

AGRICULTURE (AGR) 502

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General Department Information

HONORS IN AGRICULTURE

Departmental Honors in Agriculture is available to qualified juniors and seniors. The student completing the Honors Program graduation requirements will graduate “with Honors in Agriculture,” which will be indicated on the student’s official transcript and diploma. Admission to the Honors Program in Agriculture requires a minimum of sixty (60) semester hours of post-secondary courses with a cumulative grade point average of 3.50 or higher on a 4.00 scale. In order to graduate as an Honors Graduate in Agriculture, a student must fulfill the general requirements for participation in the University Honors Program. Students must also have a cumulative grade point average of 3.50 or higher; a cumulative grade point of 3.70 or higher for all courses taken in the Department of Agriculture; successfully completed two in-course honors in 200-level or higher courses in the student’s technical area; successfully completed one in-course honors course in a 200-level or higher course offered outside the Department of Agriculture; and successfully completed a minimum of three credit hours of AGR 299, Independent Study. The Department of Agriculture offers in-course honors work in all its courses for students enrolled in the University Honors Program or in any departmental honors program. In-course work is offered at the discretion of the instructor.

Further details about the University Honors program are available at Honors.IllinoisState.edu.

Agriculture Program

Degree Offered: B.S.

MAJOR IN AGRICULTURE

Agribusiness Sequence

—36 hours in Agriculture and 19 hours in the College of Business and/or Depart-

ment of Economics.

- Required courses (21-22 hours): ACC 131; AGR 109, 110; CHE 110 and 112, or 140; ECO 105; MAT 120.
- Choose four courses (12-14 hours) from: AGR 120, 130, 150, 157, 170, 205.
- The student must complete a minimum of 12 semester hours (within the 36 required in Agriculture) in Agribusiness courses selected from AGR 213, 214, 215, 216, 310, 311, 312, 313, 314, 315, 317, 318, 319, 320, 324.
- AGR 295, 394, and 395 do not count toward this major.
- Non-business majors who desire to elect more than 30 hours of their coursework in business must meet all College of Business requirements for graduation. These students should register for additional courses only in person and with the written permission of the College of Business advisor.

Agriculture Communication and Leadership Sequence

- 37 hours in Agriculture and 18 hours in Communication required.
- Required Agriculture courses (25 hours): AGR 109, 110, 120, 130, 150, 170, 190, 192, 205.
- 3 hours from AGR 295 or 398.
- 3 hours from: AGR 319; EAF 228, 231, 235; or TCH 212.
- Additional required courses (6 hours): COM 111 and 297.

Agronomy Management Sequence

- 55 hours in Agriculture required.
- Required Agriculture courses (34 hours): AGR 109, 110, 120, 150, 157, 203, 234, 272, 305, 357.
- 6 hours of Agronomy electives.
- 12 hours of senior level Agribusiness courses.
- 3 hours of a senior level Horticulture course.

Animal Industry Management Sequence

- 55 hours in Agriculture required.
- Required Agriculture courses (32-33 hours): AGR 109, 170, 173, 272, 275, 282, 283, 286; combination of AGR 380

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and one from 381A01 or 381A02 or 381A03 or 398 (2 hours); and choose one from AGR 110, 120, 130, 150 or 157.

- 8 hours of Animal Science electives.
- 15 hours of Agribusiness electives.
- Additional required courses (6-12 hours): BSC 101 or 196 or 197; CHE 102, or 110 and 112, or 140 and 141.

Animal Science Sequence

- 36 hours in Agriculture required.
- Required Agriculture courses (32-33 hours): AGR 109, 170, 173A01 or 173A02, 272, 275, 282, 283, 286; combination of AGR 380 and one from 381A01 or 381A02 or 381A03 or 398 (2 hours); and choose one from AGR 110, 120, 130, 150, or 157.
- 4 hours of Animal Science electives.
- Additional required courses (20-24 hours): BSC 196 or 197; CHE 110 and 112, or 140 and 141; CHE 220 or 230 and 231; and CHE 242 or 342; MAT 120 or 144 or 145.

Crop and Soil Science Sequence

- A minimum of 61 hours required.
- 37 hours in Agriculture required.
- Required Agriculture courses (34 hours): AGR 109, 110, 120, 150, 157, 203, 234, 272, 305, 357.
- 3 hours of senior level Agronomy electives.
- Required courses outside of Agriculture (24-27 hours): CHE 110 and 112, or 140 and 141; CHE 220 and 242; GEO 102; MAT 120 or 144 or 145; PHY 105.

Food Industry Management Sequence

- 36 hours in Agriculture and/or Family and Consumer Sciences and 19 hours in the College of Business and/or Department of Economics.
- Required courses (42-43 hours): ACC 131; AGR 109, 110, 271, 315, 317; AGR 205 or IT 150; CHE 110 and 112, or 140; ECO 105; ECO 138 or MQM 100; FIL 185; MKT 230; MAT 120.
- Choose one course (3-4 hours) from: AGR 120, 130, 150, 170.
- 15 hours from AGR 214, 215, 257, 285, 314, 319, 324, 340; FCS 102, 113, 213, 316, 319, 332.
- AGR 295, 394, and 395 do not count toward this sequence.

Horticulture and Landscape Management Sequence

- 36 hours in Agriculture and 19 hours in the College of Business and/or Department of Economics.
- Required courses (38-39 hours): ACC 131; AGR 109, 110, 120, 130, 157; AGR 150 or BSC 196 or 197 (AGR 150 preferred); CHE 110 and 112, or 140; ECO 105; FIL 185; MAT 120.
- 12 hours from AGR 252, 253, 254, 255, 256, 257, 260, 262, 352, 353, 355, 356.
- AGR 295, 394, and 395 do not count toward this sequence.

Pre-Veterinary Medicine Sequence

- 36 hours in Agriculture required.
- Required Agriculture courses (32-33 hours): AGR 109, 170, 173, 272, 275, 282, 283, 286; combination of AGR 380 and one from 381A01 or 381A02 or 381A03 or 398 (2 hours); and choose one from AGR 110, 120, 130, 150, 157.
- 4 hours of Animal Science electives.
- Additional required courses (35-37 hours): BSC 196 and 197; CHE 140, 141, 230, 231, and 242 or 342; MAT 144 or 145; PHY 108 and 109, or 110 and 111.
- A minimum of 3.00 GPA in chemistry courses must be achieved by 60 hours to remain in the Pre-Veterinarian Sequence.
- Must maintain a minimum 3.20 cumulative GPA to remain in the Pre-Veterinary Medicine Sequence.

Agriculture Teacher Education Sequence

- All Agriculture Teacher Education students planning to become licensed teachers must apply for and be admitted to the University Professional Studies program (see the University-Wide Teacher Education section of this Undergraduate Catalog). A cumulative 2.50 GPA and 2.50 GPA in the major are required for admission and retention in the sequence. Students are encouraged to consider a second licensure in an academic area such as Biological Sciences, Chemistry or Mathematics.
- 74-75 total hours required.
 - 42 hours in Agriculture required.
 - Required Agriculture courses (42 hours): AGR 109, 110, 120, 130, 150, 157, 170, 173, 190, 191, 205, 231, 295, 394, 395.

- Additional required courses (8-9 hours): BSC 196 or 197 (196 preferred); CHE 110 and 112, or 140.
- Professional Education requirements (14 hours): EAF 228 or 231 or 235; PSY 215; TCH 212, 216, and 219.
- A minimum of 100 clock hours of approved pre-student teaching clinical experiences; and Student Teaching 399A01 (10 hours). All professional education and content-area coursework required for the program must be passed with a grade of C or better. Program leads to licensure: secondary 6-12.

CLINICAL EXPERIENCES IN TEACHER EDUCATION

A variety of clinical (pre-student teaching) experiences, as well as student teaching, are included in the teacher candidates professional preparation. Observations, small and large group instruction, tutoring, field experiences, and student teaching are included in the Clinical Experiences Program. The experiences offered prior to student teaching are integral parts of specific college courses. Clinical experiences are provided in off-campus professional development schools, local schools, campus laboratory schools, agencies and other approved non-school settings. The Cecilia J. Lauby Teacher Education Center monitors and documents all clinical experiences. Teacher candidates will show verification of having completed clinical experiences commensurate with attaining local, state, and national standards. Teacher candidates must provide their own transportation to clinical experiences sites.

Candidates are required to provide documentation of meeting all State of Illinois, district, and university requirements in regard to criminal background checks BEFORE beginning any clinical experiences. Criminal background checks must remain current as of the last day of the clinical experience. Candidates should consult with clinical course faculty and the Cecilia J. Lauby Teacher Education Center well in advance of clinical experiences to determine specific requirements needed each semester.

The approximate number of clinical hours associated with each course offering can be found with the appropriate course description in this *Undergraduate Catalog*. The following

legend relates to the type and kind of activity related to a specific course.

Clinical Experiences Legend

- Observation (including field trips)
- Tutoring one-on-one contact
- Non-instructional assisting
- Small group instruction
- Whole class instruction
- Work with clinic client(s)
- Graduate practicum
- Professional meeting

MINOR IN AGRICULTURE

- 24 hours in Agriculture required.
- Required courses: AGR 109, two 100-level Agriculture courses.

Agriculture Courses

In meeting program requirements in the Department of Agriculture, the student should note that the courses are considered in areas, as follows:

- General courses:** AGR 109, 198, 201, 203, 205, 302, 303, 398.
- Agribusiness:** AGR 110, 213, 214, 215, 216, 310, 311, 312, 313, 314, 315, 317, 318, 319, 320, 324.
- Agricultural Education:** AGR 190, 295, 394, 395.
- Agricultural Engineering Technology:** AGR 130, 225, 231, 232, 234, 235, 304, 340, 383.
- Agronomy:** AGR 150, 157, 272, 304, 305, 306, 352, 355, 357, 363.
- Animal Science:** AGR 170, 173, 271, 272, 275, 280, 282, 283, 285, 286, 288, 363, 372, 375, 380, 381A01, 381A03, 386.
- Horticulture and Landscape Management:** AGR 120, 150, 157, 252, 253, 254, 255, 256, 257, 260, 262, 352, 353, 355, 356.

109 INTRODUCTION TO THE AGRICULTURAL INDUSTRY

3 sem. hrs.

Study of the agriculture programs within the department and career opportunities in agriculture.

110 INTRODUCTORY AGRICULTURAL ECONOMICS**3 sem. hrs.**

Fundamental principles of economics applied to agriculture, agriculture finance, prices, taxation, marketing, and land use.

120 INTRODUCTORY HORTICULTURE**3 sem. hrs.**

Introduction to principles and practices in development, production, and use of horticultural crops (fruits, vegetables, greenhouse, floral, turf, nursery, and landscape). Materials charge optional.

130 INTRODUCTION TO**ENGINEERING TECHNOLOGY****3 sem. hrs.**

Place of mechanics in agriculture. Examples, problems, discussions, and laboratory exercises in present and future mechanics applications. Lecture and lab. Materials charge optional.

150 PRINCIPLES OF AGRONOMY**4 sem. hrs.**

Fundamentals of plant science; importance, classification, distribution, and production practices of the major crops of the world. Lecture and lab.

157 SOIL SCIENCE**4 sem. hrs.**

Origin and formation, physical and chemical properties, moisture relationships, liming and fertilizing soils. Chemical and physical tests of soils. Lecture and lab. Materials charge optional. Prerequisite: CHE 102 or 110 or 140 or equivalent.

170 INTRODUCTION TO ANIMAL SCIENCE**3 sem. hrs.**

Breeding, selection, genetics, nutrition, physiology, and production of farm and companion animals. Fundamentals of animal science. Lecture.

173 WORKING WITH DOMESTIC ANIMALS**2 sem. hrs.**

Introduction to key techniques, procedures, and equipment associated with care and management of domestic animals. Lab. Materials charge optional. Formerly AGR 173A01 *INTRODUCTION TO ANIMAL SCIENCE LABORATORY: FARM ANIMALS* and 173A02 *INTRODUCTION TO ANIMAL SCIENCE LABORATORY: COMPANION ANIMALS*. Prerequisite: AGR 170 or concurrent registration.

190 INTRODUCTION TO AGRICULTURAL EDUCATION**2 sem. hrs.**

Introduction to formal and informal education in Agriculture. The philosophical basis, history, audiences, and methods in educational settings in agriculture. Prerequisite: Concurrent registration in AGR 191 or 192.

191 INTRODUCTION TO AGRICULTURAL EDUCATION TEACHER LICENSURE**1 sem. hr.**

Introduction to the agricultural teaching profession, licensure process, endorsements, preparation process at Illinois State University, teaching methods, classroom management and inclusion. Includes Clinical Experience: 10 hours. Prerequisite: AGR 190 or concurrent registration.

192 INTRODUCTION TO AGRICULTURAL COMMUNICATION AND LEADERSHIP**1 sem. hr.**

This course is an introduction to Agricultural Communication and Leadership; informal agricultural education settings and the communication field, media and campaign development. Prerequisite: AGR 190 or concurrent registration.

198 PROFESSIONAL PRACTICE:**FARM INTERNSHIP****1-6 sem. hrs.**

Experience in basic agricultural operations. CR/NC only. Prerequisites: Major only. Approved application required. Minimum 45 experience/hours credit.

201 RESOURCES, FOOD, AND SOCIETY: A GLOBAL PERSPECTIVE**SS****3 sem. hrs.**

Food and fiber production and distribution problems, policies, and processes analyzed within social, economic, political, and cultural contexts of societies. May not be taken under the P/NP option. Prerequisite: COM 110 or ENG 101 or concurrent registration.

203 AGRICULTURE AND THE ENVIRONMENT**SMT****3 sem. hrs.**

Examination of contemporary environmental issues that are strongly linked to current and past agricultural practices. Prerequisites: COM 110 and ENG 101; and MAT 113, 120, 130, or 145.

- 205 MICROCOMPUTER APPLICATIONS IN AGRICULTURE**
3 sem. hrs.
 Introduction to microcomputer applications specific to agriculture. Prerequisite: AGR 110 recommended.
- 213 FARM MANAGEMENT**
3 sem. hrs.
 Factors of production, such as equipment, labor distribution, cropping systems, and soils; organization and operation; types of farming.
- 214 AGRICULTURE MARKETING**
3 sem. hrs.
 Markets, price-making forces, reasons for existing practices, marketing services, and cooperative marketing. Prerequisite: AGR 110 or ECO 105 or equivalent introductory microeconomics course.
- 215 FARM SUPPLY AND FOOD INDUSTRY MANAGEMENT**
3 sem. hrs.
 Tools for profitable management of corporate and proprietary farm supply and food industry agribusinesses. Prerequisite: ACC 131 or AGR 216 or consent of the instructor.
- 216 FINANCIAL ACCOUNTING FOR AGRICULTURAL PRODUCERS**
3 sem. hrs.
 Standard farm business accounting methods and procedures, financial measures of success, inventories, depreciation, net worth, income tax, budgeting and cash flow, and business analysis. Formerly *FARM ACCOUNTING*.
- 225 RENEWABLE ENERGY AND AGRICULTURE**
3 sem. hrs.
 Explores the relationships between renewable energy and agriculture with emphasis on biofuels, wind energy, and hydropower. Prerequisite: AGR 110 or ECO 105.
- 231 MANAGING AND TEACHING IN AGRICULTURAL AND TECHNOLOGY LABORATORIES**
3 sem. hrs.
 Principles, methods and skills involved in managing and teaching in agricultural and technology laboratories. Lecture and lab. Materials charge optional. Prerequisite: AGR 130 or consent of the instructor.
- 232 AGRICULTURAL AND HORTICULTURAL MACHINERY SYSTEMS MANAGEMENT**
3 sem. hrs.
 Principles of power and machinery operation. Calibration, management and use of common agricultural and horticultural machine systems. Lecture and lab. Materials charge optional.
- 234 SOIL AND WATER CONSERVATION**
3 sem. hrs.
 Drainage, soil erosion control, water conservation on farms; planning, materials, construction, repair, and adaptation of structures to farm needs. Lecture, lab, and field trips.
- 235 AGRICULTURAL AND HORTICULTURAL STRUCTURES AND ENVIRONMENTAL SYSTEMS**
3 sem. hrs.
 Principles of design, selection, and management of structural, utility, and HVAC systems used in agricultural and horticultural production and processing. Lecture and lab. Materials charge optional.
- 252 URBAN LANDSCAPE MANAGEMENT**
3 sem. hrs.
 Cultural practices and principles in the selection and care of ornamental plants for landscape and garden use. Introduction to landscape design and maintenance. Lecture and lab. Offered even-numbered years. Prerequisites: AGR 150 and 157 or consent of the instructor.
- 254 HERBACEOUS PLANT MATERIAL**
3 sem. hrs.
 Identification, selection, use, and management of annuals, perennials, and ornamental grasses in the landscape. Lecture and lab. Field trip. Offered even-numbered years in the spring. Materials charge optional. Prerequisite: AGR 120.
- 255 LANDSCAPE PLANTS**
3 sem. hrs.
 Identification and landscape value of ornamental trees, shrubs, vines, and ground cover. Intensive field study supplemented by lectures.
- 256 LANDSCAPE PLANTS II**
3 sem. hrs.
 Continuation of AGR 255. Identification and landscape value of additional species of ornamental trees, shrubs, vines, and groundcovers. Intensive field study; lecture. Prerequisite: AGR 255.

257 FRUIT AND VEGETABLE PRODUCTION**3 sem. hrs.**

Horticultural food crop identification, production and cultural requirements. Introduction to quality determinations, pest control, and marketing. Lecture and lab. Field trip. Materials charge optional. Prerequisite: AGR 120.

262 ORNAMENTAL PLANT PRODUCTION**3 sem. hrs.**

Commercial ornamental plant production and management including: nursery site selection; plant propagation techniques; greenhouse, container and field stock; growing facilities and equipment requirements. Lecture and lab. Field trip required. Offered even-numbered years in the spring. Materials charge optional. Formerly *NURSERY MANAGEMENT*. Prerequisite: AGR 120 or 150.

271 FOODS OF ANIMAL ORIGIN**3 sem. hrs.**

Concepts of food-animal products (meat, dairy, eggs) including their nutritive value, packaging, marketing chain, and value-added technology. Lecture and lab. Materials charge optional. Prerequisites: CHE 110 and 112, or 140 and 141.

272 AGRICULTURAL GENETICS**3 sem. hrs.**

Heredity, variation, and development of domesticated plants and animals. Mendelian genetics, mutations, linkage, quantitative inheritance, and population genetics.

275 INTRODUCTION TO ANIMAL NUTRITION**4 sem. hrs.**

Study of nutrients, their metabolism and utilization; digestive physiology in ruminants, non-ruminants and avians; diet formulation and ration balancing. Materials charge optional. Prerequisite: AGR 170.

280 LIVESTOCK AND DAIRY CATTLE SELECTION**3 sem. hrs.**

Fundamentals of livestock and dairy selection; relation to production, marketing, and showing. Lab and field trips.

282 ANATOMY AND PHYSIOLOGY OF LIVESTOCK AND COMPANION ANIMALS I**3 sem. hrs.**

Anatomy and physiology of livestock and companion animals including the integumentary, skeletal, muscular, nervous, and cardiovascular systems. Materials charge optional. Formerly *PHYSIOLOGY OF FARM ANIMALS*. Prerequisites: AGR 170; BSC 196 or 197.

283 REPRODUCTIVE PHYSIOLOGY OF LIVESTOCK**3 sem. hrs.**

Comparative anatomy, physiology, and endocrinology of reproduction of livestock. Lecture and lab. Materials charge optional.

285 MEAT SCIENCE**3 sem. hrs.**

Comprehensive treatment of the meat industry and presentation of basic facts about one of our most important food products. Lecture and lab. Materials charge optional.

286 BEHAVIOR OF DOMESTIC ANIMALS**3 sem. hrs.**

Behavioral patterns and systems, group formations, socialization, physical environment, genetic and physiological factors as they relate to domestic animals. Prerequisite: AGR 170 recommended.

288 ADVANCED LIVESTOCK AND DAIRY CATTLE SELECTION**3 sem. hrs.**

Judging various species of livestock in relation to their functions in the show ring and market and the presentation of oral reasons.

292 ANATOMY AND PHYSIOLOGY OF LIVESTOCK AND COMPANION ANIMALS II**3 sem. hrs.**

Anatomy and physiology of livestock and companion animals including the respiratory, lymphatic, digestive, endocrine, urinary, and reproductive systems. Lecture and lab. Materials charge optional. Prerequisites: AGR 170; BSC 196 or 197.

**295 SUMMER INTERNSHIP IN
AGRICULTURAL EDUCATION**
3 sem. hrs.

Experience in the profession of agricultural education in high school. Includes program planning and working with special-needs students. Includes Clinical Experience: 100 hours. Prerequisite: Admission to Professional Studies.

**302 SPECIAL PROBLEMS IN
AGRICULTURE**
1-3 sem. hrs.

Special work in research interests of student and staff. Projects must be approved by the staff member and the Chairperson of the Department. Multiple enrollments are allowed; maximum 6 hours. Prerequisites: Major or minor in Agriculture or Agriculture Business, or graduate standing; 2.50 GPA required.

303 SEMINAR IN AGRICULTURE
1 sem. hr.

Prerequisite: Senior or graduate standing required.

**304 GEOSPATIAL TECHNOLOGIES
IN AGRICULTURE**
3 sem. hrs.

To understand the acquisition and analysis of geographically referenced data for the management of crop production systems.

**305 CROP GROWTH AND
DEVELOPMENT**
4 sem. hrs.

Crop management and plant growth as influenced by the environment, plant species, cropping systems, and principles of integrated crop management (ICM). Lecture and lab.

306 WEED SCIENCE
3 sem. hrs.

Principles and practices of weed management systems, including chemical and non-chemical controls. Identification and biology of common weed species. Lecture and lab.

**311 STRATEGIC AGRIBUSINESS
SALES**
3 sem. hrs.

Skills, ethics and behavior theories and concepts for the professional, business-to-business, agribusiness salesperson. Prerequisites: A minimum of 45 hours completed or in progress; AGR 215 or consent of the instructor.

**312 MANAGERIAL ACCOUNTING
FOR AGRICULTURAL
PRODUCERS**

3 sem. hrs.

Advanced farm business records and analysis with emphasis on computer applications. Formerly *ADVANCED FARM ACCOUNTING*. Prerequisites: AGR 213 and 216, or graduate standing.

**313 ADVANCED FARM
MANAGEMENT**
3 sem. hrs.

Farm business decisions and their interrelationships. Examination of statics, dynamics, and uncertainty in agricultural decision-making. Prerequisites: AGR 213 and 216, or graduate standing.

**314 MARKETING GRAIN AND
LIVESTOCK**
3 sem. hrs.

Economic principles applied to marketing grain and livestock. Consideration given to producers and distributors of grain. Prerequisite: AGR 214 or consent of the instructor, or graduate standing.

**315 FINANCIAL MANAGEMENT
AND ANALYSIS OF THE
AGRIBUSINESS FIRM**
3 sem. hrs.

Application of quantitative concepts and methods to the analysis and financial management of proprietary and cooperative agribusiness firms. Prerequisites: AGR 215; MAT 120; and AGR 216 or ACC 131 or consent of the instructor, or graduate standing.

**317 FOOD INDUSTRY MARKETING
AND STRATEGIC MANAGEMENT**
3 sem. hrs.

Marketing management and decision-making as they relate to corporate and cooperative marketing and strategic problem solving in the food industry. Prerequisite: AGR 215 or consent of the instructor, or graduate standing.

318 AGRICULTURAL FINANCE
3 sem. hrs.

Principles of agricultural finance including the capital requirements, the sources of credit, and the optimum uses of capital. Prerequisite: AGR 216 or ACC 131, or graduate standing.

319 AGRICULTURAL POLICIES AND PROGRAMS**3 sem. hrs.**

History and impact of governmental intervention in agriculture. Examination of major agricultural programs, past and present. Prerequisite: AGR 110, or graduate standing.

320 FARM COMMODITY PRICING**3 sem. hrs.**

Theory and mechanics of price determination for agriculture commodities. Prerequisite: AGR 214, or graduate standing.

324 COMMODITY FUTURES AND OPTIONS**3 sem. hrs.**

Examines the evolution of futures markets and the use of futures and options contracts as price risk management tools. Prerequisite: AGR 214 or consent of the instructor, or graduate standing.

352 RESIDENTIAL AND SPORTS TURF MANAGEMENT**3 sem. hrs.**

Principles and practices used in the management of residential and recreational turfgrasses. Lecture, lab and field trips. Materials charge optional. Prerequisites: AGR 120 and 150 or consent of the instructor, or graduate standing.

353 LANDSCAPE DESIGN**3 sem. hrs.**

Problem solving approach to landscape design. Topics include design principles, site measurement and base map preparation, functional diagrams, form composition, plant selection and preparation of preliminary and master plans. Lectures and drafting laboratories. Materials charge optional. Formerly *LANDSCAPE DESIGN AND CONSTRUCTION*. Prerequisites: AGR 252 and 255, or graduate standing.

355 PLANT BIOTECHNOLOGY AND BREEDING**3 sem. hrs.**

Breeding procedures and techniques used in developing new varieties of field crops.

357 SOIL FERTILITY AND FERTILIZERS**4 sem. hrs.**

Fundamental concepts of soil fertility and fertilizer manufacturing. Plant nutrition, factors affecting plant growth, soil-plant relationships, and macro- and micro-nutrients. Lecture, lab, and field trips. Materials charge optional. Prerequisite: AGR 157, or graduate standing.

363 AGRICULTURAL STATISTICS**3 sem. hrs.**

Principles of agricultural research for plant and animal sciences; includes design, data collection, interpretation, and presentation of results. Prerequisite: MAT 120 or 144, or graduate standing.

372 LIVESTOCK BREEDING**3 sem. hrs.**

Reproduction and principles of heredity and their application to livestock breeding; population genetics, inbreeding, relationship, outbreeding, and selection. Prerequisite: AGR 272 or BSC 219, or graduate standing.

375 ANIMAL NUTRITION**3 sem. hrs.**

Science of animal nutrition; special attention to recent discoveries pertaining to the protein, mineral, and vitamin requirements of livestock. Field trips. Offered odd-numbered years. Prerequisites: AGR 170 and 171, or graduate standing.

380 CURRENT ISSUES IN THE LIVESTOCK INDUSTRY**3 sem. hrs.**

A study of the history and evolution of the livestock industry as impacted by internal and external factors. Lecture. Prerequisites: AGR 170, 173, 272, 275, 282, 283, 286, or consent of the instructor. A minimum of 75 hours completed or in progress is recommended, or graduate standing.

381A01 LIVESTOCK INDUSTRY: BEEF CATTLE**2 sem. hrs.**

Basic principles and commercial practices involved in feedlot and cow-calf management. Lecture and lab. Prerequisites: AGR 170, 173, 272, 275, 282, 283, 286, 380 or concurrent registration, or consent of the instructor, or graduate standing.

381A03 LIVESTOCK INDUSTRY: SWINE**2 sem. hrs.**

Basic principles and commercial practices involved in swine management. Lecture and lab. Prerequisites: AGR 170, 173, 272, 275, 282, 283, 286, 380 or concurrent registration, or consent of the instructor, or graduate standing.

383 AGRICULTURAL SAFETY AND HEALTH

3 sem. hrs.

Major problems of accident causation and prevention applicable to agriculture and the need for farm safety education, engineering, and enforcement countermeasures. Half-day Saturday field trip at end of semester required. Also offered as HSC 383.

386 ANIMAL WELFARE

2 sem. hrs.

Examination of the multidisciplinary tools used to study and assess animal welfare. Prerequisites: AGR 170 and 286 or consent of the instructor, or graduate standing.

392 PRINCIPLES OF AGRICULTURAL LEADERSHIP

3 sem. hrs.

This course is a critical exploration of the theory, research and best practices of leadership applied in the agricultural field. Prerequisite: A minimum of 45 hours completed or in progress, or consent of the instructor.

394 METHODS AND PROCEDURES IN AGRICULTURAL EDUCATION

3 sem. hrs.

Procedures in planning, conducting, and evaluating an agricultural education program; pragmatic interfacing of learning theories, philosophy and guidance with instructional programs in agriculture. Includes Clinical Experience: 10 hours. Prerequisite: Admission to Professional Studies, or graduate standing.

395 PROFESSIONAL SEMINAR IN AGRICULTURE EDUCATION

2 sem. hrs.

In-depth analysis of selected trends, issues, and problems confronting the agricultural educator. Prerequisites: STT 399A01 concurrent registration, Admission to Professional Studies.

398 PROFESSIONAL PRACTICE: INTERNSHIP IN AGRICULTURE

1-6 sem. hrs.

Supervised on-the-job experience in an agriculture setting. Minimum 45 hours experience/credit. Multiple enrollments are allowed; maximum 6 hours. Prerequisites: Major in any Agriculture program; 2.50 GPA; 8 hours of course work in intern area; approved application required.