COLLEGE OF AGRICULTURE, FOOD SYSTEMS, AND NATURAL RESOURCES

www.ag.ndsu.edu/academics **Morrill Hall 315 (701) 231-8790**
Kenneth F. Grafton, Dean **D.C. Coston, Vice President for Agriculture and University Extension**

Academic programs in the College of Agriculture, Food Systems, and Natural Resources open doors to exciting and rewarding opportunities. Agriculture is the foundation upon which NDSU was established in the late 1800s. Today, the college builds on that tradition with teaching, research, and outreach that improve the lives of people throughout the region and the world.

Mission and Values

The college provides relevant and challenging academic programs that prepare students to capitalize on current and future opportunities. Programs are based on fundamental sciences and technologies applied to agricultural life and environmental disciplines as well as related social and economic fields.

NDSU agriculture is taking its place as one of the nation's leaders. Our commitment to excellence has inspired new courses of study and has built ongoing partnerships with agricultural industries and government agencies.

Demand for graduates with expertise in the college's many disciplines continues to grow rapidly. Career opportunities for men and women are expanding into new areas made possible by new technologies and a more comprehensive global perspective.

Food safety and security, biotechnology and genetics, sustainable production and land stewardship, bio-energy and bio-products, and human/animal health are emerging national priorities. Our faculty members are at the forefront of these and similar critical issues. Our students can engage their interests while gaining valuable hands-on learning experiences in the field and laboratories, and through interactions with business partners across the region.

Degree Programs

The college offers the Bachelor of Science (B.S.) degree for all majors and the Bachelor of Arts (B.A.) as an optional degree in economics. Students must meet the following basic requirements to qualify for the Bachelor of Science degree:

	Credits
Program Core Requirements	24
First-Year Experience	1
Orientation Course	1
Quantitative Reasoning[1]	3
Written & Oral Communication[1]	12
Science & Technology[1]	10
A three-discipline minimum is recommended across 12 credits in the two following categories:	
Humanities & Fine Arts[1]	6
Social & Behavioral Sciences[1]	6
Wellness[1]	2

1 Refer to general education requirements. Elements may vary with changes to university requirements.

Candidates for the Bachelor of Science degree must complete a minimum of 128 credits in one of the majors in the college. They must also satisfy the requirements of the university. Detail is provided on core requirements and options for each major. Check with advisors and consult the fact sheet for each program.

The pre-veterinary medicine program does not result in a B.S. degree. Students are urged to select an additional major area of study. (Refer to Veterinary and Microbiological Sciences; and Animal Science)

Minors

Approved minors and/or options are available in most academic areas to help students define their academic programs.

Affiliated Programs

A major in Agricultural and Biosystems Engineering is offered by the College of Engineering and Architecture. The College of Human Development and Education offers a major in agricultural education and the College of Arts, Humanities and Social Sciences offers both a major and minor in agricultural communication.

Interdisciplinary Studies

The college contributes strongly to interdisciplinary studies in natural resources management, food safety, logistics management, and several graduate programs. See Interdisciplinary Programs section of this Bulletin for more information.

Agricultural Education

NDSU is designated by the State Board for Career and Technical Education as the recognized institution for preparing teachers of Agricultural Education. See College of Human Development and Education, School of Education, section of this Bulletin for more information.

Graduation Status

Degree programs are designed for completion in four years. Graduation status review is available to students each semester after 75 credits are earned.

Graduate and Professional Schools

The college's academic programs are excellent preparation for continued formal education in graduate school programs and in professional programs such as law schools and medicine. For more information on graduate school opportunities at NDSU see: www.ndsu.edu/gradschool.

Honor System

A student-elected honor system recognizes the ability of students to govern themselves. The honor system, in place since 1955, provides an enhanced learning environment. All students enrolled in agriculture courses are required to uphold the honor system.
(www.ag.ndsu.edu/academic/honor.htm)

Scholarships

Students in the college who have selected one of the college's majors are eligible for scholarships through their major department and the dean's office. Scholarships are awarded to students who have demonstrated excellence in their courses. About one-third of students in the college receive scholarships. Students are encouraged to contact their major department or the college Web site for scholarship opportunities.
(www.ag.ndsu.edu.academics/coaschol.htm)

Student Organizations

Nearly 30 agriculture-related clubs and organizations provide opportunities for students to develop leadership, teamwork, interpersonal and communication skills. (www.ag.ndsu.edu/academics/studentorgs.htm)

Field Experience, Internships, Cooperative Education

Students gain practical experience and credits by enrolling in a supervised field experience (internship) offered through individual departments. Another option, offered by the Career Center, provides undergraduate and graduate students with career-enhancing experiences and academic credits through the Cooperative Education program. The number of cooperative education credits allowed for graduation varies by program, but should not exceed six for any program in the college.

International Study

The college encourages students to gain international perspectives in their studies. Besides study abroad, students might consider adding the international studies major to their program in the college. Additional information is available from departmental offices or through the university's Office of International Programs.

General Agriculture Major

The degree program in General Agriculture is designed to serve students who wish to pursue a college education in a broad area of agriculture or who want to tailor a program to meet their specific career objectives. Traditionally, students interested in careers focusing on agricultural production follow this program of study.

Students electing to graduate with a General Agriculture major must file a "plan of study" with the General Agriculture Coordinating Committee by the third week of the second semester of the junior year. This plan of study must include a "statement of goals" or why a tailored degree is desired and an outline of courses to be taken to meet their stated career goals. Identification of the capstone course and any internship that the student plans to take also is to be included in the plan of study.

Sample '08-09 Curriculum
General Agriculture Major

General Education Requirements	Credits
First Year Experience (F):	
AGRI 189, Skills for Academic Success	1
Communications (C):	
COMM 110, Fund of Public Speaking	3
ENGL 110[1], 120, College Comp I, II	3, 3
ENGL 320, Business & Prof Writing	3
Quantitative Reasoning (R)	3
Science & Technology (S):	
CHEM 121, 121L, Gen Chem I	3, 1
PLSC 315, Genetics	3
CSCI 114, Microcomputer Packages or	
CSCI 116, Business Use of Comput.	3 or 4
Humanities & Fine Arts (A)	6
Social & Behavioral Sciences (B)	6
Wellness (W)	2
Cultural Diversity (D)[2]	--
Global Perspective (G)	--
Total	***40***

Major Requirements	Credits
Discipline Area Courses[3]	42
Total	***42***

Additional Requirements	Credits
AGRI 150, Ag Orientation	1
MATH 103, College Algebra	3
Math/Science Electives[3]	4
Agriculture Electives[3]	12
Free Electives (for degree completion)	26
Total	***46***

Curriculum Total ***128***

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2 May double count with select Humanities & Fine Arts, Social & Behavioral Science, and/or Science & Tech. Gen Ed courses.

3 Refer to department or curriculum guide for course options.

General Agriculture Minor

A minor in General Agriculture may be obtained by satisfactorily completing 24 credits with at least six credits in each of any four disciplines offered by the College of Agriculture, Food Systems, and Natural Resources. The minor is intended for students who are majoring in a college other than Agriculture, Food Systems, and Natural Resources. A minimum of eight credits must be taken at NDSU.

Sample '08-09 Curriculum
General Agriculture Minor

Requirements	Credits
Discipline Area Courses[1]	24
Curriculum Total	***24***

1 Refer to department or curriculum guide for course options.

Department of Agribusiness and Applied Economics

www.ndsu.edu/agecon

Programs in agribusiness and agricultural economics apply economic principles to the use of private and public resources to provide a safe and affordable food supply, to maintain a sustainable agricultural and natural resource base, and to manage natural and environmental resources for current and future generations. Students in economics develop a solid foundation for analyzing how a society solves such problems as what goods and services to produce, how to organize production, and for whom goods and services are to be produced.

As the global population grows and the world's economies become more interdependent, economic principles become increasingly important for problems facing the agribusiness industry. Students interested in careers in agribusiness have several options. Beginning in their sophomore year, students take courses in management, marketing, and finance, all concentrating on the unique aspects of food system economics. Specialization in upper division courses permits students to concentrate in areas of particular interest: management, finance, or marketing.

Students in Agricultural Economics may focus on management, finance, and marketing in agriculture and food systems. However, the Agricultural Economics program allows students greater flexibility in selecting courses best fitting their career objectives and personal interests. This major requires a broader background in the agricultural sciences, with courses from other departments in the College of Agriculture, Food Systems, and Natural Resources providing students the scientific basis for applying economic concepts to decision problems in food systems. The Agricultural Economics major is ideally suited for students with career objectives in production agriculture, in farm and natural resource policy analysis, or in industries providing service to agriculture.

Besides being invaluable for understanding contemporary political, economic, and social issues, students majoring in Economics are well prepared for careers in business, law, education, public administration, and research. The Economics major is in high demand, as students and employers recognize the need to understand global trends in order to contribute to private and public economic decisions. Economics courses cover a wide range of applications and theory in managerial economics, labor markets, economic development, micro- and macroeconomics, market structure, natural resources and environmental economics, and globalization and trade.

The department offers minors in Economics and in Agribusiness.

Curriculum Options

The Department of Agribusiness and Applied Economics offers three majors: (1) Agribusiness, (2) Agricultural Economics, and (3) Economics.

Agribusiness Major

Students choose one of three areas of specialization:

Management: This option provides students with a broad background, preparing them for general career alternatives in agribusiness.

Finance: This option prepares students for careers in agribusiness finance, agricultural lending, financial institution management, accounting, insurance, and investment.

Marketing: This option prepares students for careers in agricultural marketing, sales, or food product marketing.

In the Agribusiness program:

1. Students are exposed to a range of methods useful in agribusiness decision-making. Agribusiness graduates will master problem-solving skills to face challenges likely to be encountered in their professional careers.
2. Agribusiness students are required to participate in an internship during their studies. Employers continue to place high importance on work-related experience when they evaluate potential employees. Employers are assured that all NDSU Agribusiness graduates have gained this valuable work experience through the required internship.
3. Collaboration with the College of Business leads to the concurrent satisfaction of one of the minors offered by the College of Business. Students may select business courses for the minor that complement their agribusiness interests.

Sample '08-09 Curriculum
Agribusiness Major

General Education Requirements	Credits
First Year Experience (F):	
AGRI 189, Skills for Academic Success	1
Communications (C):	
COMM 110, Fund of Public Speaking	3
ENGL 110[1], 120, College Comp I, II	3, 3
ENGL Upper Level Writing Course[2]	3
Quantitative Reasoning (R):	
STAT 330, Intro Stats	3
Science & Technology (S)	10
Humanities & Fine Arts (A)	6
Social & Behavioral Sciences (B):	
ECON 201, Prin of Microeconomics	3
ECON 202, Prin of Macroeconomics	3
Wellness (W)	2
Cultural Diversity (D)[3]	--
Global Perspective (G)	--
ECON 202, Prin of Macroeconomics	
Total	***40***

Major Requirements	Credits
AGEC 242, Intro to Agricultural Mgmt	4
AGEC 244, Agricultural Marketing	3
AGEC 246, Intro to Agricultural Finance I	4
AGEC 339, Quant Meth & Decision Making	3
ECON 341, Intermediate Microeconomics	3
ECON 343, Intermediate Macroeconomics	3
AGEC 344, Agriculture Price Analysis	3
AGEC 346, Applied Risk Analysis	3
AGEC 445, Agribusiness Industrial Strategy	3
AGEC 491, Seminar (Capstone Course)	1
AGEC 496, Internship	2
ACCT 200, Elements of Accounting I	3
ACCT 201, Elements of Accounting II	3
Science/Tech/Ag Electives[2]	9
Specialized Electives (min)[2]	6
Total	***53***

Additional Requirements	Credits
AGRI 150, Ag Orientation	1
COMM Elective	3
MATH 146, Applied Calculus I	4
STAT 331, Regression Analysis or ECON 410, Intro to Econometrics	2 or 3
Free Electives (for degree completion)	24-25
Total	*34-36*

Curriculum Total *128*

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2 Refer to department or curriculum guide for course options.

3 May double count with select Humanities & Fine Arts, Social & Behavioral Science, and/or Science & Tech. Gen Ed courses.

Agribusiness Minor

The Agribusiness minor is a two-track minor (Agribusiness and Corporate Agribusiness) that exposes students to applications of fundamental business concepts in an agricultural or food systems setting. The Agribusiness track is a 17 credit minor that primarily draws on courses in Agribusiness and Agricultural Economics and emphasizes Agribusiness applications throughout its curriculum. The Corporate Agribusiness track is a 21 credit minor that emphasizes principles and courses applicable to corporate business. The Corporate Agribusiness track is restricted to students whose major is in the College of Agriculture, Food Systems, and Natural Resources. The Agribusiness track is open to all NDSU majors. A minimum of eight credits must be taken at NDSU.

Sample '08-09 Curriculum Agribusiness Minor: Agribusiness Track

Requirements	Credits
ECON 201, Prin of Microeconomics	3
AGEC 242, Intro to Agricultural Management	4
AGEC 244, Agricultural Marketing	3
AGEC 246, Intro to Agricultural Finance I	4
Ag/Applied Econ Electives[1]	3

Curriculum Total *17*

1 Refer to department or curriculum guide for course options.

Sample '08-09 Curriculum Agribusiness Minor: Corporate Agribusiness Track

Requirements	Credits
ECON 201, Prin of Microeconomics	3
ACCT 102, Fund of Accounting	3
BUSN 340, Prin of Finance	3
BUSN 250, Foundations of Mgmt	3
BUSN 360, Foundations of Marketing	3
Ag/Applied Econ Electives[1]	3
Mgmt, /Marketing/Finance Electives[1]	3

Curriculum Total *21*

1 Refer to department or curriculum guide for course options.

Agricultural Economics Major

Core requirements in the Agricultural Economics major include introductory courses in agricultural management, finance, and marketing. Students may choose to take all of the advanced courses in the department, yet flexibility allows building a program based on a student's individual career goals. A total of 10 courses must be taken in agribusiness or agricultural economics, plus four additional courses in micro- and macroeconomics.

Sample '08-09 Curriculum Agricultural Economics Major

General Education Requirements	Credits
First Year Experience (F):	
AGRI 189, Skills for Academic Success	1
Communications (C):	
COMM 110, Fund of Public Speaking	3
ENGL 110[1], 120, College Comp. I, II	3,3
ENGL Upper Level Writing Course[2]	3
Quantitative Reasoning (R):	
STAT 330, Intro Stats	3
Science & Technology (S)	10
Humanities & Fine Arts (A)	6
Social & Behavioral Sciences (B):	
ECON 201, Prin of Microeconomics	3
ECON 202, Prin of Macroeconomics	3
Wellness (W)	2
Cultural Diversity (D)[3]	--
Global Perspective (G)	--
ECON 201, Prin of Macroeconomics	
Total	*40*

Major Requirements	Credits
AGEC 242, Intro to Agri Management	4
AGEC 244, Agricultural Marketing	3
AGEC 246, Intro to Agricultural Finance I	4
AGEC 339, Quant Meth. & Decision Making	3
AGEC 342, Farm & Agribusiness Mgmt II or AGEC 344, Agriculture Price Analysis or AGEC 346, Applied Risk Analysis.	3
AGEC 375, Applied Agricultural Law or AGEC 484, Agricultural Policy	3
ECON 341, Intermediate Microeconomics	3
ECON 324, Money and Banking or ECON 343, Intermediate Macroeconomics	3
ACCT 102, Fundamentals of Accounting or ACCT 200, Elements of Accounting I and ACCT 201, Elements of Accounting II	3 or 6
Agribusiness & Applied Econ Electives[2]	9
Science/Tech, Agriculture Electives[2]	9
Capstone Experience[2]	3
Total	*50-53*

Additional Requirements	Credits
AGRI 150, Ag Orientation	1
COMM Electives[2]	3
MATH 146, Applied Calculus I	4
STAT 331, Regression Analysis or ECON 410, Intro to Econometrics	2 or 3
Free Electives (for degree completion)	25-28
Total	*35-39*

Curriculum Total *128*

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2 Refer to department or curriculum guide for course options.

3 May double count with select Humanities & Fine Arts, Social & Behavioral Science, and/or Science & Tech. Gen Ed courses.

Economics Major

Economics is the social science that deals with problems of scarcity. Economics provides a systematic and logical framework for analyzing how a society solves such problems as what goods and services to produce, how to organize production, and for whom goods and services are to be produced. Knowledge of economics is necessary for understanding and dealing with such topics as inflation, unemployment, international trade and monetary systems, economic growth, government finance, and various forms of market regulation. Besides being important for understanding contemporary political, economic, and social issues, economics is invaluable in developing career skills for business, law, teaching, public administration, and research. Both verbal and mathematical training are involved in learning economics.

Degree Programs

Undergraduate students majoring in economics may choose either the Bachelor of Arts degree or the Bachelor of Science degree. During the freshman year, both programs require courses such as English, mathematics, and science. Introductory courses in economics include (a) microeconomics, which is the study of relative prices, the consequences of different market forms, and consumer behavior, (b) macroeconomics, which includes study of the general level of prices, employment, and output.

Areas of specialization may emphasize such fields as money and banking, international economics, labor, industrial organization, environmental and resource economics, or public finance.

Requirements for the Bachelor of Arts degree include two years of one foreign language. For the Bachelor of Science degree, students are required to select a minor of study from another discipline.

Career Choices

Economics majors are employed in virtually every area of the economy. In banks and financial institutions they forecast market activity, exchange rates, and interest rate movements. In industrial firms they forecast sales, evaluate changes in cost conditions, analyze changes in international economic conditions, and provide data needed for critical decisions.

Governments are among the largest employers of economists because agencies rely on the skills of these professionals to evaluate proposed projects and policies and review tax policies. Virtually no other academic major offers the diversity in employment opportunities and flexibility among careers, as does the study of economics.

A background in economics provides students with a set of versatile skills that will not become outdated with introduction of new technology.

Sample '08-09 Curriculum Economics Major

General Education Requirements	Credits
First Year Experience (F):	
AGRI 189, Skills for Academic Success	1
Communications (C):	
COMM 110, Fund of Public Speaking	3
ENGL 110[1], 120, College Comp I, II	3,3
ENGL Upper Level Writing Course[2]	3
Quantitative Reasoning (R):	
STAT 330, Intro Stats	3
Science & Technology (S)	10
Including: CSCI 114, Microcomputer Pkgs or CSCI 116, Business Use of Computers	
Humanities & Fine Arts (A)	6
Social & Behavioral Sciences (B)	6
(satisfied with major requirements)	
Wellness (W)	2
Cultural Diversity (D)[3]	--

Global Perspective (G)	--
ECON 201, Prin of Macroeconomics	
Total	***40***

Major Requirements	**Credits**
ECON 201, Prin of Microeconomics	3
ECON 202, Prin of Macroeconomics	3
ECON 341, Intermediate Microeconomics	3
ECON 343, Intermediate Macroeconomics	3
ECON 491, Seminar (Capstone Course)	1
ECON Electives[2]	15
Total	***28***

Related Requirements	**Credits**
MATH 146, Applied Calculus I.	4
STAT 331, Regression Analysis or	
ECON 410, Intro to Econometrics	2 or 3
Additional Arts/Humanities Electives	3
Additional Social & Behavioral Sci Electives	6
Minor/Electives (for degree completion)	44-45
Total	***60***

Curriculum Total ***128***

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2 Refer to department or curriculum guide for course options.

3 May double count with select Humanities & Fine Arts, Social & Behavioral Science, and/or Science & Tech. Gen Ed courses.

Economics Minor

The minor in Economics complements many other majors by helping the student develop an analytical approach to understanding human events from the perspective of this discipline.

Sample '08-09 Curriculum Economics Minor

Requirements	**Credits**
ECON 201, Prin of Microeconomics	3
ECON 202, Prin of Macroeconomics	3
ECON 341, Intermediate Microeconomics or	
BUSN 451, Managerial Economics	3 or 4
ECON 343, Intermediate Macroeconomics	3
ECON Electives[1]	5-6

Curriculum Total ***18***

1 Refer to department or curriculum guide for course options.

Department of Agricultural and Biosystems Engineering

www.ageng.ndsu.nodak.edu

Agricultural Systems Management Major

The Agricultural Systems Management (ASM) program combines an understanding of the agricultural, biological, and physical sciences with economics, managerial, and technical skills. This understanding of science, systems management, and applications engineering can be applied to a career in the production and processing of food, feed, fiber, and fuel, and the marketing, sales, and distribution of agricultural products and services. Students focus on the application of engineering designs, the study of technology used in agriculture, and the integration of business management concepts in the agricultural, food, and closely related industries. Students complete courses in machinery principles, off-road power systems, precision agriculture, commodity handling and processing, natural resources management, electrical and electronic systems, and information and decision support technology.

Taking courses in accounting, economics, marketing, management, business law, sales, and finance develops a strong business background. Personal career objectives may be pursued through specialization in areas such as agribusiness and production agriculture. Students are encouraged to minor in agribusiness, business administration, communications, or another agricultural discipline.

Agricultural Systems Management graduates are often employed in positions that provide the link between the researcher, designer, engineer, manufacturer, and the consumer. Employers include: 1) companies and agencies that provide inputs, products, and services for agricultural production; 2) companies or agencies in the business of handling, storing, processing, and distributing agricultural products/commodities and processed food or non-food products; and 3) companies and agencies that supply physical and business services to rural and urban communities. This degree is ideal for those interested in careers in technical sales or management of an agriculture-related business involved in production, processing, or manufacturing. Graduates of the program are frequently self-employed as owners/operators of commercial farms, ranches, and businesses. They are often also employed as crop consultants or production specialists. The flexibility of the program allows students the opportunity to tailor the curriculum to complement their career goals.

Students interested in the innovation, design, testing, manufacturing, and development aspects of products, processes, or systems for agricultural production, food, and value-added processing of commodities, or sustainable management of environmental resources should consider the Agricultural and Biosystems Engineering curriculum in the College of Engineering and Architecture.

Sample '08-09 Curriculum Agriculture Systems Management Major

General Education Requirements	**Credits**
First Year Experience (F):	
ABEN 189, Skills for Academic Success	1
Communications (C):	
COMM 110, Fund of Public Speaking	3
ENGL 110[1], 120, College Comp I, II	3,3
ENGL Upper Level Writing Course[2]	3
Quantitative Reasoning (R):	
STAT 330, Intro Stats	3
Science & Technology (S):	
CHEM 121, Gen Chem I,	3
CHEM 122, Gen Chem I,	3
Phys 211, 211L, College Physics I, lab.	3,1
Humanities & Fine Arts (A)	6
Social & Behavioral Sciences (B):	
ECON 201, Prin of Microeconomics	3
ECON 202, Prin of macroeconomics	3
Wellness (W)	2
Cultural Diversity (D)[3]	--
Global Perspective (G)	--
ECON 201, Prin of Microeconomics	
Total	***40***

Major Requirements	**Credits**
ASM 115, Fund of ASM	3
ASM 125, Fabrication & Construction Tech	3
ASM 225, Computer Applications in ASM	3
ASM 264, Natural Resource Mgt Systems	3
ASM 323, Post Harvest Technology	3
ASM 354, Electricity & Electronic App.	3
ASM 373, 374, Tractors & Power Units, Lab	3,1
ASM 378, Machinery Principles & Mgt.	3
ASM 429, Hydraulic Power Prin & Appl.	3
ASM 454, Prin of Site Specific Agriculture	3
ASM 475, Mgt of Agri Syst (Capstone)	2
ASM 491, Seminar.	1
ASM 496, Field Experience (Expo)	1
Total	***35***

Additional Requirements	**Credits**
ACCT 102, Fundamentals of Accounting or	
ACCT 200, Elements of Accounting I and	
ACCT 201, Elements of Accounting II[4]	3-6
AGRI 150, Ag Orientation	1
CSCI 114, Microcomputer Packages or	
CSCI 116, Busn Use of Computers	3 or 4
MATH 103, College Algebra	3
MATH 105, Trigonometry or higher	3
PSYC 111, Intro to Psychology	3
Agriculture/Biological Science Electives[2]	12
Specialization/Minor Credits[2]	16
Free Electives (for degree completion)	5-9
Total	***53***

Curriculum Total ***128***

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2 Refer to department or curriculum guide for course options.

3 May double count with select Humanities & Fine Arts, Social & Behavioral Science, and/or Science & Tech. Gen Ed courses.

4 ACCT 200, Elements of Accounting I (3cr) & ACCT 201 (3cr), Elements of Acct II are required for the Dealership Mgmt option.

Curriculum Options

Agribusiness or Business Administration (16)

Students select courses in agribusiness, business, and related areas to achieve career goals in agricultural and related business areas.

A Dealer Management Specialization within the business option is available. This specialization is designed for students who want careers as equipment dealership managers or with equipment manufacturers. Technology, agribusiness, and communication are emphasized. Requirements include a minor in agribusiness, or business administration and two paid internships with equipment dealerships. Several industry scholarships are available to students enrolled in this specialization.

Production Agriculture (16)

Students select courses in agricultural sciences and supporting areas to achieve career goals in the technical and management aspects of production agriculture systems.

Agricultural/Industrial Equipment Option

North Dakota State University and North Dakota State College of Science (NDSCS) collaboratively offer the Ag/Industrial Equipment option in the Agricultural Systems Management program. This collaboration gives students primary experience in physical science, engineering technology, and machinery systems with complementary hands-on training in mechanized systems laboratories at NDSCS. Students complete their education at NDSU in agricultural systems management and complement their program by selecting a business specialization or minor emphasizing courses in management, sales, marketing, finance, and personnel management. Completion of one or more cooperative education or internship placements in the equipment industry also is required.

Potential positions available for graduates in this option include: salesperson, service manager, parts and inventory control manager, sales manager, territory service manager, finance manager, general manager, regional marketing representative, manufacturer's representative, district sales manager, and warranty manager.

Sample '08-09 Curriculum
Agricultural/Industrial Equipment Option[1]

First Year at NDSCS	Credits
ENGL 110, 120, College Composition I, II	6
MATH 103, College Algebra	3
MATH 105, Trigonometry	3
ECON 201, 202, Micro & Macro Economics	3,3
COMM 110, Fund of Public Speaking	3
TECH 121, Engine Fund	4
DTEC 122, Preventive Main/Power Trains	3
DTEC 101, Electrical Systems	2
DTEC 112, Intro to Diesel Engines	3
CSCI 101, Computer Literacy	2
Total	*34*

1 The remaining curriculum is taken at NDSU in the ASM major.

Agricultural Systems Management Minor

A minor in Agricultural Systems Management is available to students from other majors by working with department faculty to select 16 credits in Agricultural Systems Management. A minimum of eight credits must be taken at NDSU.

Sample '08-09 Curriculum
Agriculture Systems Management Minor

Requirements	Credits
ASM 264, Natural Resource Mgt Systems	3
ASM 354, Electricity & Electronic Appl	3
ASM 373, Tractors & Power Units or ASM 378, Machinery Principles & Mgt	3
ASM Electives[1]	7
Curriculum Total	*16*

1 Refer to department or curriculum guide for course options.

Department of Animal Science

www.ag.ndsu.nodak.edu/ars/templates/indexes/programindex.htm

Animal Science Major

The Animal Science program offers students the ability to obtain an understanding of the "big picture" of animal agriculture including courses that emphasize animal anatomy and physiology, nutrition, livestock production systems, agricultural business and marketing, and factors influencing product quality in a friendly environment that encourages learning opportunities outside of the classroom. The Animal Science faculty and staff are dedicated to providing students with the background information, as well as up to date information regarding the latest techniques in animal production and business insight, animal handling and husbandry, and laboratory skills.

Besides taking the required courses necessary for the Animal Science major, students have the opportunity to complete coursework that helps meet their specific career goals. Internships are encouraged to obtain specific skills and develop contacts necessary for success after graduation.

Students graduating with a major in Animal Science are accepted in professional schools including veterinary school, and graduate programs specializing in nutrition, physiology, meat science, biotechnology, and microbiology. Graduates from the Animal Science program are highly competitive for careers in agribusiness, management for livestock production systems, livestock media and public relations, technical positions in many aspects of animal agriculture, as well as leaders in livestock production on farms and ranches.

Curriculum Options

Two options, each designed to strengthen career preparation, are available:

Production/Business: This option is for students interested in careers associated with the production, agribusiness, and management of animals and the products they produce.

Science/Pre-Vet: This option is designed for students who are interested in specific careers that require advanced course work in the biological sciences to meet the requirements for veterinary school, graduate school programs, or advanced technical programs. It also is designed to prepare students for graduate study or to provide an animal-oriented degree while meeting the course requirements for veterinary schools.

Transfer credits: Transfer courses with grade C or better only will be accepted for Animal and Range Sciences courses in the major.

Major: All Animal Science majors must meet the following requirements.

Sample '08-09 Curriculum
Animal Science Major

General Education Requirements	Credits
First Year Experience (F):	
AGRI 189, Skills for Academic Success	1
Communications (C):	
COMM 110, Fund of Public Speaking	3
ENGL 110[1], 120, College Comp I, II	3,3
ENGL Upper Level Writing Course[2]	3
Quantitative Reasoning (R):	
STAT 330, Intro Stats	3
Science & Technology (S):	
CHEM 121, 121L, Gen Chemistry I, Lab	3,1
PLSC 110, World Food Crops	3
PLSC 315, Genetics	3
Humanities & Fine Arts (A)	6
Social & Behavioral Sciences (B)	6
Including: ECON 201, Prin of Microeconomics	
Wellness (W)	2
Cultural Diversity (D)[3]	--
Global Perspective (G)	--
ECON 201, Prin of Microeconomics	
Total	*40*

Major Requirements	Credits
AGRI 150, Ag Orientation	1
AGEC 242, Intro to Agricultural Mgmt	4
AGEC 244, Agricultural Marketing	3
ANSC 114, Intro to Animal Science	3
ANSC 123, Feeds & Feeding	3
ANSC 220, Livestock Production	3
ANSC 222, Meat Animal Evaluation	2
ANSC 320, Dairy Cattle Selection or ANSC 330, Meat Selection, Grading, Judging or ANSC 331, Livestock Selection	1-2
ANSC 323, Fund of Nutrition	3
RNG 336, Intro to Range Mgmt	3
ANSC 357, Animal Genetics	3
ANSC 463, 463L, Physio of Reprod, Lab	3,1
ANSC 470, Applied Nutrition	4
ANSC 491, Seminar	1
BIOL 150, Gen Biology I	3
MICR 202, 202L, Intro to Microbiology, Lab	2,1
CHEM 260, Elements of Biochemistry	4
MATH 103, College Algebra	3
VETS 135, Anat & Phys of Domestic Animals	3
ANSC Electives[2]	4-5
Total	*59*

Option Choices:

Option 1: Production/Business	Credits
MICR 465, Fundamentals of Animal Disease	3
Animal Production Electives[2]	4
Total	*7*

Option 2: Science/Pre-Vet	Credits
CHEM 240, Survey of Organic Chem	3
Natural/Physical Science/Math Electives[2]	9
Animal Production Electives[2]	2
Total	*14*

Curriculum Total *128*

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2 Refer to department or curriculum guide for course options.

3 May double count with select Humanities & Fine Arts, Social & Behavioral Science, and/or Science & Tech. Gen Ed courses.

Sample '08-09 Curriculum
Animal Science Minor

Requirements	Credits
ANSC 114, Intro to Animal Science	3
ANSC 123, Feeds & Feeding	3
ANSC 220, Livestock Production	3
ANSC 222, Meat Animal Evaluation	2
ANSC/RNGElectives[1]	5
Curriculum Total	*16*

1 Refer to department or curriculum guide for course options.

Equine Studies Major

The Equine Studies major is designed to prepare students for careers in the equine industry and related fields. Course work includes practical husbandry and equitation skills, scientific principles related to management of the equine, and study of the modern equine industry and business practices.

Sample '08-09 Curriculum
Equine Studies Major

General Education Requirements	Credits
First Year Experience (F):	
AGRI 189, Skills for Academic Success	1
Communications (C):	
COMM 110, Fund of Public Speaking	3
ENGL 110[1], 120, College Comp I, II	3,3
ENGL 320, Business & Profess Writing	3
Quantitative Reasoning (R):	
STAT 330, Intro Stats	3
Science & Technology (S):	
CHEM 121, 121L, Gen Chemistry I, Lab	3,1
MICR 202, 202L, Intro to Microbiol, Lab	2,1
BIOL/ZOO 126, Human Biology or BIOL 150, Gen Biology I	3
Humanities & Fine Arts (A)	6
Social & Behavioral Sciences (B)	6
Including: ECON 201, Prin of Microeconomics	
Wellness (W)	2
Cultural Diversity (D)[2]	--
Global Perspective (G)	--
ECON 201, Prin of Microeconomics	
Total	*40*

Major Requirements	Credits
ANSC 123, Feeds & Feeding	3
ANSC 260, Intro to Equine Studies	2
ANSC 260L, Equine Care & Mgmt Practicum	1
ANSC 261, Basic Equitation & Horsemanship	1
ANSC 357, Animal Genetics	3
ANSC 360, Equine Nutrition	3
ANSC 364, Equine Anatomy & Physiology	3
ANSC 365, Equine Evaluation	2
ANSC 480, Equine Industry & Prod Sys	3
ANSC 491, Seminar	1
ANSC 494, Internship	2
RNG 336, Intro to Range Mgmt	3
ANSC/ZOO 463, Phys of Reproduction	3
ANSC/ZOO 463L, Phys of Reproduction Lab	1
ANSC Electives[3]	5
Total	*36*

Related Requirements	Credits
AGEC 242, Intro to Agricultural Management	4
AGEC 244, Agricultural Marketing	3
AGRI 150, Ag Orientation	1
CHEM 260, Elements of Biochemistry	4
MATH 103, College Algebra	3
MICR 465, Fund of Animal Disease	3
PLSC 110, World Food Crops	3
PLSC 315, Genetics	3
VETS 135, Anat & Phys of Domestic Animals	3
Electives (to complete 128 credits)	25
Total	*52*

Curriculum Total *128*

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2 May double count with select Humanities & Fine Arts, Social & Behavioral Science, and/or Science & Tech. Gen Ed courses.

3 Refer to department or curriculum guide for course options.

Sample '08-09 Curriculum Equine Studies Minor

Students from other majors may minor in Equine Studies by completing a minimum of 16 credits in the following courses. A minimum of eight credits must be taken at NDSU.

Requirements	Credits
ANSC 123, Feeds & Feeding	3
ANSC 260, Intro to Equine Studies	2
ANSC 260L, Equine Care & Mgmt Pract or ANSC 261, Basic Equit & Horsemanship	1
ANSC 360, Equine Nutrition or ANSC 364, Equine Anatomy & Physiology	3
ANSC 365, Equine Evaluation	2
ANSC Electives[1]	5

Curriculum Total *16*

1 Refer to department or curriculum guide for course options.

Veterinary Technology Major

http://vettech.ndsu.nodak.edu

Veterinary Technology is an exciting and challenging major that offers a multitude of career opportunities in animal health care and related areas. The Veterinary Technology major leads to the B.S. degree. This major offers a well-rounded program of general and clinical studies. Graduates are prepared not only for traditional veterinary practice careers, but also for pursuit of emerging non-traditional careers through the choice of electives and minor areas of study.

The first pre-professional year of the Veterinary Technology program is open to all interested students and offers an opportunity to explore the veterinary technology field. Advancement into the professional program in the second year is limited to a maximum of 28 students who are selected on a competitive basis.

The American Veterinary Medical Association accredits the Veterinary Technology program.

Sample '08-09 Curriculum Veterinary Technology Major

General Education Requirements	Credits
First Year Experience (F):	
AGRI 189, Skills for Academic Success	1
Communications (C):	
COMM 110, Fund of Public Speaking	3
ENGL 110[1], 120, College Comp I, II	3,3
ENGL 320, Business & Profess Writing	3
Quantitative Reasoning (R):	
MATH 104, Finite Math or higher	3
Science & Technology (S):	
MICR 202, 202L, Intro to Microbio, Lab	2,1
CSCI 114, Microcomputer Pkgs or CSCI 116, Busn Use of Computers	3 or 4
PLSC 315, Genetics, Lab	3,1
Humanities & Fine Arts (A)	6
Social & Behavioral Sciences (B)	6
Wellness (W)	2
Cultural Diversity (D)[2]	--
Global Perspective (G)	--
Total	*40*

Major Requirements	Credits
VETS 115, Medical Terminology	1
VETS 125, Animal Restraint	2
VETS 130, Companion Animal Breeds	1
VETS 135, Anat & Phys of Domestic Animals	3
VETS 136, Anat & Phys Lab	1
VETS 150, Intro to the Vet Profession	1
VETS 440, Zoonoses	3
VETS 255, Fund of Vet Radiography[3]	
VETS 256, Vet Clinical Tech. & Instruments[3]	4
VETS 259, Small Animal Diseases[3]	2
VETS 357, Vet Pharmacology[3]	3
VETS 358, Vet Surg Nurs Tech[3]	4
VETS 359, Vet Hosp Info & Procedures[3]	2
VETS 385, Vet Clin Pathology I[3]	3
VETS 386, Vet Clin Pathology II[3]	3
VETS 387, Vet Clin Pathology III[3]	3
VETS 481, Ward Care/Clinic Care[3]	4
VETS 483, Clinical Veterinary Practicum[3]	4
VETS 485, Vet Tech Externship[3]	6
Total	*53*

Related Requirements	Credits
ANSC 114, Intro to Animal Science	3
BIOL 150, 150L, Gen Biology I, Lab or BIOL 151, 151L, Gen Biology II, Lab	3,1
CHEM 121, 121L, Gen Chem I, Lab or CHEM 117, 117L, Chem Concpt/Appl, Lab	3,1
MICR 465, Fund of Animal Disease	3
Total	*14*

Additional Requirements	Credits
Free Electives (for degree completion)	21
Total	*21*

Curriculum Total *128*

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2 May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech. Gen Ed courses.

3 Must be admitted into professional program.

Large Animal Veterinary Technology Minor

The minor in Large Animal Veterinary Technology is reserved for Veterinary Technology majors only. Students may earn this minor by completing a minimum of 16 credits in the following courses. A minimum of eight credits must be taken at NDSU.

Sample '08-09 Curriculum Large Animal Veterinary Technology Minor

Requirements	Credits
ANSC 123, Feeds & Feeding	3
ANSC 220, Livestock Production	3
ANSC 260, Intro to Equine Studies	2
VETS 482, Large Animal Techniques	3
ANSC Electives[1]	5

Curriculum Total *16*

1 Refer to department or curriculum guide for course options.

Interdisciplinary Program in Biotechnology

www.ag.ndsu.nodak.edu/plantsci

Biotechnology is an interdisciplinary field based on a combination of biology and technology. It includes the application of science and technology to the design of new plants, animals, and microorganisms that have improved characteristics. For further information, refer to the Interdisciplinary Programs section of this Bulletin for more information.

Department of Cereal and Food Sciences

www.ndsu.edu/cereal-science

Food Science Major

The Food Science major is offered through the Department of Cereal and Food Sciences in the College of Agriculture, Food Systems, and Natural Resources. It is designed to prepare students for a career in the food industry, the "world's largest industry," which is responsible for feeding the world.

The program is structured to develop an understanding of the nature, properties, and characteristics of foods through foundation courses in biochemistry, chemistry, microbiology, physics, and other sciences. Food science courses are built on this foundation. Applications include the study of food safety, processing, preservation, sanitation, storage, and marketing of foods. The analysis and microbiological and biochemical characterization of food products also are studied. Additional elective courses in economics and business administration are available to students intending to enter a management career.

Note: Transfer credits in food science from other institutions must have grades of C or better to be accepted for the food science program at NDSU. The Institute of Food Technologists (IFT) approves the curriculum in the food science program. Students majoring in food science, therefore, are eligible to compete for the prestigious IFT scholarships.

The program also provides the opportunity to gain industrial experience during undergraduate study by means of industry internships. Upon completion of the program, graduates will be able to recognize, critically analyze, and solve problems realistically in both industrial and academic environments.

Sample '08-09 Curriculum
Food Science Major

General Education Requirements	Credits
First Year Experience (F):	
AGRI 189, Skills for Academic Success	1
Communications (C):	
COMM 110, Fund of Public Speaking	3
ENGL 110[1], 120, College Comp I, II	3,3
ENGL Upper Level Writing Course[2]	3
Quantitative Reasoning (R):	
STAT 330, Intro Stats	3
Science & Technology (S):	
BIOL 150, Gen Biology I	3
CHEM 121, 121L, Gen Chemistry I, Lab	3,1
CSCI 114, Microcomputer Applications or	
CSCI 116, Busn Use of Computers	3 or 4
Humanities & Fine Arts (A)	6
Social & Behavioral Sciences (B)	6
Including: ECON 201, Prin of Microeconomics	
Wellness (W):	
HNES 250, Nutrition Science	3
Cultural Diversity (D)[3]	--
Global Perspective (G)	--
ECON 201, Prin of Microeconomics	
Total	***40***

Major Requirements	Credits
AGRI 150, Agricultural Orientation	1
ANSC 340, Meat Science & Technology	3
ABEN 263, Biological Materials Processing	3
CFS 210, Intro to Food Sci & Tech	2
CFS 370, Food Processing I	3
CFS 450, Cereal Technology	3
CFS/MICR 453, Food & Dairy Microbiology	3
CFS 460, 461, Food Chemistry, Lab	3,1
CFS 464, Food Analysis	3
CFS 470, 471, Food Processing II, Lab	3,1
CFS 474, Sensory Science	2
CFS 480, Food Product Development	3
SAFE/CFS/AGED 452, Food Laws & Regul	3
Total	***37***

Related Requirements	Credits
BIOC 460, Biochemistry	4
CHEM 122, 122L, General Chemistry II, Lab	3,1
CHEM 341, 341L, Organic Chemistry I, Lab	3,1
MATH 146, Applied Calculus I or	
MATH 165, Calculus I	4
MICR 350, 350L, General Microbiol, Lab	3,1
PHYS 211, 211L, College Physics I, Lab	3,1
Total	***24***

Additional Requirements	Credits
Free Electives (for degree completion)	26-27
Total	***26-27***

Curriculum Total ***128***

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2 Refer to department or curriculum guide for course options.

3 May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech. Gen Ed courses.

Great Plains Institute of Food Safety

www.ndsu.edu/foodsafety

Food Safety (SAFE) Major

A number of undergraduate and graduate programs of study are offered through the Great Plains Institute for Food Safety. Food safety is an area of concern for many Americans, the current target of tremendous interest, effort, and spending worldwide, and an area in which shortages of expertise are manifest. For further information, refer to the Interdisciplinary Programs section of this Bulletin.

School of Natural Resource Sciences

www.ndsu.edu/nrs

The increasing global population and greater demand made on our renewable resources, has created a need for prepared graduates In natural resource management and environmental science. The School of Natural Resource Sciences is designed to prepare students for challenging careers in examining and solving complex ecological issues locally and globally. Degrees can be obtained in the areas of Entomology, Natural Resources Management, Range Science, and Soil Science.

Entomology

www.ndsu.edu/entomology

Entomology, or the study of insects, provides a wide array of topics to study. The number of insect species outnumbers all other animal groups combined and affects humans, plants, animals, and the environment in a multitude of ways, some good, some bad. Many insect species attack our crops and our domestic animals, often vectoring diseases along with the physical damage they cause. Many species are beneficial in providing food (e.g. honey), pollination services, and many are biological control agents for noxious weeds and other insect pests. Areas of study within entomology range from the very basic (systematics and conservation ecology) to the very applied (insect pest management of regional crops). Professional career opportunities include positions within academia, private research companies, the government, and conservation organizations. The Entomology Department at NDSU does not offer a formal undergraduate degree, but several courses (General Entomology, Crop Entomology, Horticulture Entomology, and Introduction to Insect Ecology) are available to interested students. Graduate programs emphasize a core curriculum (Ecology, Morphology, Physiology, and Systematics), and agricultural courses (Biological Control, Host Plant Resistance, and Insect-Pest Management).

Natural Resources Management

www.ag.ndsu.nodak.edu/nrm

With increasing human pressure and a growing need to balance competing demands, our world needs new and better ways to manage society's impacts on the environment. Natural Resources Management (NRM) is dedicated to preparing students for challenging careers requiring the holistic ecological perspective and global sociological perspective necessary for examining and solving complex natural resource management problems. A major in Natural Resources Management is offered in collaboration with a number of academic departments and colleges on campus. For further information, refer to the Interdisciplinary Programs section.

Range Science

www.ag.ndsu.edu/range

Range Science is a unique program that blends science and management for the purpose of sustaining rangelands. Rangelands are important for the diverse array of products and services they provide. Rangelands are important for ranching, wildlife, water, and recreation to name a few. Rangelands comprise over 40% of the earth's land and include grasslands, prairies, savannahs, shrublands, deserts, meadows, marshes, wetlands, alpine, arctic, and some types of forests. Rangelands are comprised mainly of native grasses, forbs, and shrubs which are extremely productive and rich in biodiversity.

Just as rangelands are diverse, so too are the careers available in rangeland management. Professional career options for rangeland managers are in private and public land management, scientists, educators, ranching, wildlife and fisheries, hydrology and economics. The majority of graduates in Range Science find employment with state and federal agencies as range conservationists with the USDA Forest Service, Natural Resources Conservation Service, Bureau of Land Management, U.S. Fish and Wildlife Service. Bureau of Indian Affairs, National Park Service, State Land Department, State Health Department, universities and others. Career tracks in agribusiness and non-profit organizations are also possible. Students in the Range Science program will take courses in Animal Science, biology, botany, chemistry, economics, natural resources management, plant sciences, soil science, statistics, zoology, as well as the requirements for general education.

Sample '08-09 Curriculum
Range Science Major

General Education Requirements	Credits
First Year Experience (F):	
AGRI 189, Skills for Academic Success	1
Communications (C):	
COMM 110, Fund of Public Speaking	3
ENGL 110[1], 120, College Comp I, II	3,3
ENGL Upper Level Writing Course[2]	3
Quantitative Reasoning (R):	
STAT 330, Intro Stats	3
Science & Technology (S):	
CHEM 121, 121L, Gen Chemistry I, Lab	3,1
PLSC 110, World Food Crops	3
PLSC 315, Genetics	3
Humanities & Fine Arts (A)	6
Social & Behavioral Sciences (B)	6
Including: ECON 201, Prin of Microeconomics	
Wellness (W)	2
Cultural Diversity (D)[3]	--
Global Perspective (G)	--
ECON 201, Prin of Microeconomics	
Total	***40***

Major Requirements	Credits
AGRI 150, Ag Orientation	1
ANSC 114, Intro to Animal Science	3
ANSC 123, Feeds & Feeding or	
ANSC 220, Livestock Production	3
BIOL 151, 151L, Gen Biology II, Lab	3,1
BOT 314, Systemic Botany	3
BOT 380, Plant Physiology	3
CHEM 260, Elements of Biochemistry	4
MATH 103, College Algebra	3
PLSC 219, Intro Prairie & Comm Forestry or	
PLSC 320, Prin of Forage Production or	
PLSC 323, Prin of Weed Science	2 or 3
RNG 225, Natural Resource & Agro-Ecosys	3
RNG 336, Intro to Range Science	3
RNG 450, Range Plants	3

RNG 452, GIS in Range Survey.....3
RNG 453, Rangeland Res & Watersh Mgmt or
RNG 454, Wetland Resource Mgmt.....3
RNG 456, Range Habitat Mgmt or
RNG 458, Grazing Ecology.....3
RNG 460, Plant Ecology.....3
RNG 462, Rangeland Planning & Analysis.....3
RNG 491, Seminar.....1
SOIL 210, Intro to Soil Science.....3
SOIL 217, Intro to Meteor & Climatology or
SOIL 351, Soil Ecology or
SOIL 410, Soils & Land Use.....3
SOIL 444, Soil Genesis & Survey.....4
ZOO 475, Conservation Biology or
ZOO 476, Wildlife Ecology & Mgmt.....3
Total ***64-65***

Additional Requirements	**Credits**
Free Electives (for degree completion)	23-24

Curriculum Total ***128***

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2 Refer to department or curriculum guide for course options.

3 May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech. Gen Ed courses.

Sample '08-09 Curriculum
Range Science Minor

Requirements	**Credits**
RNG 225, Natural Resource & Agro-Ecosys	3
RNG 336, Intro to Range Management	3
RNG 450, Range Plants	3
RNG 452, GIS in Range Survey or RNG 453, Rangeland Res & Watersh Mgmt or RNG 460, Plant Ecology	3
RNG 456, Range Habitat Mgmt or RNG 458, Grazing Ecology	3
RNG Electives (min)	1
Curriculum Total	***16***

Soil Science

www.soilsci.ndsu.nodak.edu

Soil Science is a field-oriented discipline that defines, investigates, and utilizes the most important of our natural resources, safe air and clean water. All terrestrial life depends upon the soil for food and clean water. Knowledge of soil science is critical to address environmental problems, such as wetland protection, habitat restoration, and waste disposal, and it is vital to ensure sustainability of agricultural and forest products. Soil expertise is also essential in the emerging fields of urban and sustainable agriculture. Soils are complex and constantly evolving natural systems, hence the curriculum accentuates physical, biological, and earth sciences. A soil science degree prepares a student with the training to enter careers in both traditional agriculture and the environmental sectors, including: environmental consulting, soil conservation and resource management, production agriculture, and state and federal regulatory agencies. All majors in Soil Science must meet the following requirements:

Sample '08-09 Curriculum
Soil Science Major

General Education Requirements	**Credits**
First Year Experience (F):	
AGRI 189, Skills for Academic Success	1
Communications (C):	
COMM 110, Fund of Public Speaking	3
ENGL 110[1], 120, College Comp I, II	3,3
ENGL Upper Level Writing Course[2]	3
Quantitative Reasoning (R):	
STAT 330, Intro Stats	3
Science & Technology (S):	
BIOL 150, Gen Biology I	3
CHEM 121, 121L, Gen Chemistry I, Lab	3,1
PLSC 110, World Food Crops	3
Humanities & Fine Arts (A)	6
Social & Behavioral Sciences (B)	6
Wellness (W)	2
Cultural Diversity (D)[3]	--
Global Perspective (G)	--
PLSC 110, World Food Crops	
Total	***40***

Major Requirements	**Credits**
AGRI 150, Ag Orientation	1
SOIL 210, Intro Soil Science	3
SOIL 217, Intro to Meteorology & Climatology	3
SOIL 322, Fertility & Fertilizer	3
SOIL 351, Soil Ecology	3
SOIL 410, Soils & Land Use	3
SOIL 433, Soil Physics	3
SOIL 444, Soil Genesis & Survey	4
SOIL 480, Soils & Pollution	3
SOIL 491, Capstone Seminar I, II	1,1
ASM 264, Natural Resource Mgt Sys	3
Total	***31***

Related Requirements	**Credits**
BOT 380, 380L, Plant Physiology, Lab	3,1
CHEM 122, 122L, Gen Chemistry I, Lab	3,1
CHEM 240, Survey of Organic Chem or CHEM 341, Organic Chemistry I or CHEM 431, 431L, Analytical I, Lab	3 or 3,2
GEOG 455, Intro to Geographic Info Sys or RNG 452, GIS Range Survey	3
GEOL 105, 105L, Physical Geology, Lab	3,1
MATH 103, College Algebra	3
MATH 146, Applied Calc I or MATH 165, Calculus I	4
MICR 202, 202L, Intro Microbiology, Lab or MICR 350, 350L, General Microbiology I	2,1 or 3,1
PHYS 211, 211L, College Physics I, Lab	3,1
PHYS 212, 212L, College Physics II, Lab	3,1
PLSC 225, Prin of Crop Production or RNG 336, Intro to Range Mgmt	3
Agriculture Electives[2]	9
Electives (for degree completion)	6-9
Total	***48-51***

Curriculum Total ***128***

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2 Refer to department or curriculum guide for course options.

3 May double count with select Humanities & Fine Arts, Social & Behavioral Science, and/or Science & Tech. Gen Ed courses.

Sample '08-09 Curriculum
Soil Science Minor

Requirements	**Credits**
SOIL 210, Intro Soil Science	3
SOIL 351, Soil Ecology	3
SOIL 444, Soil Genesis & Survey	4
SOIL Electives[1]	6
Curriculum Total	***16***

1 Refer to department or curriculum guide for course options.

Note: A minimum of eight credits must be taken at NDSU.

Department of Plant Sciences

www.ag.ndsu.nodak.edu/plantsci

Crop and Weed Sciences Major

Instruction in crop and weed sciences includes field and forage crop production and management, weed science, general and plant genetics, plant breeding, experimental design, and biotechnology. The study of botany and other plant sciences, entomology, plant pathology, and soil science is basic or related to crop and weed sciences. Students may obtain either a major or minor. The Crop and Weed Sciences major or minor is intended for general use in sales, research, and technical services (crop consultant) of agribusinesses involved in seed, chemical, and other plant production and management aspects; in natural resources conservation service; by those interested in production agriculture; or as a prerequisite for graduate study.

Major

Majors must meet all of the following requirements including courses in supporting disciplines.

Sample '08-09 Curriculum
Crop & Weed Sciences Major

General Education Requirements	**Credits**
First Year Experience (F):	
AGRI 189, Skills for Academic Success	1
Communications (C):	
COMM 110, Fund of Public Speaking	3
ENGL 110[1], 120, College Comp I, II	3,3
ENGL Upper Level Writing Course[2]	3
Quantitative Reasoning (R):	
STAT 330, Intro Stats	3
Science & Technology (S)	10
(fulfilled with major/option requirements)	
Humanities & Fine Arts (A)	6
Social & Behavioral Sciences (B)	6
Including: ECON 201, Prin of Microeconomics	
Wellness (W)	2
Cultural Diversity (D)[3]	--
Global Perspective (G)	--
ECON 201, Prin of Microeconomics	
Total	***40***

Major/Related Requirements (all options)	**Credits**
AGRI 150, Ag Orientation	1
BIOL 150, 150L, Gen Biology I, Lab	3,1
BIOL 151, 151L, Gen Biology II, Lab, or BOT 372, Structure/Div/Plants/Fungi	3,1 or 4
CHEM 121, 121L, Gen Chem I, Lab	3,1
CHEM 122, 122L, Gen Chem II, Lab	3,1
ENT 350, General Entomology	5
PLSC 110, World Food Crops	3
PLSC 215, Weed Identification	1
PLSC 225, Principles of Crop Production	3
PLSC 491, Sophomore Seminar	1
PLSC 315, 315L, Genetics, Lab	3,1
PLSC 320, Prin of Forage Production	3
PLSC 323, Prin of Weed Science	3
PLSC 446, Genetics & Plant Improvement	3
PLSC 455, Cropping Systems	3
PLSC 491, Senior Seminar	1
PPTH 324, Intro Plant Pathology	3
SOIL 210, Intro to Soil Science	3
Electives (for degree completion)	--
Total	***53***

Options (choose one)

Option 1: Production	Credits
MICR 202, 202L, Intro Microbiology, Lab	2,1
BOT 380, Plant Physiology or	
ANSC 323, Fundamentals of Nutrition	3
CHEM 240, Survey of Organic Chem or	
CHEM 260, Elements of Biochemistry	3 or 4
MATH 103, College Algebra	3
PLSC 300-400 Level Electives[2]	4
Total	*16-17*

Option 2: Weed Science	Credits
MICR 202, 202L, Intro Microbiology, Lab	2,1
AGEC 375, Applied Agricultural Law or	
BUSN 431, Business Law I.	3
BOT 380, Plant Physiology	3
CHEM 240, Survey of organic Chem or	
CHEM 260, Elements of Biochemistry	3 or 4
MATH 103, College Algebra	3
PLSC 453, Adv Weed Science	2
PLSC 300-400 Level Electives[2]	2
PPTH 454, Diseases of Field & Forage Crops	3
Total	*22-23*

Option 3: Biotechnology	Credits
BIOC 460, Found Biochem & Molec Bio I	4
BOT 380, 380L, Plant Physiology, Lab	3,1
Math 105, Trigonometry or	
MATH 146, Applied Calc I.	3 or 4
MICR 350, 350L, Gen Microbiology I, Lab.	3,1
PLSC 453, Adv Weed Science or	
PLSC 431, Intermediate genetics	2 or 3
PLSC 484, Plant Tissue, Cult & Microprop	2
Total	*19-21*

Option 4: Science	Credits
MICR 202, 202L, Intro Microbiology, Lab	2,1
BOT 380, 380L, Plant Physiology, Lab	3,1
CHEM 341, 341L, Organic Chem I, Lab	3,1
MATH 146, Applied Calc I	4
PLSC 300-400 Level Electives[2]	4
Science/Math Electives[2]	12
Total	*31*

Addtional Requirements (varies with option)	Credits
Free Electives (for degree completion)	4-19
Total	*4-19*

Curriculum Total (All Options) *128*

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2 Refer to department or curriculum guide for course options.

3 May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech. Gen Ed courses.

Curriculum Options

Students may select one of the following options within Crop and Weed Sciences.

Agribusiness: Students interested in a business career in crop and weed sciences should consider the Agribusiness minor offered through the Department of Agribusiness and Applied Economics.

Biotechnology: This option is intended for students who wish to work in the biotechnology industry or pursue graduate study in the crop biotechnology area. Students must complete BIOC 460, BOT 380, 380L, MICR 350, 350L (instead of MICR 202, 202L), plus MATH 105 or 146, and PLSC 431 or 453, and PLSC 484. Students interested in biotechnology also may pursue the interdisciplinary Biotechnology major (see Interdisciplinary Programs section).

Production: This option is for students most interested in production agriculture. This is the most popular option with students and provides the most flexibility of course selection. Completing the basic crop and weed sciences curriculum fulfills this option.

Science: This option is intended for students who are interested in graduate studies and want more basic science courses as a foundation for graduate studies. BOT 380, 380L, CHEM 341, 341L, and MATH 146 must be taken under the general basic and applied sciences requirements, plus 12 credits of science electives from outside the agriculture field. Suggested electives are: BIOC 460, 461, BOT 314, 460, CHEM 342, MATH 147, PHYS 211, 212, or STAT 331.

Weed Science: This option is intended for students interested in crop consulting, weed science, or integrated pest management. AGEC 375 or BUSN 431, BOT 380, PLSC 453, and PPTH 454 are required. ASM 378, BOT 314, PLSC 210, 211, and SOIL 322 are suggested electives.

Special Opportunities

Agronomy Club: The Agronomy Club meets twice each month. Members join in campus and community activities, arrange speakers on agricultural topics, and participate in meetings and contests at the regional and national levels. The club also coordinates tours to local agribusinesses to gain a better perspective of career opportunities. Students with an interest in agriculture are encouraged to attend, regardless of chosen major.

Crop and Weed Sciences Minor

Students may minor in Crop and Weed Sciences by selecting a total of 18 credits of study in crop and weed sciences or closely related fields, including PLSC 110, 225, two courses from 315 and 315L, 320, or 323, plus a minimum of five credits approved by the department. A minimum of 8 credits must be taken at NDSU, and at least six credits must be at the 300-400 level.

Sample '08-09 Curriculum
Crop & Weed Sciences Minor

Requirements	Credits
PLSC 110, World Food Crops	3
PLSC 225, Principles of Crop Production	3
PLSC Electives[1]	12
Curriculum Total	*18*

1 Refer to department or curriculum guide for course options.

Horticulture Major

Instruction and study in horticulture is focused on fruits, vegetables, turfgrass, and woody and herbaceous landscape plants, including propagation, production, culture, marketing, processing, and utilization. Horticulture encompasses the design and planting for landscapes, parks, highways, and public facilities, including interiorscapes, in rural, suburban, and urban areas. It includes skills for management of nursery, garden center, greenhouse, seed, fruit, vegetable, turfgrass, biotechnology, and specialty crop enterprises, as well as floral design and flower shops.

The Horticulture major is a four-year curriculum leading to the B.S. degree. Students also may minor in Horticulture. Prospective students should consult with horticulture faculty regarding programs and options so their educational needs may best be fulfilled. Master of Science and Ph.D. degree programs also are available. For more complete details, see the Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin.

Curriculum Options

Horticulture majors may select one or more options of study. All of the requirements for the major and the supporting disciplines must be met to complete any horticulture option. Students may select from the following five options.

Horticulture Biotechnology: This option is for students who plan to engage in laboratory research or further their education in the biotechnology of horticultural crops.

Horticulture Science: This option is for students who plan to continue formal graduate school education leading to careers in research, teaching, and extension.

Landscape Design: This option is for students interested in planning, designing, and installing landscape plantings for functional and aesthetic purposes (a 16-credit minor in landscape architecture is required).

Production Business: This option is for students who wish to grow, market, and process horticultural crops, for example, nursery and/or greenhouse landscape, fruit, and vegetable crops.

Urban Forestry and Parks: This option is for students who desire a career in the management of urban forests and park-like areas, including arboreta and botanic gardens. It also includes maintenance of residential landscapes.

Special Opportunities

Pre-Forestry: A student who desires to major in forestry may select a two-year pre-forestry curriculum. However, the forestry student must transfer to another institution to complete degree requirements.

Horticulture and Forestry Club: This club meets monthly. Members take field trips to botanical gardens, arboreta, trade shows, parks and other horticultural sites. They also are actively involved in growing and marketing flowers and foliage plants, regional and national judging contests, flower shows, and horticulture science and education programs.

Sample '08-09 Curriculum
Horticulture Major

General Education Requirements	Credits
First Year Experience (F):	
AGRI 189, Skills for Academic Success	1
Communications (C):	
COMM 110, Fund of Public Speaking	3
ENGL 110[1], 120, College Comp I, II	3,3
ENGL Upper Level Writing Course[2]	3
Quantitative Reasoning (R):	
STAT 330, Intro Stats	3
Science & Technology (S):	
CHEM 121, 121L, Gen Chemistry I, Lab	3,1
CHEM 122, Gen Chemistry II	3
CSCI 114, Microcomputer Pkgs or	
CSCI 116, Busn Use of Computers	3 or 4
Humanities & Fine Arts (A)	6
Social & Behavioral Sciences (B)	6
Including: ECON 201, Principles of Microecon or	
ECON 202, Principles of Macroecon	
Wellness (W)	2
Cultural Diversity (D)[3]	--
Global Perspective (G)	--
ECON 201, Principles of Microecon	
Total	*40*

Major/Related Requirements	Credits
AGRI 150, Ag Orientation	1
BIOL 150, 150L, Gen Biology I, Lab	3,1
ENT 350, General Entomology	5
PLSC 210, 211, Horticulture Science, Lab	3,1
PLSC 315, Genetics	3
PLSC 355, Woody Land Plants	3
PLSC 455, Cropping Systems	3
PLSC 491, Hort Seminar	1
PPTH 324, Intro Plant Pathology	3
Free Electives (for degree completion)	--
Total	*27*

Options (choose one)

Option 1: Horticulture Biotechnology	Credits
BIOC 460, Found Biochem & Molec Bio I	4
BIOC 461, Found Biochem & Molec Bio II	4
BIOC 474, Meth of Recombinant DNA Tech	3
BOT 372, Struc/Div/Plants & Fungi	4
BOT 380, 380L, Plant Physiology, Lab	3,1
CHEM 341, 341L, Organic Chemistry I, Lab	3,1
CHEM 342, Organic Chemistry II	3
MATH 146, Applied Calc I	4
MICR 202, 202L, Intro Microbiology, Lab	2,1
PLSC 315L, Genetics Lab	1
PLSC 360, Hort Food Crops	4
PLSC 368, Plant Propagation	3
PLSC 484, Plant Tissue, Cult &Microprop	2
PLSC 486, Eco-Physiology of Hort Crops	2
MATH 103, College Algebra or higher	3
PLSC Electives[2]	4
Total	*52*

Option 2: Horticulture Science	Credits
BOT 372, Struc/Div/Plants & Fungi	4
BOT 380, 380L, Plant Physiology, Lab	3,1
CHEM 260, Elements of Biochemistry	4
CHEM 341, 341L, Organic Chemistry I, Lab	3,1
MATH 103, College Algebra	3
MATH 146, Applied Calc I	4
PHYS 120, Fund of Physics	3
PLSC 315L, Genetics Lab	1
PLSC 323, Prin of Weed Science	3
PLSC 360, Horticulture Food Crops	4
PLSC 368, Plant Propagation	3
PLSC 484, Plant Tissue, Cult & Microprop	2
PLSC 486, Eco-Physiology of Hort Crops	2
SOIL 210, Intro to Soil Science	3
PLSC Electives[2]	4
Total	*48*

Option 3: Landscape Design	Credits
BOT 380, Plant Physiology	3
BOT 460, Plant Ecology	3
BUSN 431, Business Law I	3
MATH 103, College Algebra	3
PLSC 177, Floral Design	2
PLSC 323, Prin of Weed Science	3
PLSC 341, Land Bidding & Contracting	1
PLSC 365, Herb Land Plants	2
PLSC 375, Turfgrass Management	3
PLSC 465, Adv Landscape Plants	2
PLSC 485, Arboriculture Science	3
PPTH 456, Forest & Shade Tree Pathology	3
SOIL 210, Intro to Soil Science	3
PLSC Electives[2]	2
Total	*36*

Option 4: Production – Business	Credits
ACCT 102, Fund of Accounting	3
BOT 372, Struc/Div/Plants & Fungi	4
BOT 380, Plant Physiology	3
BUSN 350, Foundations of Mgmt	3
BUSN 450, Human Resource Mgt	3
MATH 103, College Algebra	3
PLSC 315L, Genetics Lab	1
PLSC 323, Prin of Weed Science	3
PLSC 360, Horticulture Food Crops	4
PLSC 368, Plant Propagation	3
PLSC 412, Nursery Prod & Mgmt	3
PLSC 422, Greenhouse Prod & Mgmt	3
PLSC 486, Eco-Physiology of Hort Crops	2
PPTH 455, Plant Disease Mgmt or PPTH 456, Forest & Shade Tree Pathology	3
SOIL 210, Intro to Soil Science	3
Recommended PLSC Electives[2]	--
Total	*44*

Option 5: Urban Forestry & Parks	Credits
BOT 372, Struc/Div/Plants & Fungi	4
BOT 380, Plant Physiology	3
BOT 460, Plant Ecology	3
BUSN 350, Foundations of Mgmt	3
HNES 426, Parks & Recreation Admin	3
LA 351, Landscape Design	3
MATH 103, College Algebra	3
NRM 150, Nat Resources Mgmt Orientation	1
PLSC 219, Intro to Prairie & Comm Forestry	2
PLSC 315L, Genetics Lab	1
PLSC 323, Prin of Weed Science	3
PLSC 365, Herb Land Plants	2
PLSC 375, Turfgrass Management	3
PLSC 465, Adv Landscape Plants	2
PLSC 485, Arboriculture Science	3
PLSC 486, Eco-Physiology of Hort Crops	2
POLS 360, Prin of Public Administration	3
PPTH 456, Forest & Shade Tree Pathology	3
SOIL 210, Intro to Soil Science	3
PLSC Electives[2]	1
Total	*51*

Addtional Requirements (varies with option)	Credits
Free Electives (for degree completion)	9-25
Total	*9-25*

Curriculum Total (All Options) *128*

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2 Refer to department or curriculum guide for course options.

3 May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech. Gen Ed courses.

Sample '08-09 Curriculum Horticulture Minor

Requirements	Credits
PLSC 210, 211, Horticulture Science, Lab	3,1
PLSC Electives[1]	14
Curriculum Total	*18*

1 Refer to department or curriculum guide for course options.

Sample '08-09 Curriculum Two-Year Pre-Forestry

First Year	Credits
AGRI 150, Ag Orientation	1
AGRI 189 Skills for Academic Success	1
BIOL 150,150L General Biology I/Lab or BIOL 151, 151L General Biology II/Lab	3,1
BOT 372, Struc & Div of Plants & Fungi	4
CHEM 121, 121L, Gen Chem I, Lab	3,1
CHEM 122, Gen Chem II	3
ECON 201, Prin Microeconomics	3
ENGL 110[1], 120, College Composition I,II	3,3
MATH 103, 105, or above, College Alg, Trig	3,3
Wellness	2
Total	*34*

Second Year	Credits
COMM 110, Fund of Public Speaking	3
CSCI 114, Microcomputer Packages or CSCI 116, Business Use of Computers	3 or 4
ENT 350, General Entomology	5
PHYS 120, Fund Physics	3
PLSC 219, Intro to Prairie & Comm Forestry	2
PLSC 355, Woody Landscape Plants	3
PLSC 315, 315L, Genetics, Lab	3,1
SOIL 210, Intro Soil Science	3
Soc Sci, Hum & Fine Arts Electives	6
Total	*32-34*

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

Sports and Urban Turfgrass Management Major

The Sports and Urban Turfgrass Management program focuses on science and technology for the management of quality turf in such areas as golf courses, sports facilities, parks, and home lawns. A graduate should be competent in grass physiology, soil science, proper irrigation practices, pest control, budgeting of resources, and personnel management. Graduates may work in the turf industry, which encompasses not only turf managers, but also the production of seed, sod or other turfgrass materials, manufacturing and marketing of products for turf management, business management, manpower development, consulting, and other services.

The Sports and Urban Turfgrass Management major is a four-year curriculum leading to a B.S. degree. Students have the opportunity to minor in other programs of interest.

Sample '08-09 Curriculum Sport & Urban Turfgrass Management Major

General Education Requirements	Credits
First Year Experience (F):	
AGRI 189, Skills for Academic Success	1
Communications (C):	
COMM 110, Fund of Public Speaking	3
ENGL 110[1], 120, College Comp I, II	3,3
ENGL Upper Level Writing Course[2]	3
Quantitative Reasoning (R):	
STAT 330, Intro Statistics	3
Science & Technology (S):	
BIOL 150, 150L, Gen Biology I, Lab	3,1
CHEM 121, 121L, Gen Chemistry I, Lab	3,1
CHEM 122, Gen Chemistry II	3
Humanities & Fine Arts (A)	6
Social & Behavioral Sciences (B)	6
Including: ECON 201, Prin of Microeconomics or ECON 202, Prin of Macroeconomics	
Wellness (W)	2
Cultural Diversity (D)[3]	--
Global Perspective (G)	--
ECON 201, Prin of Microeconomics or ECON 202, Prin of Macroeconomics	
Total	*41*

Major Requirements	Credits
PLSC 210, 211, Horticulture Sci, Lab	3,1
PLSC 315, 315L Genetics, Lab	3,1
PLSC 323, Prin of Weed Science	3
PLSC 341, Land Bid & Contracting	1
PLSC 375, Turfgrass Management	3
PLSC 381, Sports Turf Operations	3
PLSC 457, Turfgrass Sci, Ecol/Mgmt (capst.)	3
PLSC 468, Golf Course Irrigation I	2
PLSC 469, Golf Course Irrigation II	1
PLSC 491, Seminar	1
PLSC 496, Field Experience	2
Total	*27*

Related Requirements	Credits
AGRI 150, Ag Orientation	1
ACCT 102, Fund of Accounting	3
AGEC 242, Intro to Ag Mgmt or AGEC 244, Ag Mgmt	4 or 3
BOT 380, Plant Physiology	3
ENT 350 , General Entomology	5
MATH 103, College Algebra	3
PPTH 324, Intro Plant Pathology	3
SOIL 210, Intro to Soil Science	3
SOIL 322, Soil Fert & Fertilizers	3
PLSC Electives[2]	5
Total	*32-33*

Additional Requirements	Credits
Free Electives (for degree completion)	27-28
Total	*27-28*

Curriculum Total *128*

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2 Refer to department or curriculum guide for course options.

3 May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech. Gen Ed courses.

Turf Club: The goals of the Turf Club are to provide students with opportunities to share information, connect with the turf industry, gain real world experience, and broaden their knowledge. The club organizes field trips, topic discussions, and presentations by guest speakers. Other activities include attending regional and national turf conferences, community service, and fundraising.

Department of Veterinary and Microbiological Sciences

http://vetmicro.ndsu.nodak.edu/

This department offers instruction in microbiology, including courses in general microbiology, pathogenic microbiology, parasitology, virology, immunology, food microbiology, microbial physiology and bacterial genetics. The department also offers courses in epidemiology, animal disease, and food safety to enhance our students' understanding of applied microbiology and infectious disease.

Microbiology Major

Microbiology is a fundamental biological science which offers a variety of challenges and opportunities. Microbiologists have made some of the most important scientific discoveries in this century. Since 1910, approximately one-third of the Nobel Prizes in medicine and physiology have been awarded to microbiologists. The discipline covers a wide spectrum of specialized interest areas that illustrate how microbes affect human and animal health, our environment, food safety, food technology, and the biotechnology industry. In recent years, the field of microbiology has had a major impact upon virtually all other scientific disciplines. For this reason, even students who choose to major in other fields may benefit from a minor in microbiology.

Students majoring in microbiology are well prepared to enter graduate school, veterinary school, and medical school, or to establish careers in food or pharmaceutical industries, hospitals, public health agencies, universities, research laboratories, and other biomedical industries. A 2.50 institutional grade point average and a minimum grade of C in core and elective microbiology courses are required to remain in the Microbiology major.

Sample '08-09 Curriculum Microbiology Major

General Education Requirements	Credits
First Year Experience (F):	
AGRI 189, Skills for Academic Success	1
Communications (C):	
COMM 110, Fund of Public Speaking	3
ENGL 110[1], 120, College Comp I, II	3,3
MICR 354, Scientific Writing	3
Quantitative Reasoning (R):	
STAT 330, Intro Statistics	3
Science & Technology (S):	
BIOL 150, 150L, Gen Biology I, Lab	3,1
CHEM 121, 121L, Gen Chemistry I, Lab	3,1
Phys 211, 211L, College Physics I, Lab	3,1
Humanities & Fine Arts (A)	6
Social & Behavioral Sciences (B)	6
Wellness (W)	2
Cultural Diversity (D)[2]	--
Global Perspective (G)	--
Total	*42*

Major Requirements	Credits
MICR 350, 350L, Gen. Microbiology I, Lab	3,1
MICR 460, 460L, Pathogenic Micro, Lab	3,2
MICR 470, Basic Immunology	3
MICR 471, Immunology & Serology Lab	2
MICR 475, Animal Virology	3
MICR 480, Bacterial Physiology	3
MICR 482, Bacterial Genetics & Phage	3
MICR 486, Capstone Experience	3
MICR Electives[3]	7
Total	*33*

Related Requirements	Credits
AGRI 150, Ag Orientation	1
BIOC 460, Fund of Biochem & Molec Biol I	4
BIOC 461, Fund of Biochem & Molec Biol II	4
BIOL/BOT/ZOO Elective[3]	3
CHEM 122, 122L, Gen Chemistry II, Lab	3,1
CHEM 341, 341L, Organic Chem I, Lab	3,1
CHEM 342, Organic Chem II	3
MATH 103, College Algebra & MATH 105, Trigonometry or MATH 146, Applied Calc I	3,3 or 4
Phys 212, 212L, College Physics II, Lab	3,1
PLSC 315, 315L, Genetics	3,1
Total	*35-37*

Additional Requirements	Credits
Free Electives (for degree completion)	16-18
Total	*16-18*

Curriculum Total *128*

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2 May double count with select Humanities & Fine Arts, Social & Behavioral Science, and/or Science & Tech. Gen Ed courses.

3 Refer to department or curriculum guide for course options.

Sample '08-09 Curriculum Microbiology Minor

Requirements	Credits
MICR 350, 350L, Gen. Microbiology I, Lab	3,1
MICR Elective[1]	3
MICR 300-400 Level Electives[1]	9-10

Curriculum Total *16-17*

1 Refer to department or curriculum guide for course options.

Pre-Veterinary Medicine

NDSU offers excellent programs that prepare students for application to a college of veterinary medicine. All veterinary schools stress the importance of high scholastic standing and judge applicants on academic preparation, knowledge of the veterinary profession, experience and character.

Because the number of students admitted to veterinary schools is limited, prospective students should check the specific requirements of the college of their choice well in advance to make certain that preparatory work is appropriate.

Pre-veterinary medicine is not a specific major, and students are encouraged to pursue a major in their area of interest while at NDSU. In addition, students preparing for application to a veterinary school should consult with a pre-veterinary medicine advisor. The department is a member of the Association of American Veterinary Medical Colleges (AAVMC), which administers the Veterinary Medical College Application Service (VMCAS). Communication with pre-veterinary students is facilitated when students are enrolled in the College of Agriculture, Food Systems, and Natural Resources. Visit the VMS, Pre-Veterinary Medicine Web site for further information.
http://vetmicro.ndsu.edu/prevet.htm