. Professional Literature II: Clinical Nutrition

Spring. 2(2-0) HNF 290, HNF 470 or concurrently or approval of department.

Selected topics in clinical nutrition research. Emphasis on human investigative data and scientific principles related to nutritional care of patients/clients including pathophysiologic correlations, nutritional assessment, diet planning, nutrition counseling.

490D. Professional Literature II: Foodservice Management

Winter. 2(2-0) HNF 290, HNF 441 or approval of department.

Examination of trends, problems and research in food service systems operation. Focus on current issues and developments relating to materials handling, labor needs, operational accountability and public responsibility.

490E. Professional Literature II: Foods and Nutrition Information

Spring. 2(2-0) HNF 290, HNF 411 or HNF 462 or approval of department.

Selected topics in foods and nutrition information. Emphasis on research related to method and effectiveness of nutrition education.

495. Independent Study

Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. Seniors; approval of department.

Individual study of selected topics in foods, nutrition and food service management under staff guidance.

498. Field Study

Fall, Winter, Spring, Summer. 3 to 12 credits. May reenroll for a maximum of 12 credits. Approval of department.

Planned program of research, observation, study or work in selected organizations under staff guidance.

800. Seminar in Foods and Nutrition

Fall, Winter, Spring. 1(1-0) HNF 403 or HNF 463.

802. Seminar in Food Service Management

Spring. 2 to 4 credits. May reenroll for a maximum of 4 credits. Approval of department.

805. Experimental Foods III

Spring. 4(1-9) HNF 404 or approval of department.

Planning, executing, and reporting individual research project. Data collection, evaluation and interpretation to demonstrate understanding of research techniques and attitudes, and an awareness of significant problems in the field.

813A. Supervised Individual Study in Nutrition

Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 10 credits. HNF 461.

813B. Supervised Individual Study in Experimental Foods

Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 10 credits. Approval of department.

813C. Supervised Individual Study in Foodservice Management

Fall, Winter, Spring, Summer. 2 to 4 credits. May reenroll for a maximum of 10 credits. Approval of department.

Special studies in facility management, personnel coordination and tools and methods of operational control.

816. Applied Human Nutrition

Spring. 3(3-0) HNF 462.

840. Topics in Nutrition

Fall, Winter, Spring, Summer. 2 to 3 credits. HNF 462, PSL 432, BCH 401.

Advanced studies in nutrition: assessment and surveillance, community, clinical, growth and development, behavior, infectious disease and environment, oral health, obesity, aging, diet.

841. Nutrition and Obesity

Winter of even-numbered years. 2(2-0) One undergraduate course in nutrition, biochemistry or physiology.

Assessment, energy metabolism, and risk factors associated with obesity. Significance of nutrition and other factors for weight control and reduction.

842. Nutritional Counseling

Fall of odd-numbered years. 3(2-3) HNF 470 or approval of department.

Provision of nutritional counseling for clients. Assessment, planning, implementation and evaluation of nutritional counseling.

899. Master's Thesis Research

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

921. Pathology of Nutritional and Metabolic Diseases

(HNF 921, LSM 921.) Spring of odd-numbered years. 4(3-2) ANT 420, ANS 525, BCH 452, HNF 462 recommended. Interdepartmental with and administered by the Department of Large Animal Clinical Sciences.

Development, physiopathology and morphologic pathology of nutritional and metabolic diseases including carbohydrate, protein, fatty acid, vitamin and mineral deficiencies, their experimental induction and their medical or economic significance.

935. Comparative Nutrition—Lipids and Carbohydrates

(926.) Winter of odd-numbered years. 4(4-0) BCH 452 and a previous course on principles of nutrition. Interdepartmental with the Department of Animal Science.

Regulatory aspects of carbohydrate and lipid metabolism as influenced by nutrition in mammals. Emphasis on normal and abnormal physiological states such as obesity, ketosis and diabetes.

936. Comparative Nutrition—Protein Metabolism and Developmental Biology

(927.) Winter of even-numbered years. 4(4-0) BCH 453, PSL 803 or approval of department. Interdepartmental with and administered by the Department of Animal Science.

Protein quality assessment, protein status, protein calorie malnutrition, amino acid metabolism, protein turnover, digestion and absorption, hormonal control of protein metabolism, developmental aspects of protein metabolism and growth.

937. Comparative Nutrition—Minerals

(A H 928.) Spring of even-numbered years. 3 credits. BCH 452, PSL 802. Interdepartmental with and administered by the Department of Animal Science.

Forms and location in body, metabolic roles, deficiency and toxicity signs, interrelationships, requirements and biological availability of sources.

938. Comparative Nutrition—Vitamins

(A H 929.) Spring of odd-numbered years. 3(3-0) BCH 452 and a previous course on principles of nutrition. Interdepartmental with the Department of Animal Science.

Chemical and physical properties, standards of activity, occurrence, metabolic roles, antivitamins, deficiency and toxicity signs, requirements and factors affecting requirements.

999. Doctoral Dissertation Research

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

FOOD SYSTEMS ECONOMICS AND MANAGEMENT

See Agricultural Economics.

FOREIGN LANGUAGES

See Linguistics and Germanic, Slavic, Asian and African Languages, and Romance and Classical Languages.

FORESTRY

FOR

College of Agriculture and Natural Resources

In 305, 306, 402 and 430, field trips are scheduled for several consecutive days away from the campus for integrated field experience, primarily in the second half of spring term of the junior year, so that these courses must be taken concurrently. This precludes enrollment in other courses during that term. The approximate cost of these field trips is \$200.

202. Introduction to Forestry

Fall, Spring. 3(3-0)

Forestry in its broadest sense, including: historic development, forest growth, protection and management, products, national and world economy and policy. Emphasis on multiple use concepts. One-day field trip required.

203. Resource Ecology

(IDC 200.) Fall, Winter, Spring, Summer. 3(3-0) Interdepartmental with the departments of Fisheries and Wildlife, Geography, Resource Development, and Zoology. Administered by the Department of Fisheries and Wildlife.

Basic concepts of ecology which are the unifying basis for resource management, conservation policy and the analysis of environmental quality. Extensive use of guest lecturers.

- 204. Forest Vegetation**
Fall, Spring, 5(3-4)
Nomenclature, classification, and identification of important trees, shrubs, and herbaceous plants of forest and field.
- 220. Plants and Their Environment**
Winter, 3(3-0) Interdepartmental with Agriculture and Natural Resources.
Relationships between plants and fundamental climatic, edaphic, and biotic factors; structure and function of different ecosystems in relation to environmental factors.
- 301. Quantitative Methods for Natural Resources**
Winter, 4(3-2) MTH 109 or MTH 111.
Collection and analysis of information pertaining to natural resources. Survey design, field procedures, equipment, and analytical techniques.
- 304. Forest Ecology**
Fall, 4(3-3) FOR 204; BOT 205; CSS 210 or concurrently.
The forest is viewed as a biological community. Forest site relationships are quantified by examining the existing physical environment and relating it to the forest species occupying that community.
- 305. Silviculture**
Spring, 4(3-3) FOR 204, FOR 304, FOR 402, FOR 424, FOR 425, FOR 429 concurrently.
Natural and artificial forest reproduction methods; intermediate stand treatments; nontimber aspects of silviculture; field studies of silvicultural methods. Extended field trips required.
- 306. Forest Fire Protection and Use**
Winter of odd-numbered years, 3(2-3) Juniors or approval of department.
Causes and effects of forest fires. Combustion, fire behavior and fire weather. Prevention and control planning and techniques. Fire in forest land management.
- 309. Wood Technology**
Fall, 4(3-3)
Structure of wood. Mechanical and physical properties of wood. Wood anatomy and relation to growth.
- 310. Wood Structure and Properties**
Spring, 3(2-2) Not open to students with credits in FOR 309.
Properties and characteristics of solid wood, plywood, particleboard and hardboard with emphasis on their use in packaging. Laboratory is concerned with wood identification and strength testing.
- 402. Forest Inventory**
Spring, 4(2-4) FOR 301, FOR 305, FOR 424, FOR 425, FOR 429 concurrently.
Field and office techniques of forest inventory, with primary emphasis on timber resources. Extended field trips required.
- 409. Forest Hydrology**
Winter, 3(3-0) FOR 424, Seniors; or approval of department.
Hydrologic cycle, with emphasis on soil, water and ground water regimes; instrumentation and measurement of the various components. Effects of forest management on watersheds and water yields.
- 410. Forest Tree Improvement**
Fall, 3(2-2)
Distribution of genetic variation in natural tree populations. Introduction, selection, progeny testing, species hybridization, and polyploidy to obtain superior tree populations.
- 411. Tree Physiology**
Winter, 3(3-0) BOT 301.
The fundamental principles of plant physiology with particular reference to the growth and development of woody plants, and consideration of the influence of genetic and environmental factors on physiological processes in trees.
- 424. Forest Soils**
Spring, 3(2-3) CSS 210; Juniors or approval of department. Forestry majors: FOR 305, FOR 402, FOR 425, FOR 429 concurrently. Interdepartmental with the Department of Crop and Soil Sciences.
Interrelationships of forest site and the growth of trees. Properties, classification, inventory, productivity and management of forest soils. Effects of silvicultural and forest management practices on the soil.
- 425. Forest Soils Laboratory**
Spring, 1(0-3) CSS 210; FOR 305, FOR 402, FOR 424, FOR 429 concurrently. Interdepartmental with the Department of Crop and Soil Sciences.
Exercises and field trips relating to properties, classification, inventory, productivity and management of forest soils. Extended field trips required.
- 428. Seminar**
Fall, 1(1-0) Seniors.
Current forestry topics.
- 429. Timber Harvesting**
Spring, 3(2-3) FOR 309, FOR 305, FOR 402, FOR 424, FOR 425 concurrently.
Felling, bucking and transport of trees to mill site. Capabilities and limitations of mechanical devices, vehicles, and logging systems related to timber size and terrain. Extended field trips required.
- 430. Industrial Timber Utilization Processes**
Winter, 3(2-2) FOR 429.
Mechanics and technologies of industrial wood conversion processes, including grading logs and lumber, manufacture of furniture, plywood, particleboard, fiberboard, and paper. Field trips required.
- 431. Finishing, Preservation and Drying of Wood**
Winter, 3(3-0) FOR 309.
Properties, selection, application of decorative and protective coatings, wood preservatives and fire retardants. Air and kiln drying of lumber.
- 435. Law and Resources**
Fall, 3(3-0) R D 417 or GBL 430. Interdepartmental with and administered by the Department of Resource Development.
Legal theories, cases, statutes and constitutional considerations are applied to natural resource utilization. Private and public property interests in natural resources are illustrated through case studies of use conflicts.
- 446. Range Management**
Winter of even-numbered years, 4(4-0) FOR 220 or FOR 304 or approval of department.
The science of range management, with emphasis on range regions, range vegetation management, livestock management practices, range improvements and multiple use values of rangelands.
- 450. Natural Resource Administration**
Winter, 4(4-0) Seniors; not open to forestry majors. Interdepartmental with Agriculture and Natural Resources and the departments of Fisheries and Wildlife, Park and Recreation Resources, and Resource Development.
Concepts and methods of administering wildland properties. The legal, economic and social environment. Benefit-cost analysis of management changes. Unit organization, personnel management and accounting. Presents a systems view of administration.
- 454. Forestry in International Development**
Winter, 3(3-0)
Assessment of the world's forest resources, forest products industrial development and trade, and restraints of developmental objectives on forestry goals. Issues, policy approaches, and prospects for individual countries.
- 455. Natural Resource Economics**
Fall, 4(4-0) Approval of department. Interdepartmental with Agriculture and Natural Resources and the departments of Fisheries and Wildlife, Park and Recreation Resources, and Resource Development.
Basic economic and political principles and techniques that govern the production and consumption of forest land products, including basic forest valuation procedures.
- 457. Forest Management I**
Fall, 3(2-2) FOR 305.
Managing the timber compartment. Timber management systems, compartment examination, silvicultural prescription, yield projection and economic evaluation.
- 459. Forest Management II**
Winter, 3(2-2) FOR 457.
Managing the forest property. Organization of forest properties, timber yield regulation, multiple-use planning, and administering management operations.
- 460. Arboriculture**
Fall, 3(2-2) Approval of department.
Principles and techniques of species selection, establishment, and cultural practices used in the care and maintenance of shade and ornamental trees. Two-day field trip required.
- 461. Urban Forestry**
Spring, 3(3-0) FOR 460 or approval of department.
Principles of urban forest management: organizational, legal, economic, cultural and environmental. Inventories, utility forestry and commercial arboriculture. Field trips required.
- 465. Forest and Wood Science Problems**
Fall, Winter, Spring, Summer, 1 to 5 credits. Seniors with a 2.80 average, or approval of department.
Special problems course for students qualified for advanced study in some phase of forestry or wood science.

Descriptions — Forestry

of

Courses

- 491. Natural Resources and Modern Society**
Spring. 3(3-0) Juniors. Interdepartmental with Agriculture and Natural Resources and the Department of Resource Development.
A survey of the social and economic significance of natural resources in modern industrial and urban society. Current problems of natural resources management and use are examined in terms of the society in which they exist.
- 804. Forest Ecology**
Winter. 3(3-0) Approval of department.
Theories, methods of analysis, and discussion of current investigations of energy, nutrients, and biomass dynamics in forest ecosystems.
- 807. Special Problems**
Fall, Winter, Spring, Summer. 2 to 5 credits. May reenroll for credit with a maximum of 10 credits. Approval of department.
Advanced study in administration, biometrics, photogrammetry, dendrology, silviculture, management, economics, ecology, genetics, arboriculture, hydrology, soils, recreation, physiology, policy, entomology, products harvesting, wood preservation, timber mechanics, wood conversion, fire, range management, extension and pathology.
- 809. Natural Resources Economics**
Winter. 3(3-0) Approval of department. Interdepartmental with the Department of Resource Development.
Applications of economic analysis to natural resource problems.
- 814. Plant Breeding and Genetics Seminar**
Winter. 1(1-0) May reenroll for a maximum of 2 credits. Approval of department. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Crop and Soil Sciences.
- 815. Selected Topics in Plant Breeding and Genetics**
Fall, Winter, Spring, Summer. 2 to 5 credits. May reenroll for a maximum of 12 credits if different topics are taken. Approval of department. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Crop and Soil Sciences.
Selected topics in plant breeding including: host-plant resistance, nutrition and quality, computerized records and data analysis, classical literature and strategies for improving field, horticulture and forestry crops.
- 816. Special Problems in Plant Breeding and Genetics**
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 8 credits. Approval of department. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Horticulture.
Students may conduct research in a laboratory, greenhouse or field-plot on a selected subject or study selected published literature under the supervision of a faculty member.
- 821. Genetic Concepts in Plant Breeding**
Fall. 3(3-0) CSS 250 or ZOL 441. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Crop and Soil Sciences.
Genetic structure of plant populations, gene action, inbreeding, outbreeding, heterosis, linkage and recombination, genetic architecture of traits, genetic distance.
- 822. Plant Breeding Systems**
Winter. 3(3-0) CSS 821, STT 422. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Horticulture.
Breeding systems for improvement of self and cross pollinated and of vegetatively propagated crops. The genetic basis for parent selection.
- 823. Plant Breeding Methods**
Spring. 3(3-0) HRT 822, STT 423. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Crop and Soil Sciences.
Methods, strategies and practices in organization and operation of plant breeding programs. Emphasis on practical application of classical, modern and futuristic approaches to plant breeding.
- 828. Seminar**
Fall. 1(1-0)
Critical study and discussion of advanced forestry topics.
- 835. Silviculture**
Fall. 3(3-0) FOR 305 or approval of department.
Biological basis of intensive forest management including seedling production, site evaluation and preparation, plantation establishment, intermediate stand treatments and natural reproduction methods. Field trip optional.
- 836. Evolution of Crop Plants**
Spring of odd-numbered years. 3(3-0) CSS 821 or approval of department. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Horticulture.
Cultural and biological aspects of evolution under domestication; origin and diversity of cultivated plants.
- 838. Tissue Culture for Plant Breeding**
Winter of even-numbered years. 3(2-2) BOT 414, CSS 821. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Horticulture.
The application of plant cell, protoplast and tissue culture methodologies and principles to crop improvement.
- 840. Recreation Economics**
Spring. 4(4-0) FOR 809 or approval of instructor. Interdepartmental with the departments of Park and Recreation Resources, and Resource Development. Administered by the Department of Park and Recreation Resources.
Applications of economic analysis to recreation resource problems including measurement of demand and supply, valuation of recreation resources, determination of economic impact, economic decision making and policy considerations.
- 844. Plant Organelle Genetics**
Winter of odd-numbered years. 3(3-0) Approval of department. Interdepartmental with Genetics and the departments of Botany and Plant Pathology, Crop and Soil Sciences, and Horticulture. Administered by the Department of Horticulture.
Organization, structure, function, heredity, molecular biology and manipulation of chloroplasts and mitochondria. Biological interactions between the nucleus and organelles.
- 845. Forest Policy**
Fall. 3(3-0) Approval of department.
The dynamics and process of forest policy making.
- 850. Administering the Public Land Agency**
Spring. 4(4-0) FOR 450 or approval of department.
Case studies of administrative problems in land management agencies. Students are organized as teams and prepare team reports on specified aspects of each case.
- 855. The Research Process in Natural Resources**
Fall. 3(3-0) Approval of department. Interdepartmental with and administered by the Department of Resource Development.
Research and decision processes as applied in natural resource investigations. Research organization and applications of research results. Oriented to management, social science, and policy studies. Preparation of project proposals.
- 899. Master's Thesis Research**
Fall, Winter, Spring, Summer. Variable credit. Approval of department.
- 910. Resource Economics Proseminar**
Spring. 3(3-0) May reenroll for a maximum of 9 credits. Approval of department. Interdepartmental with the departments of Agricultural Economics and Resource Development.
A seminar wherein advanced graduate students in the fields of resource economics participate with faculty in the joint conduct of a major research project in resource economics and policy.
- 940. Theoretical Population Genetics**
Winter of even-numbered years. 4(4-0) MTH 113, STT 422, CSS 821. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture.
Discussion of mathematical theories in population genetics and experimental works on natural and laboratory populations.
- 941. Quantitative Genetics in Plant Breeding**
Spring of even-numbered years. 4(4-0) STT 423, CSS 823 or approval of department. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Crop and Soil Sciences.
Calculation and implication of genetic parameters. Linkage. Coancestry and inbreeding. Covariance between relatives. Heritability and selection. Genotype by environment interaction. Emphasis on relationship of quantitative genetics to plant breeding.
- 944. Physiological Genetics**
(830.) Winter. 3(3-0) BOT 413; CSS 821. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture.
Control of variation in higher plants including adaptive physiology, quantitative genetics, growth correlation, biochemical genetics, hybrid physiology, and geneecology.
- 960. Simulation Models in Natural Resource Management**
Winter of odd-numbered years. 3(3-0) R D 855 and knowledge of FORTRAN programming or approval of department. Interdepartmental with and administered by the Department of Resource Development.
The role of simulation models in developing management strategies. Applications of computer simulation in natural resources. Modeling of decision systems in natural resources management.

976. **Multivariate Methods in Forestry Research**
Winter of even-numbered years. 4(4-0)
MTH 334, STT 423, CPS 120.

Application of multivariate techniques such as principal components, canonical analysis, factor analysis, and clustering to problems in forestry research. Case studies drawn from several forestry disciplines.

999. **Doctoral Dissertation Research**
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

FRENCH

See Romance and Classical Languages.

GENERAL BUSINESS— AND BUSINESS LAW GBL

(Name change effective July 1, 1984. Formerly the Department of Business Law and Office Administration.)

College of Business and Graduate School of Business Administration

341. **Survey of Business Law**
(BOA 341.) Fall, Winter, Spring. 4(4-0) Juniors. Not open to students with majors in the College of Business.

Historical development of the law; courts, court procedures and civil remedies, torts, crimes; contracts, agency, sales, negotiable instruments, real and personal property, including bailments and liens. Textbook and lecture rather than case approach.

345. **Business Ethics**
Fall. 4(4-0) Juniors. Interdepartmental with and administered by the Department of Philosophy.

Ethical dimensions of the relationships between a business and employees, consumers, other businesses, society, government, and the law. Readings from philosophical and business sources.

400H. **Honors Work**
(BOA 400H.) Fall, Winter, Spring, Summer. 1 to 15 credits. Approval of department.

Independent and informal study in law, office administration or business communications.

430. **Law and Society**
(BOA 440., 440.) Fall, Winter, Spring, Summer. 4(4-0) Seniors or approval of instructor; may not earn credit in both GBL 430 and GBL 441.

Legal reasoning and legal institutions. Court systems and court procedures. Contracts and sales. Sources of and limits on legislative and judicial authority. Property, torts, and crimes.

431. **Law and Business**
Fall, Winter, Spring, Summer. 4(4-0) GBL 430.

Law of business associations, administrative agencies and process, the constitution and the business enterprise, liability to consumers, securities, regulation of business conduct and structure, business ethics and social responsibility.

441. **Contracts and Sales**
(BOA 441.) Fall, Winter, Spring, Summer. 3(3-0) Seniors or approval of instructor; may not earn credit in both GBL 430 and GBL 441.

Contracts, including concept of freedom of contract and limitations. Sales. Case study method.

442. **Agency, Partnerships and Corporations**
(BOA 442.) Winter, Spring. 3(3-0) GBL 441.

The law dealing with agency and business organizations. Case study method.

443. **Negotiable Instruments, Secured Transactions, Property**
(BOA 443.) Winter, Spring. 3(3-0) GBL 441.

The law of negotiable instruments, secured transactions, and property. Case study method.

447. **Hotel Law**
(BOA 447.) Winter, Spring. 4(4-0) GBL 440.

Legal aspects of the hospitality industry.

468. **Field Studies**
(BOA 468.) Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 8 credits. Approval of department.

Planned program of observation and work in selected business firms. Analysis and reports.

805. **Business Ethics**
Spring. 4(4-0) Graduate student in the College of Business or approval of instructor. Interdepartmental with and administered by the Department of Philosophy.

Ethical dimensions of such topics as corporate responsibility, preferential hiring, profit and taxation, deception and bribery, self-regulation versus government regulation, 'whistleblowing', and advertising. Readings from philosophical and business sources.

848. **The Legal Environment of Business**
(BOA 848.) Fall, Summer. 4(4-0)

Critical examination of the environment in which business operates. Analysis of the component elements of the legal environment of business and the structural framework in which law functions.

878A. **Seminar in Business Law**
(BOA 878A.) Winter. 4(4-0) GBL 848 or approval of department.

Contracts, sales, secured transactions and consumer legislation viewed from the judicial, legislative and executive vantage points.

878B. **Seminar in Business Law**
(BOA 878B.) Spring. 4(4-0) GBL 848 or approval of department.

Agency, partnerships and corporations, viewed from legislative, judicial and executive vantage points, as they affect entrepreneurial decision making.

890. **Special Problems**
(BOA 890.) Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 8 credits. Approval of department.

GENETICS GEN

College of Natural Science

800. **Genetics Seminar**
Fall, Winter, Spring. 1(1-0) May reenroll for a maximum of 12 credits. Approval of director.

Student seminar to cover genetics subjects not considered in formal courses. Course is also intended to give students experience in reviewing and organizing literature in a subject, and orally presenting and defending the analysis.

804. **Gene Transmission**
Fall. 3(3-0) ZOL 441 or approval of instructor.

Molecular and formal genetic studies of the replication, recombination, repair and segregation of genetic information in prokaryotes and eukaryotes. Experimental design and methodology will be emphasized.

805. **Genetic Organization, Action and Regulation**
Winter. 3(3-0) GEN 804.

Molecular and formal genetic studies of the organization, expression and regulation of gene activity in prokaryotes and eukaryotes. Experimental design and methodology will be emphasized.

806. **Population and Quantitative Genetics**
Spring. 3(3-0) ZOL 441 or approval of instructor.

Genetics of quantitative characteristics in populations with special reference to polygenic variation and its interactions with environment, gene action and its measurement, mating systems, and selection.

844. **Plant Organelle Genetics**
Winter of odd-numbered years. 3(3-0) Approval of department. Interdepartmental with the departments of Botany and Plant Pathology, Crop and Soil Sciences, Forestry, and Horticulture. Administered by the Department of Horticulture.

Organization, structure, function, heredity, molecular biology and manipulation of chloroplasts and mitochondria. Biological interactions between the nucleus and organelles.

856. **Plant Genetics and Molecular Biology**
Spring of even-numbered years. 3(3-0)

Approval of department and a course in introductory genetics. Interdepartmental with the departments of Biochemistry, and Botany and Plant Pathology. Administered by the Department of Botany and Plant Pathology.

Recent advances in genetics and molecular biology of higher plants.

880. **Special Problems**
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 12 credits. Approval of instructor.

Students with special interests and abilities may study published literature in a selected genetics topic or they may carry on research in the laboratory on a selected subject in collaboration with genetics faculty.

890. **Selected Topics in Genetics**
Fall, Winter, Spring, Summer. 2 to 5 credits. May reenroll for a maximum of 9 credits. ZOL 441 and approval of instructor.

Topics will be selected from molecular genetics, physiological genetics, population genetics, quantitative genetics, evolution, radiology and mutagenesis, microbial genetics, somatic cell genetics, behavioral genetics, and human genetics.