



**Department of  
Plant Sciences  
Graduate Student Handbook**

*North Dakota State University*



DEPARTMENT OF PLANT SCIENCES



**Agriculture is in our roots**

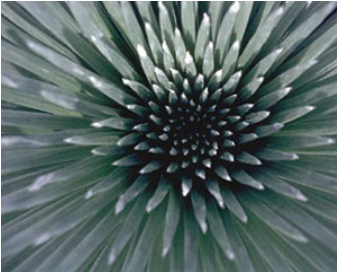
[Student Handbook](#)

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Prospective students may schedule a visit by calling 1-800-488-NDSU.

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## Welcome to North Dakota Home of North Dakota State University

North Dakota is located in the center of the North American continent, and its beautiful landscape is predominantly composed of prairies and plains. Variations in the landscape are found at the southwestern quarter and along the eastern edge of the state. In addition, there are several long escarpments and a few low ranges of hills. The landscape of the southwestern quarter of North Dakota (south and west of the Missouri River) has developed over the past several million years. Rugged badlands are found in this region. In contrast, the landscape of the remaining North Dakota areas was formed by more recent glaciers, as recent as 13,000 years ago. These glaciated areas have a landscape of rolling productive land dotted with wetlands. The Red River Valley, located along the eastern edge of the state is the bottom of a glacial lake, Lake Agassiz. This area is characterized by rich lake-bottom sediment, and sandy beach ridges 20 to 40 miles west of the Red River. As you travel west from Fargo or other eastern points, look for the sudden rise in elevation that signifies the sandy beaches.

About 60% of North Dakota is drained by the Missouri River and its tributaries. This water makes its way to the Mississippi River and finally to the Gulf of Mexico. The other 40% of North Dakota is drained by the Red River of the North and its tributaries, and this water drains north to the Hudson Bay. Elevations range from about 750 feet (230 meters) above sea level at the northeast corner of the state, to about 3500 feet (1065 meters) at White Butte in the southwestern corner of the state.

North Dakota is known affectionately as the "Peace Garden" state and where the buffalo roam. This state is graced by the wild prairie rose (state flower) and the melodious meadowlark (state bird). North Dakota is the home for a wide variety of game and wildlife, and, therefore, also the home of many hunters and photographers. Teddy Roosevelt, our 26th President, entertainers Lawrence Welk, Angie Dickinson, and Peggy Lee, and baseball star Roger Maris all hail from North Dakota. However, it is the hard-working, fun-loving men and women all across the state that have defined North Dakota.

Agriculture is big business in North Dakota. The annual value of agricultural products exceeds \$3 billion. The diversity of crops grown in North Dakota is extensive. Nationally, North Dakota ranks first in production of hard red spring wheat, durum wheat, barley, sunflower, flax, dry edible beans, and oat. North Dakota ranks among the top five states for several other crops.



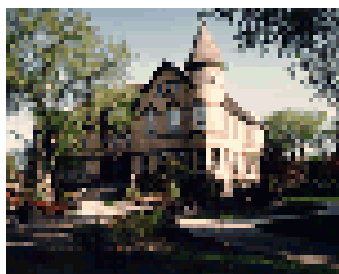
## The Community

Fargo, ND, and Moorhead, MN, lie where Interstate Highways 29 and 94 intersect, about 230 miles northwest of Minneapolis, MN, and the same distance south of Winnipeg, Canada. The two cities, separated by the Red River, are serviced by both Amtrak and air to Minneapolis and Chicago. The community has much to offer as a place to live and study.

Fargo was recently named by Money magazine as one of the most desirable places in the country to live, and it is quietly earning a reputation as a perfect place to make a home. Nestled in the rich farmlands of the Red River Valley, the Fargo-Moorhead community has many qualities that contribute to this reputation, including its highly-respected educational system, advanced medical technology, a progressive business community, numerous cultural and arts opportunities, clean air and water, and good-hearted, friendly people.

With more than 160,000 people in the community and about 500,000 people in the service area, Fargo-Moorhead is the largest metropolitan center between Minneapolis and Seattle. The economy of the area is strong and diverse. Employment is high and offers a broad range of opportunities.

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### **North Dakota State University, NDSU**

North Dakota State University, the state's Morrill Act land-grant institution, is located on the state's eastern border in Fargo, North Dakota's largest city. North Dakota State University strives to be a leader in agriculture, information systems, technology transfer, economic development and lifelong learning, and it encompasses a broad spectrum of curricular offerings, scholarly activity and service. It is one of two major research universities in an 11-institution state university system.

NDSU has enjoyed steady enrollment growth for the past decade. Current enrollment is about 11,000 students on the campus in Fargo. NDSU also serves several thousand people throughout the state in continuing education and extension programs.

Instruction is carried out in nine academic units: the Colleges of Agriculture; Arts, Humanities and Social Sciences; Business Administration; Engineering and Architecture; Human Development and Education; Pharmacy; Science and Mathematics; University Studies and the Graduate School. NDSU has 21 doctoral and professional programs, 41 master's degree programs and 76 bachelor's degree programs. The North Dakota Agricultural Experiment Station and NDSU Extension Service are integral parts of the University. NDSU has approximately 1,500 staff members and 800 faculty and academic staff.

NDSU participates in the Tri-College University consortium with neighboring Moorhead State University (more than 6,500 students) and Concordia College (about 3,000 students). Although NDSU has its own modern library, our participation in the Tri-College University and the Inter-library loan system allows resources at Concordia, Moorhead State, and most universities in the region and beyond to be in your hands without leaving the NDSU campus.

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### **Department of Plant Sciences**

The Department of Plant Sciences (PLSC) offers graduate studies leading to M.S. degrees in Plant Sciences or Horticulture, and to a Ph.D. degree in Plant Sciences. Specialized academic and research training is available in biotechnology, plant breeding and genetics, forestry,

horticulture, physiology, production, and weed science. Additional information can be obtained on our home page at the NDSU website ([WWW.ag.ndsu.nodak.edu/plantsci](http://WWW.ag.ndsu.nodak.edu/plantsci)).

The Department of Plant Sciences is located in Loftsgard Hall, completed in 1991, with modern and well-equipped research laboratories, offices for faculty and graduate students, and state-of-the-art classrooms. Loftsgard Hall, which is part of the Plant Science Complex, provides a sophisticated and user-friendly facility for interdisciplinary research, ranging from basic studies and biotechnology to the more traditional applied sciences. Relatively new greenhouses and extensive growth chamber facilities also are available, as are 150 adjacent acres of field research plots. An additional 500 acres of research plots and a horticultural farm, with an extensive arboretum, are located near the campus.

Excellent supporting departments include Biochemistry, Biological Sciences, Cereal and Food Science, Entomology, Microbiology, Plant Pathology, and Soil Science. The Plant Sciences Department encourages interdisciplinary research, and students usually tailor their research program to meet their interests by working with faculty in one or more of the supporting departments.

The department has a policy of only two to four graduate students assigned to each faculty adviser, so the student gets individualized attention and works closely in research with their adviser. Final selection of the adviser will be made on the basis of the student's interest, availability of space in the researcher's laboratory, and a common desire of the student and professor to work together.

If you are new to North Dakota, we know that you will soon agree that North Dakota State University, Fargo, and the state provide a wonderful place to learn knowledge and skills, experience sincere hospitality, make new friends, and enjoy wonderful, hard-working people. We welcome you!



## General Information

**BULLETIN BOARDS.** Bulletin boards outside of graduate student offices in Loftsgard Hall are for graduate student use. All announcements concerning students will be posted on these boards. A board outside the main office is used for departmental announcements.

**CAR INSURANCE.** Every driver in North Dakota must have "liability" coverage. International students must have a driver's license and "liability" insurance BEFORE driving. If no "liability" coverage is secured, you must be able to show financial responsibility, e.g., \$50,000.00.

**CAR LICENSE.** All drivers must have state, international, or other valid driver's license.

**COMPUTERS.** Ethernet connections are located at each graduate student desk. If you plan to use your own computer, you will need a NIC card. Dr. Hammond and his assistant, Lyle Lindberg, have a collection of recycled (not on inventory) computers that are provided on first-come-basis while supplies last. Basic Internet software (browser and email) that is freely available will be installed on the machines. Productivity software (Microsoft Office or Corel Suite) would

need to be purchased or site licensed by you or your advisor. The intent is for the students to use the PC as their machine while in graduate school in the Plant Sciences Department at North Dakota State University. The student will be responsible for ALL software and other content on the computer. Laser printers are available in each graduate student cluster for low volume printing. Graduate students should provide their own paper for printing.

The following is a statement on copyright law as it pertains to copying software. The copyright law is clear. The copyright holder is given certain exclusive rights, including the right to make and distribute copies. Title 17 of the U.S. Code states that "it is illegal to make or distribute copies of copyrighted material without authorization" (Section 106). The only exception is the user's right to make a backup-copy for archival purposes (Section 117).

The copyright law makes no distinction between duplicating software for sale or for free distribution. The law protects the exclusive rights of the copyright holder and does not give users the right to copy software unless a backup copy is not provided by the manufacturer. Unauthorized duplication of software is a Federal crime. Penalties include fines of as much as \$100,000 and jail terms of up to five years.

The Industrial Agriculture Communication Center (IACC) and several computer clusters on campus provide computers, printers, and software at different locations around campus. These computer clusters are open to all students. Both personal computers and mainframe access computers are available. Hours of availability vary from cluster to cluster and are seasonal, although certain clusters are available 24 hours a day, 7 days/week. The Computer Center staff offers non-credit seminars on several topics such as programming, statistical processing and presentations. Information concerning computer cluster availability and workshop offerings can be obtained by contacting Information Technology Services (ITS) at 231-8685 or [www.ndsu.nodak.edu/helpdesk](http://www.ndsu.nodak.edu/helpdesk).

**CREDIT UNION/BANKING.** The Financial Aid Office has short-term loans available. The Northland Educators Federal Credit Union is located at 1404 12th Ave N. Graduate Research Assistants (GRA) and Graduate Research Fellows (GRF) may borrow or deposit money. Many banks are located throughout Fargo.

**DEPARTMENTAL LIBRARY.** Agronomy Journal, Crop Science, Advances in Agronomy, Weed Science, Thesis papers, and some reprints, etc., are available in the departmental library located in Walster 202. Books and reprints should only be used in Walster or Loftsgard Hall, signed out on the Honor System, and returned to Walster 202 promptly.

**DESK ASSIGNMENT.** Each graduate student will be assigned a desk in an office in Loftsgard Hall by the department chair's secretary (PLSC main office). A bookcase, file drawers, and chair are also supplied. The desk or office may not be changed without checking with the department chair's secretary.

**E-MAIL.** Each student should obtain an e-mail address as soon as they arrive. Give your address to the department chair's secretary. All announcements will be posted on e-mail. Use the following address to register: [www.ndsu.nodak.edu/helpdesk](http://www.ndsu.nodak.edu/helpdesk).

**GREENHOUSE, PLOT LAND, AND SEED STORAGE SPACE.** The Plant Sciences Greenhouse Committees are responsible for all greenhouses assigned to the department. Any use of chemicals, e.g., insecticides, fungicides, herbicides, etc., that might affect plant material being grown by another person should be cleared with the committee prior to use. These chemicals are

to be applied only by a Certified Pesticide Applicator. PLSC hires a person to apply all chemicals. Also, only certain days and evenings are designated for fumigation and other pesticide use. The department chairman should be consulted by you and your advisor regarding use of plot land. You should contact your advisor regarding possible arrangements for greenhouse, seed storage, plant dryer, or growth chamber space.

**HEALTH INSURANCE.** Graduate students may purchase health insurance through the Student Affairs Office (231-7701, Old Main 100). Please check with this office regarding any questions you may have, necessary dates, and other requirements. Options for family insurance plans are available. International students should also see the health insurance section on page 23.

**HEALTH-MEDICAL INFORMATION.** Any registered student is entitled to medical care at the Student Health Service. Office visits are free; students pay only for procedures and medications. The Student Health Service is open Monday through Friday from 8:30 a.m. - noon and 1:00 – 4:00 p.m. Limited services are provided during the summer session. Health care is available by appointment with a physician or nurse practitioner by calling 231-7331. Pharmacy services are available by calling 231-7332.

To find a doctor in Fargo, look in the Yellow Pages of the telephone directory under "Physicians and Surgeons, M.D." Below is a list of hospitals you can contact. **For an emergency (ambulance or police) call 911.**

## HOSPITALS

Merit Care 737 Broadway Fargo, ND 234-2000 Emergency Dept.: 234-5121	Innovis Health 3000 32 <sup>nd</sup> Ave S Fargo, ND 364-8000 Emergency Dept.: 364-8400
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**HOUSING (ON CAMPUS).** Contact Residence Life (231-7700) or ([www.ndsu.nodak.edu/reslife](http://www.ndsu.nodak.edu/reslife)) for information on securing housing. A deposit is required to be placed on the waiting list. There may be a delay, depending upon the supply or demand for on-campus housing. Check with Residence Life for rental rates.

1. Bison Court or University Village (for married students) has unfurnished one-bedroom apartments and two bedroom apartments. Heating, kitchen stove, and refrigerator are furnished. The student pays electricity and telephone costs.
2. Dormitory housing is also available for "students older than average" (25 years or older). Doubles and singles are available. You must also purchase a meal plan to live in this facility. The cost of the meal plan varies, depending on the plan.

**HOUSING (OFF-CAMPUS).** If you choose to live off-campus, there is an off-campus housing list available from the Student Affairs Office (Old Main, Room 100). Other sources of apartment vacancies are: The Forum and Midweek (local newspapers), The Spectrum (campus newspaper), Apartment and FM Rentals Guide (ask at Student Affairs Office), the bulletin boards in the Memorial Union, and on the web at ([www.ndsu.nodak.edu/reslife](http://www.ndsu.nodak.edu/reslife)).

**JOB PLACEMENT.** The Career Services Office located at 211 Ceres Hall is the central placement agency for NDSU. Services are available to all students and alumni. There are fees for use of their services and there are no refunds. The office offers useful information for your personal job search. ([www.ndsu.nodak.edu/career\\_services](http://www.ndsu.nodak.edu/career_services)).

**KEYS.** Keys to the student's office and outside doors are obtained from the chair's secretary (PLSC main office). Laboratory and greenhouse keys will be supplied if needed. Student office, study rooms, departmental library, and research laboratories are available to graduate students 24 hours a day, 7 days/week. All keys must be returned to the chair's secretary when the student leaves. If you had a desk key, please leave it in your desk when you leave NDSU.

**MAIL.** Mailboxes are provided for graduate students in the main office. The address is Department of Plant Sciences, North Dakota State University, P.O. Box 5051, Fargo, ND 58105-5051. Mail arrives and departs twice daily (about 10:00 a.m. and 3:00 p.m.).

**OFFICE TYPEWRITER USE.** A typewriter is available to students in the Plant Sciences library (Walster 202). If a machine is available and the secretary approves, main office typewriters may be used on an emergency basis only.

**OTHER FACILITIES.** We often have joint projects with Biochemistry, Cereal Science, Entomology, Microbiology, Plant Pathology, Soil Science, etc. Their facilities should be used with great care and consideration and the major advisor will make arrangements for use of space and replacement of all chemicals or materials used, glassware broken, etc.

**PARKING ON CAMPUS.** A permit is required for parking on campus. GRAs are required to use student lots; GRFs can obtain a parking permit for the AR (faculty/staff) lot.

**PAYMENT.** Payments will be dispersed every 2 weeks. Checks may be either directly deposited or picked up in the main office. Graduate students with GRA appointment, or a GRF or equivalent stipend, will not ordinarily be paid by timeslip for any work time in the department. Graduate students without a GRA, GRF, or equivalent stipend may be employed on timeslip basis at the discretion of the project leader and with approval of the department chair, if funds are available, up to one-half time during the summer crop season or at busy times, i.e., seeding, harvest, pollination in the greenhouse, etc. Payment will be on an hourly basis, not to exceed the maximum hourly wage set for graduate students in the department. Exceptions may be made to the above policies where logical and appropriate, with the approval of the project leader and department chair. International students are expected to have financial support prior to their acceptance at NDSU.

**PHOTOCOPYING.** Use of the departmental copier by graduate students is limited to project-related materials (ask your advisor or the chair's secretary). A coin operated copier is available for graduate student use in Loftsgard 480A. The Copy Shop in the Memorial Union is also available for all students.

**PLANT SCIENCES GRADUATE STUDENT COUNCIL.** The Graduate Student Council is the governing body of Plant Sciences graduate students. There are annual elections and anyone who is currently a Plant Sciences graduate student is eligible to run for office.

**PUBLIC TRANSPORTATION.** The bus stops near NDSU on a specific schedule with various stops before the final one at the downtown station. To go to West Acres Shopping Center, you will

need to transfer to another bus downtown. For more information regarding scheduled times and stops for the various numbered buses, check the bus schedule or call: Metropolitan Area Transit (MAT bus) 232-7500.

Taxi Service can be obtained by calling: Yellow Checker Cab Company 235-5535.

**PURCHASES.** Consult your advisor regarding purchase of supplies. Certain procedures must be followed for all purchases and those involving on-campus purchases are very specific.

**RESEARCH FACILITIES.** Laboratory, greenhouse, growth chamber, and field space for research or teaching purposes are available to all students within reasonable limits, although certain equipment or space may be restricted to certain work or projects. Equipment, vehicles, etc., in general are available to all. Most items are used primarily by specific projects but may be available when not in use by the project. The major advisor and project leader responsible for the equipment should be consulted regarding its use, and the equipment should be maintained in good condition. Equipment of the USDA should not be used without permission of the USDA scientist concerned.

**SECRETARIAL SERVICE.** Graduate students in the Department of Plant Sciences may have final copies of the following done without charge:

- Plan of Study
- Thesis Proposal
- Abstracts for Graduate Seminar
- Overheads and Slides for Graduate Seminar
- Slides/Posters for Society Meetings (ASA, CSSA, WSSA, ASHS, etc.)

The department's laser printer can be used for the FINAL printed copy of a thesis. The secretary can provide the necessary computer commands for laser printing, but it is the student's responsibility to insert commands into the document. Printing must be done without interrupting the daily activities of the secretarial staff and the student must get permission before using the laser. Any printing in excess of one (1) final copy will be charged (per page) to the student.

Some departmental secretaries also do extra typing (other than mentioned above) after hours and will charge a fee. See the chair's secretary for information.

**SICK LEAVE.** Sick leave privileges as 12-month employees (8 hours/month).

**SMOKING.** Smoking is not permitted in any state building. All graduate student office space is "non-smoking."

**SUPPLIES.** Notebooks, photocopying, and other materials required for course work are personal expenses. Laboratory supplies for research may be purchased through your advisor's project account, and, of course, requires permission by your advisor.

**TRAVEL TO PROFESSIONAL MEETINGS.** All travel funds for GRAs and GRFs to regional or national meetings must be from Project Grant or Gift sources. Travel is dependent upon approval of NDSU administration. Travel policy interpretation or approval may vary at times, depending on the number of travel requests to a single meeting or conference, availability of funds, justification for attending, etc.

Air travel may be approved for GRA or GRF students to one national meeting during their graduate career at NDSU if the student is presenting a paper and/or interviewing for a job. Funds must come from Grant or Gift money.

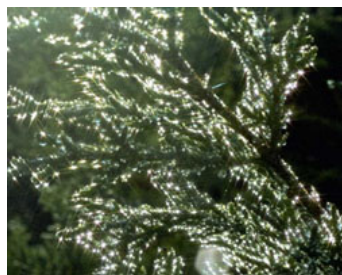
Subsistence is determined by the department chair, but graduate students (and faculty) are expected to claim only actual costs. Registration fees will be paid on Society membership basis if approval is obtained from NDSU administration on the travel request. (Society membership fees are a personal responsibility.)

**TRAVEL REGULATIONS (PROJECT RELATED).** Individuals must complete a "blanket" travel authorization form annually which covers trips less than 50 miles outside of the North Dakota border. Travel authorization forms must be completed for each trip farther than 50 miles outside of the North Dakota border. All out-of-state authorization forms must be completed at least two weeks prior to travel.

A travel expense voucher is completed after returning from the trip and turned in to the PLSC main office at the end of each month you traveled. Receipts are required for lodging and most other special items except food. There is a maximum in state and out-of-state per diem for meals and lodging. Reimbursement usually is made by check within two weeks after the travel voucher is submitted. Fargo, Moorhead, West Fargo, Casselton, Prosper, Absaroka and Northwest 22 are considered normal place of employment and, therefore, expense vouchers are not submitted for time spent at these nearby locations.

**VACATION LEAVE.** Annual leave privileges as 12-month employees (8 hours/month)

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### **M.S. IN PLANT SCIENCES OR HORTICULTURE THESIS OPTION**

Credit Requirements: 30 semester credits (minimum)  
20 credits 600-700 level courses including  
3 credits of PLSC 724 or equivalent, and  
1 credit of PLSC 790 and  
1 credit of PLSC 710  
10 credits 798 Thesis

The M.S. degree should be completed by a full-time student within approximately two years after first registration. If not completed, including approved thesis after two years, the student and major advisor will provide the Department Chair a realistic and attainable date for completion. The assistantship appointment and stipend may be terminated if the student does not complete as scheduled. Part-time graduate students must make steady progress and normally complete the degree within the time limitation of the Graduate School (seven consecutive years). If a student needs to leave Graduate School for an extended period of time, they must write a letter to the Dean of the Graduate School to formally withdraw. This will allow them to be reinstated without the consecutive enrollment requirement.

Although minors are not recognized in graduate programs, courses from more than one department may be included in the major. Graduate credit for any course taken more than seven calendar years before the final examination may not be used to satisfy degree requirements. Refer to the NDSU

Graduate Bulletin for additional information concerning the general requirements for obtaining a M.S. degree.

## **COMPREHENSIVE STUDY OPTION**

This program is intended for students who desire the advanced education of an M.S. program but do not expect to pursue a Ph.D. degree nor to conduct research as a significant component of their career.

Credit Requirements: 30 semester credits (minimum)  
27 credits 600-700 level courses including  
3 credits of PLSC 724 or equivalent,  
1 credit PLSC 790, and  
1 credit PLSC 710  
3 credits PLSC 797 Master's Paper

At least 21 of the 30 credits must be in courses approved for graduate credit numbered 601-689 and 700-789 (referred to as didactic courses). The PLSC 790 Seminar must be developed on a topic not closely associated with the topic of the PLSC 797 Master's Paper. The Master's Paper credits include a seminar presentation of the paper after completing the final comprehensive oral examination. The Master's Paper must include one of the following three options: a) conduct an experiment that is analyzed statistically and written to include materials and methods and results and discussion, b) a proposal for a research project, with all the components for submission to a fund granting agency, or c) a comprehensive literature review of an approved subject area. Please refer to the NDSU Graduate Bulletin for additional information concerning the general requirements for obtaining this M.S. degree.

## **SELECTION OF MAJOR ADVISOR**

Following the student's acceptance by the Dean of the Graduate School, the graduate student and the Department Chair will select a major advisor who will be responsible for directing the student's program of study and thesis research. Selection of the major advisor will be made on the basis of the student's interest, the availability of faculty members, and a common desire of the student and advisor to work together on a program which will enable the student to attain the desired degree. If a GRA is assigned to a specific research project, the project leader will be the major advisor of the GRA.

The student and major advisor will select related fields to study. Selection will be on the basis of the student's interest, availability of faculty members, and compatibility of the desired major and related programs.

## **PLAN OF STUDY**

A Plan of Study, which lists the courses to be taken by the student during his or her graduate studies, will be prepared by the student with guidance from his or her advisor and graduate committee. The Plan of Study must be submitted to the Department Chair prior to the end of the second semester of residence. The Plan of Study is a listing of planned and/or required academic courses, credits, grades attained in courses already completed, and credits for thesis and research. Forms are available from the department office or the Graduate School.

A student requesting and obtaining significant statistical consultation from a PLSC faculty member should register for 1-2 credits of PLSC 793 with the consultant, as recommended by the consultant and major advisor.

The Plan of Study form contains provision for transfer of graduate credits earned at another institution. Quarter credits are converted (x 0.67) to semester credits. Thesis credits will be evaluated carefully. See the NDSU Graduate Bulletin for limited credit for special topics.

After the Plan of Study is prepared by you and your advisor, submit one copy to the Department Chair for approval. After the Chair and the Plant Sciences Graduate Studies Committee accept your plan of study and selection of committee members, obtain the necessary signatures of your committee members and return it to the Department Chair.

The Department Chair forwards the plan of study to the Graduate School Dean via the Academic Dean. If both Deans approve and sign, your program of study is completed. Signed copies are sent to the student, major advisor, and the Department Chair. The Graduate School Dean appoints the final member to your thesis committee. A particular professor may be suggested as the Graduate Appointee by you via the Department Chair.

If you should need to change your Plan of Study for any reason, a Request for Change must be submitted to the Graduate School.

## **CREDIT LIMITATION**

GRAs should not register for more than 10 credits/semester (including 798-799) without permission of the Academic Dean. This restriction may be interpreted as not more than 20 credits in a 2 semester period because of a need to take courses in sequence, offering of some courses in alternate years only, etc.

## **GRADUATE COMMITTEE SELECTION**

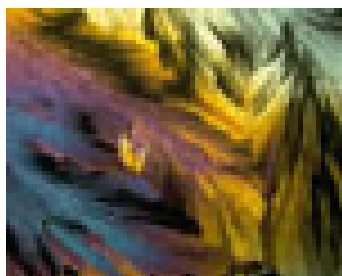
After preparing a tentative plan of study with your major advisor, discuss the selection of members to serve on your graduate committee. Your committee will help and assist you with the completion of your degree. Take your Plan of Study and thesis proposal to each of your committee members for discussion and approval. Periodic meetings with your graduate committee will help keep your committee aware of progress and changes in your plan of study and thesis/dissertation research topic; this will help avoid problems later.

## **PLANT SCIENCES COURSES OFFERED**

The following is a list of courses offered by the Department of Plant Sciences. Many related courses offered by other departments may be taken toward your degree. Your final program of study will be determined by you, your advisor, and your committee. Obtain a course catalog to determine the year and specific semester courses are offered.

<b>PLSC</b>	<b>Course Title</b>	<b>Credits</b>
<b>631</b>	<b>Intermediate Genetics (f)</b>	<b>3</b>
<b>646</b>	<b>Genetics and Plant Improvement (f)</b>	<b>3</b>
<b>653</b>	<b>Advanced Weed Science (f)</b>	<b>2</b>

655	Cropping systems: An Integrated Approach (s)	3
665	Advance Landscape Plants (fe)	2
684	Plant Tissue Culture and Micropropagation (f)	2
685	Arboriculture Science (se)	3
686	Eco-Physiology of Horticultural Crops (f)	2
710	Professional Development I (f)	1
711	Professional Development II (s)	1
724	Field Designs I (f)	3
727	Crop Breeding Techniques (su-odd)	1
731	Plant Molecular Genetics (se)	3
734	Field Designs II (so)	2
741	Cytogenetics (fe)	4
751	Advanced Genetics (so)	3
753	Action and Fate of Herbicides (se)	2
755	Advanced Crop Mgmt Decision Making (fe)	3
759	Biotechnology Applications to Plant Breeding (se)	2
763	Laboratory Methods in Weed Science (so)	2
776	Advanced Plant Breeding (so)	4
781	Quantitative Genetics (se)	4
790	Seminar (f,s)	1-2
791	Weed Biology and Ecology (fe)	2
793	Individual Study	Variable
794	Practicum/Professional Development I and II	1 each
696, 796	Special Topics	Variable
797	Master's Paper	1-3
798	Master's Thesis	Variable
799	Doctoral Dissertation	Variable



### **M.S. to Ph.D. IN PLANT SCIENCES**

Credit Requirements: 90 semester credits  
 (minimum including 30 from earned M.S. degree)  
 60 credits 600-700 level courses  
 including 3 credits of PLSC 724 or equivalent ,  
 2 credits of PLSC 790,  
 1 credit of PLSC 710,  
 and 1 credit of PLSC 711  
 30 credits 798-799 Thesis-Dissertation

The Ph.D. degree should be completed by a full-time student within approximately three years beyond the M.S. degree. If not completed, including approved dissertation after three to four years, the

student and major advisor will provide the Department Chair a realistic and attainable date for completion. The assistantship appointment and stipend may be terminated if the student does not complete the degree as scheduled. Part-time graduate students must make steady progress and normally complete the degree within the time limitation of the Graduate School (ten consecutive years). If a student needs to leave Graduate School for an extended period of time, they must write a letter to the Dean of the Graduate School to formally withdraw. This will allow them to be reinstated without the consecutive enrollment requirement. Graduate credit for any course work, not included in the master's degree, which is more than ten calendar years old at the time of the final examination may not be used to satisfy degree requirements.

Only 30 (semester) credits (20 coursework and 10 thesis) earned for a M.S. degree from another institution will be accepted by the Graduate School toward the Ph.D. degree at NDSU. All graduate credits earned at NDSU for a M.S. degree apply toward the Ph.D. Sixty credits must be earned from NDSU of which only 20 may be PLSC 799. Refer to the NDSU Graduate Bulletin for additional information concerning the general requirements for obtaining a Ph.D degree.

## **B.S. to PH.D. IN PLANT SCIENCES**

Credit Requirements: 90 semester credits (minimum)  
60 Credits 600-700 level courses including  
3 credits of PLSC 724 or equivalent,  
2 credits of PLSC 790,  
1 credit of PLSC 710, and  
1 credit of PLSC 711  
30 credits PLSC 799 Doctoral Dissertation

Admissions Requirements:

1. B.S. degree with an overall cumulative GPA of 3.00 or better, and a cumulative GPA of 3.25 for the discipline courses.
2. A Graduate Record Examination (GRE) composite score (V/A/A) of 1800 or better.

The Ph.D. degree should be completed by a full-time student within approximately four years beyond the B.S. degree. If not completed, including approved thesis after five years, the student and major advisor will provide the Department Chair a realistic and attainable date for completion. The candidate must maintain a cumulative GPA of 3.25 or better. The other requirement that is different for the B.S. to Ph.D. candidates is the addition of a submitted manuscript to a refereed scientific journal no later than the end of the fifth semester (does not include summer sessions) of the graduate program. The journal choice must be accepted by the student's graduate committee. The student must successfully defend the paper before their graduate committee before submission to the journal. This paper will be one chapter of the Ph.D. dissertation. Students who do not maintain the above requirements may be considered as candidates for the M.S. degree but must fulfill all requirements for that degree.

## **SELECTION OF MAJOR ADVISOR**

Following the student's acceptance by the Dean of the Graduate School, the graduate student and the Department Chair will select a major advisor who will be responsible for directing the student's program of study and dissertation research. Selection of the major advisor will be made on the basis of the student's interest, the availability of faculty members, and a common desire of the student and advisor to work together on a program which will enable the student to attain the desired degree. If a

GRA is assigned to a specific research project, the project leader will be the major advisor of the GRA.

The student and major advisor will select related fields to study. Selection will be on the basis of the student's interest, availability of faculty members, and compatibility of the desired major and related programs.

## **PLAN OF STUDY**

A Plan of Study, which lists the courses to be taken by the student during her or his graduate studies, will be prepared by the student with guidance from her or his advisor and graduate committee. The Plan of Study must be submitted to the Department Chair prior to the end of the second semester of residence. The Plan of Study is a listing of planned and/or required academic courses, credits, grades attained in courses already completed, and credits for dissertation and research. Forms are available from the department office or the Graduate School.

A student requesting and obtaining significant statistical consultation from a PLSC faculty member should register for 1-2 credits of PLSC 793 with the consultant, as recommended by the consultant and major advisor.

The Plan of Study form contains provision for transfer of graduate credits earned at another institution. Quarter credits are converted ( $\times 0.67$ ) to semester credits. Dissertation credits will be evaluated carefully. See the NDSU Graduate Bulletin for limited credit for special topics.

After the Plan of Study is prepared by you and your advisor, submit one copy to the Department Chair for approval. After the Chair and the Plant Sciences Graduate Studies Committee accept your plan of study and selection of committee members, obtain the necessary signatures of your committee members and return it to the Department Chair.

The Department Chair forwards the plan of study to the Graduate School Dean via the Academic Dean. If both Deans approve and sign, your program of study is completed. Signed copies are sent to the student, major advisor, and the Department Chair. The Graduate School Dean appoints the final member to your graduate committee. A particular professor may be suggested as the Graduate Appointee by you via the Department Chair.

If you should need to change your Plan of Study for any reason, a Request for Change must be submitted to the Graduate School.

## **CREDIT LIMITATION**

GRAs should not register for more than 10 credits/semester (including 798-799) without permission of the Academic Dean. This restriction may be interpreted as not more than 20 credits in a 2 semester period because of a need to take courses in sequence, offering of some courses in alternate years only, etc.

## **GRADUATE COMMITTEE SELECTION**

After preparing a tentative plan of study with your major advisor, discuss the selection of members to serve on your graduate committee. Your committee will help and assist you with the completion of

your degree. Take your plan of study and dissertation proposal to each of your committee members for discussion and approval. Periodic meetings with your graduate committee will help keep your committee aware of progress and changes in your plan of study and dissertation research topic; this will help avoid problems later.

## PLANT SCIENCES COURSES OFFERED

The following is a list of courses offered by the Plant Sciences Department. Many related courses offered by other departments may be taken toward your degree. Your final program of study will be determined by you, your advisor, and your committee. Obtain a course catalog to determine the year and specific semester courses are offered.

<b>PLSC</b>	<b>Course Title</b>	<b>Credits</b>
631	Intermediate Genetics (f)	3
646	Genetics and Plant Improvement (f)	3
653	Advanced Weed Science (f)	2
655	Cropping systems: An Integrated Approach (s)	3
665	Advance Landscape Plants (fe)	2
684	Plant Tissue Culture and Micropropagation (f)	2
685	Arboriculture Science (se)	3
686	Eco-Physiology of Horticultural Crops (f)	2
710	Professional Development I (f)	1
711	Professional Development II (s)	1
724	Field Designs I (f)	3
727	Crop Breeding Techniques (su-odd)	1
731	Plant Molecular Genetics (se)	3
734	Field Designs II (so)	2
741	Cytogenetics (fe)	4
751	Advanced Genetics (so)	3
753	Action and Fate of Herbicides (se)	2
755	Advanced Crop Mgmt Decision Making (fe)	3
759	Biotechnology Applications to Plant Breeding (se)	2
763	Laboratory Methods in Weed Science (so)	2
776	Advanced Plant Breeding (so)	4
781	Quantitative Genetics (se)	4
790	Seminar (f,s)	1-2
791	Weed Biology and Ecology (fe)	2
793	Individual Study	Variable
794	Practicum	Variable
696, 796	Special Topics	Variable
797	Master's Paper	1-3

**798 Master's Thesis**

**Variable**

**799 Doctoral Dissertation**

**Variable**

## **GRADUATE SEMINAR REQUIREMENTS**

Graduate students in the Ph.D. program must present two PLSC 790 seminars (total of two credits). The final seminar for Ph.D. candidates is part of the required 799 credits, discusses the dissertation research, and is presented after completion of the final exam. Graduate students are required to attend and evaluate all seminars, whether registered or not. The graduate student also is welcome to attend and participate in PLSC 498, undergraduate seminar.

The seminar is the responsibility of the student, but the seminar coordinator and the student's assigned topic advisor will be very helpful. Please refer to the PLSC 790 syllabus and guidelines for the specific requirements and policies.

## **TEACHING**

Two semesters of teaching experience are required for Ph.D. candidates who are U.S. citizens. International students whose native language is English or who have a TOEFL of 600 or more are encouraged to take advantage of the teaching opportunity. The student will register for 1 credit of PLSC 794 in each semester of teaching and will receive a letter grade. Students should assist in two different courses. We provide teaching opportunities for several graduate students each semester. Participation in Cooperative Extension programs with a PLSC specialist can substitute for teaching experience. Proposals for substitutions must be approved in advance by the PLSC Graduate Studies Committee. Students with prior University teaching experience can petition for a waiver.

## **GRADUATE RESEARCH REQUIREMENTS**

Ten credits of Master's Thesis (PLSC 798) are required for an M.S. and an additional 20 credits of Doctoral Dissertation (PLSC 799) are required for a Ph.D. The initial credits for 799 should deal with dissertation planning, related literature review, preparation of the research proposal, and plan of study. Later credits should deal with dissertation research progress and dissertation writing and completion. An incomplete or unsatisfactory grade may be given if satisfactory progress is not made and deadlines are not met.

## **DISSERTATION PROPOSAL**

Each graduate student will be required to prepare a proposal of the research which the graduate student and his/her major advisor have discussed in detail. All students will use the same format for this proposal and that format is presented in PLSC Professional Development I. If you are not required to enroll in this course or if you do not take the course during your first or second semester, please see the instructor for the proposal format.

The dissertation proposal is due the 2nd semester of a Ph.D. student's term. After the proposal is prepared by you, your advisor, and your committee members, submit one copy to the Department Chair. After the Chair and the Plant Sciences Graduate Studies Committee accept your proposal, submit a final copy to the Department Chair for filing.

## **PARTICIPATION IN RESEARCH PROJECT OF MAJOR ADVISOR**

The GRA on appointment in a one-half time position in Plant Sciences is expected to be on campus every working day except those on approved annual leave, holidays, or weekends. Participation in the project of the major advisor is expected to be full time in June, July, and August. The major advisor and the GRA have responsibility for the project participation time by the student. The participation time may vary among projects, or among students within a project, depending on the size and complexity of dissertation or other factors. Graduate students not on a GRA also are expected to participate extensively in project activities unrelated to their dissertation.

## **ACADEMIC PERFORMANCE**

### Academic Standards in Plant Sciences

1. The Graduate School requires each student to maintain a 3.0 (A=4) accumulated grade point average to remain in good standing. PLSC has the same standards.
2. If the academic average of the graduate student falls below 3.0, they are placed on academic WARNING and the major advisor and the student's advisory committee should evaluate the situation and make suggestions or take appropriate action. The student should improve the GPA to 3.0 or better in the next semester of course work or they are placed on academic PROBATION. A student on academic PROBATION is not eligible for a graduate assistantship or tuition waiver. A third semester of academic deficiency will result in termination of graduate candidacy.

The assistantship or fellowship may be terminated earlier than the graduate candidacy. Assistantships may be terminated for lack of adequate progress in dissertation and research, or non-participation in project activities.

## **PRELIMINARY EXAMINATION FOR THE PH.D. DEGREE**

A preliminary examination consisting of a written exam and an oral exam is required. The preliminary examination should be completed six months prior to the final examination.

THE WRITTEN EXAMINATION Exams will be given approximately April 15-16 and October 15-16. If either of the two test days fall on a weekend, the chair will designate new dates. These dates are firm for all students irregardless if students are using the new or old system. Since April 15, 2005 falls on a Friday, the next set of written preliminary exams will be April 14-15.

With the exception of examination dates, I will allow those of you that are currently in school and have not taken your written prelims to chose the current or the new option in taking your exam. See the Graduate Student Handbook for procedures under the older system. Students who apply and are accepted after October 15th will adhere to the new requirements. The new requirements are as follows:

1. A Ph.D. student cannot take his/her prelim exam until 1/3 of Ph.D. didactic course credits (excluding Master's degree credits) are completed but must take the exam by the test offering following the semester that 2/3 of Ph.D. didactic course credits are completed.

2. A student will be given five questions at 8:00 a.m. the first day. These would be collected at 5:00 p.m. the end of the first day. A student will be given five questions at 8:00 a.m. the second day. These will be collected at 5:00 p.m. the second day.
3. Students must answer all ten questions. A grade of 75% overall is required. A student who fails three or more questions over the two days has failed the exam. If a student fails a prelim exam, the student must wait two months to retake the exam. The entire exam must be retaken. If the student fails the prelim exam the second time using the same guidelines, he/she will be dismissed.

THE ORAL EXAMINATION is scheduled soon after you have completed a satisfactory written examination. The oral examination also covers course work taken at NDSU and elsewhere, as well as basic principles of plant sciences. The examination is scheduled for approximately three hours. The examining committee consists of the candidate's Advisory Committee, but the Dean of Agriculture, the Chair of Crop and Weed Sciences, and any member of the Graduate faculty may be in attendance. You must prepare a list of courses taken, with instructor and grade received, to distribute to the Advisory Committee prior to the examination. If you fail the oral examination, a second one may not be rescheduled for at least one month. The Department Chair often participates in second oral examinations. If the second oral examination is failed, the student is dismissed from graduate school.

## **DISSERTATION PREPARATION**

Candidates for the Ph.D. degree will prepare a dissertation approved by the major advisor and Department Chair, and acceptable to the oral examining committee. You may want to construct your dissertation as previous Ph.D. candidates have. A recent dissertation may be obtained from the library or your major advisor. Style should follow guidelines of appropriate national organization.

Students should refer to the NDSU Graduate School's "Guidelines for the Preparation of Disquisitions" prior to preparing their dissertation, which is available at the Varsity Mart. To avoid problems with style and general dissertation format, make sure all Graduate School requirements are met. A dissertation is a document including the results of research or advanced scholarship which is submitted in partial fulfillment of the requirements for the masters and doctoral degrees, respectively. The dissertation copy submitted to the candidate's advisory committee is subject to changes required by the advisory committee. After the required changes are made, the dissertation should be signed by the major advisor and Department Chair, and one copy submitted to the Graduate School. Students should be aware that the process of getting the dissertation approved by the Graduate School may be time consuming. You are encouraged to present a dissertation that is worthy of publication. It will be a plus for the student's career to be able to refer to a publication of his or her own.

The student and major advisor usually will be senior and junior author, respectively. A paper may be written by the major advisor upon failure of the graduate student to submit a paper. Acknowledgment should be given for major aid or counsel on research or analysis of data, provision of facilities, and financial assistance.

## **FINAL EXAMINATION FOR THE PH.D.**

A final examination is required. The final exam is oral and lasts approximately three hours. The exam must be scheduled by the Graduate School at least two weeks prior to taking the exam. A "Request to Schedule Examination" form must be completed and submitted to the Graduate School to schedule the exam. Forms can be obtained from the head secretary in the main office. After the proper signatures are obtained, the student must take the form to the Registrar's Office. They will check your

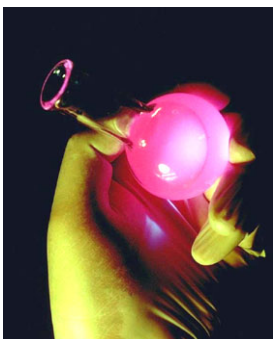
Program of Study to make sure all requirements have been met. It is best to make an appointment with the Registrar. An example of this form is in Appendix 3. If you plan to go through spring commencement, you must complete the final examination prior to graduation. All course work must be completed. The dissertation must be in the hands of the Advisory Committee at least seven days before the final examination. Below is a list of suggestions which may help you prepare for the examinations.

- Questions are not always clear, so be sure you understand the question and its intent. Request restatement or clarification if in doubt. The student may consult the person asking the question.
- If you know the answer, think a moment to formulate a good beginning, then answer as briefly and accurately as possible.
- Indicate that you cannot answer a question if you cannot, but of course "I don't know" cannot be your answer to many questions!
- Know the plants with which you worked, including something of their morphology, taxonomy and close relatives, life history, etc.
- Know basic procedures.
- Know the chemicals used in your research and how they reacted.
- Know the design of your experiment and a few others.
- Know about the calculation and interpretation of your data, and the aspects of any conflicting data.
- Know something about agriculture in North Dakota, the United States, the world.
- Know equipment and instruments you need -- and possible substitutes.
- Know hormones, enzymes, the tropisms, etc.
- Think about and know some applications of results of your dissertation and other research.
- Be broader than just your special interest -- at least topics discussed in PLSC 790 Seminar. You may get questions on seminar presentations.
- In your answers, do not use words or concepts you do not understand, or could not discuss in some detail.
- Avoid adding uncertain or incorrect statements to an already correct answer to a question.
- If you are sure of a correct answer or viewpoint, defend it calmly and logically.
- Knowledge of both details and principles is important -- know as much of each as possible.

## EXIT INTERVIEW

After the final Ph.D. exam, each student is requested to schedule a meeting with the department chair to discuss their graduate experiences.

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## GRADUATE RESEARCH ASSISTANTSHIPS

Research assistantships are available to support candidates for the Master of Science or Doctor of Philosophy degree in Plant Sciences, including biotechnology, breeding, forestry, genetics, horticulture, physiology, production, and weed science. Research assistants are assigned to specific research

projects. Completion of the M.S. degree requires approximately two years and the Ph.D. requires approximately three years beyond the M.S.

## FELLOWSHIPS AND POSTDOCTORALS

Full time postdoctoral and 80% Graduate Research Fellowships in Plant Sciences, the latter with privilege of graduate study towards the Ph.D., are available. Salary and fringe benefits are at competitive levels.

## SCHOLARSHIPS

Scholarships are available to Plant Sciences graduate students. Selections are made from a list of all eligible students during spring semester by the scholarship committee. Students returning the following fall semester are eligible, and no more than one scholarship per person is awarded. Graduate Research Fellows are not eligible for these scholarships. Scholarship descriptions and sponsors are as follows:

1. H.L. Bolley Scholarship - \$1,275 Awarded annually to a U.S. or Canadian graduate student enrolled full time in the College of Agriculture at North Dakota State University whose master's thesis or Ph.D. dissertation focuses on wheat research in one or more of the following areas: variety development, production, disease and insects, harvesting, storage, marketing, distribution, processing, and nutritional value of the crop or derived products. Selection will be based on the student's academic merit and the potential benefit of the research to the wheat industry.
  2. BASF Graduate Student Scholarship - \$500 provided by American Cyanamid and awarded to an outstanding graduate student in weed science, preferably a student showing a high level of departmental and community citizenship.
  3. Gustav N. Geiszler Memorial Scholarship - \$350 provided by family and friends of the late Gus Geiszler, former Superintendent of the North Central Agricultural Experiment Station, Minot, and awarded to an outstanding graduate student in weed science.
  4. John H. Longwell, Jr. Memorial Scholarship - \$370 Awarded to a graduate student in plant breeding in Plant Sciences, by the late Dr. and Mrs. John H. Longwell, Columbia, Missouri, in memory of their son. Dr. Longwell was a former President of NDSU.
  5. Devin Miller Memorial Scholarship - \$400 Awarded to an outstanding student in plant breeding in Plant Sciences by Dr. and Mrs. Jerry F. Miller, Fargo, in memory of their son. This award emphasizes work ethics and contribution to project activities.
  6. Eric Matthew Miller Memorial Scholarship - \$1000 an award of \$1,000 provided by the Miller family and a matching grant from Merck and Co., to an outstanding crop and weed sciences student in memory of a professional colleague.
  7. John D. Nalewaja Graduate Scholarship – An award of \$1,000 or two awards of \$500 each awarded to a weed science graduate student.
  8. Smith Fellowship for Foreign Graduate Students in Plant Sciences - \$ 680 Awarded to an outstanding foreign graduate student in Plant Sciences, preferably in plant breeding, who plans on returning to his or her homeland, based on a gift from Dr. and Mrs. Glenn Smith in honor of their parents.
  9. North Dakota Dry Edible Bean Seed Growers Scholarship – Two \$1,000 awards of \$1,000 each to an outstanding graduate student in Plant Sciences or Plant Pathology whose research is directed toward dry edible beans.
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## GENERAL SAFETY IN RESEARCH LABS, SHOPS, AND THE FIELD

Questions: Occupational Safety and Environmental Health Office, 231-7759

1. **If an emergency does occur:**
  - a) Call **911** and report the nature of the emergency.
  - b) Do NOT move any injured persons unless they are in further danger. Keep them warm.
  - c) If chemicals have been spilled on someone, get the person under a shower and wash the affected area thoroughly. If a person's clothing is on fire, wrap the person with a fire blanket or get them under a shower.
2. If you are injured and seek non-emergency medical care, a reporting process must be followed. The process involves notifying your supervisor and NDSU's Workers Compensation Coordinator (231-9587), and obtaining necessary medical care from a designated provider. Please become familiar with this process, which is explained in detail on forms kept at your place of work and in the PLSC main office.
3. Most chemicals are harmful to people and other animals/organisms to some degree, depending on dosage. Direct contact should be avoided with any chemical substance considered "safe" today which may in the future be found to cause unsuspected long-term disorders. Many substances are absorbed readily into the body through the skin and through inhalation. It is especially important to keep your hands and face clean.
4. Smoking, drinking, or eating is forbidden in the laboratory or storage areas because of the possibility of chemicals getting into the mouth or lungs. Smoking is an obvious fire hazard, and has a synergistic injurious effect when combined with exposure to many chemicals, especially if inhaled.
5. Control or restrain long hair and loose clothing when in the laboratory. A protective lab coat and gloves should be worn when working with toxic compounds.
6. Mouth suction should never be used to fill pipettes, start siphons, etc.
7. A large number of common substances are acute respiratory hazards and should be used under a fume hood in a well-ventilated room.
8. The NDSU Hazardous Chemical Management Procedures Plan requires that you be informed of all potential hazards to yourself in the work place. In turn, you must inform those around you of any possible dangers such as harmful vapors, residual radiation, and carcinogens which you are using.
9. Learn the flammability, reactivity, corrosiveness, and toxicity of materials before using them. This is important for proper use and waste disposal. Consult the hazard label found on each chemical container.
10. Before leaving the laboratory: a) return all chemicals and other materials to their proper storage place; b) turn off all services not in use such as water, electricity, gases, and

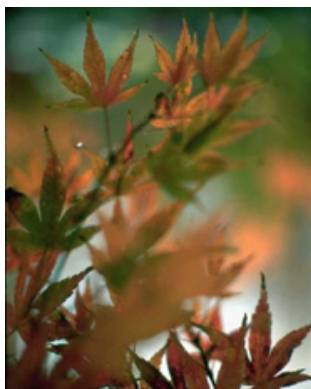
vacuums; c) lower all hood sashes to the lowest practical level; d) turn off lights in the fume hoods and laboratory; e) lock office and laboratory doors.

11. Chemical reactions that are left to run unattended (especially overnight) are prime sources for fires, floods, and explosions. Equipment such as power stirrers, hot plates, heating mantles, and water condensers should not be left on overnight. Unattended reactions should be checked periodically. Always leave a note with a phone number where you can be reached in case of emergency.
12. Know the location of exits, phones, blankets, fire extinguishers, first aid kits, etc.
13. Periodic safety seminars will be held on campus and must be attended by all new students.
14. Each project in the Plant Sciences Dept. has a safety protocol specific for the work encountered on that project. Your supervisor should discuss this protocol with you before you begin work. This protocol must be signed and returned to the University Safety Officer.
15. All students conducting fieldwork are required to attend the Worker Protection Safety Seminar scheduled each spring by the Pesticide Program Training Specialist.

**Disposal of Toxic Materials.** The Occupational Safety and Environmental Health Office (Sudro 35) has developed a Hazardous Chemical Procedures Plan that designates which chemicals can be disposed of on campus and which require special handling. Solid, noncombustible, and combustible wastes will be collected, stored, and periodically shipped to a landfill. Aqueous, non-combustible wastes must be evaporated to dryness or, if appropriate, flushed down the drain. A copy of the plan is on file with the department Safety Officer and in the department office.

The Occupational Safety and Environmental Health Office require records to be kept in each lab as wastes are generated. The paperwork associated with the campus disposal procedure is designed to ensure the safety of those people moving and incinerating the wastes. Wastes should be stored in glass or metal (if appropriate) containers until removal is necessary. Waste Disposal Request forms can be obtained from the department Safety Officer or the campus Radiation Safety Officer. If you are in doubt about disposal of any chemical, please consult these people.

Persons working with radioactive materials have more restrictive procedures and should be aware of these before beginning their research. Special radiation safety seminars are conducted on campus and must be attended by new students conducting research with radioactive materials. Consult the Safety Officer in the department if you are not informed about use or planned use of potentially hazardous materials in your research.



## **PLAN OF STUDY AND PLSC COURSES PLAN OF STUDY**

A Plan of Study which lists the courses to be taken by the student during her or his graduate studies will be prepared by the student with guidance from her or his advisor and graduate committee. The Plan of Study must be submitted to the Department Chair prior to the end of the second semester of residence by M.S. and Ph.D. candidates. The Plan of Study is a listing of planned and/or required academic courses, credits, grades attained in courses already

completed, and credits for thesis and research. Forms are available from the department office or the Graduate School (copies included in Appendix 3).

A student requesting and obtaining significant statistical consultation from a PLSC faculty member should register for 1-2 credits of PLSC 793 with the consultant, as recommended by the consultant and major advisor.

The Plan of Study form contains provision for transfer of graduate credits earned at another institution. Quarter credits are converted ( $\times 0.67$ ) to semester credits. Thesis credits will be evaluated carefully. See the NDSU Graduate Bulletin for limited credit for special topics.

After the Plan of Study is prepared by you and your advisor, submit one copy to the Department Chair for approval. After the Chair and the Plant Sciences Graduate Studies Committee accept your plan of study and selection of committee members, obtain the necessary signatures of your committee members and return it to the Department Chair.

The Department Chair forwards the plan of study to the Graduate School Dean via the Academic Dean. If both Deans approve and sign, your program of study is completed. Signed copies are sent to the student, major advisor, and the Department Chair. The Graduate School Dean appoints the final member to your thesis committee. A particular professor may be suggested as the Graduate Appointee by you via the Department Chair.

If you should need to change your Plan of Study for any reason, a Request for Change must be submitted to the Graduate School.

## **CREDIT LIMITATION**

GRAs should not register for more than 10 credits/semester (including 798-799) without permission of the Academic Dean. This restriction may be interpreted as not more than 20 credits in a 2 semester period because of a need to take courses in sequence, offering of some courses in alternate years only, etc.

## **GRADUATE COMMITTEE SELECTION**

After preparing a tentative plan of study with your major advisor, discuss the selection of members to serve on your graduate committee. Your committee will help and assist you with the completion of your degree. Take your Plan of Study and thesis proposal to each of your committee members for discussion and approval. Periodic meetings with your graduate committee will help keep your committee aware of progress and changes in your plan of study and thesis/dissertation research topic; this will help avoid problems later.

## **PLANT SCIENCES COURSES OFFERED**

The following is a list of courses offered by the Department of Plant Sciences. Many related courses offered by other departments may be taken toward your degree. Your final program of study will be determined by you, your advisor, and your committee. Obtain a course catalog to determine the year and specific semester courses are offered.

**PLSC**

**Course Title**

**Credits**

631	Intermediate Genetics (f)	3
646	Genetics and Plant Improvement (f)	3
653	Advanced Weed Science (f)	2
655	Cropping systems: An Integrated Approach (s)	3
665	Advance Landscape Plants (fe)	2
684	Plant Tissue Culture and Micropropagation (f)	2
685	Arboriculture Science (se)	3
686	Eco-Physiology of Horticultural Crops (f)	2
710	Professional Development I (f)	1
711	Professional Development II (s)	1
724	Field Designs I (f)	3
727	Crop Breeding Techniques (su-odd)	1
731	Plant Molecular Genetics (se)	3
734	Field Designs II (so)	2
741	Cytogenetics (fe)	4
751	Advanced Genetics (so)	3
753	Action and Fate of Herbicides (se)	2
755	Applied Crop Mgmt Decision Making (fe)	3
759	Biotechnology Applications to Plant Breeding (se)	2
763	Laboratory Methods in Weed Science (so)	2
776	Advanced Plant Breeding (so)	4
781	Quantitative Genetics (se)	4
790	Seminar (s,f)	1-2
791	Weed Biology and Ecology (fe)	2
793	Individual Study	Variable
794	Practicum	Variable
696, 796	Special Topics	Variable
797	Master's Paper	1-3
798	Master's Thesis	Variable
799	Doctoral Dissertation	Variable



## Summary of Time Line for M.S. Candidates

### First Semester

- Initial registration

### Second Semester

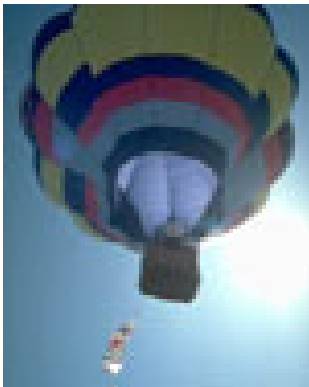
- Plan of study, with selected advisory committee, approved and filed by end of second semester.
- Research Proposal approved and filed by end of second semester.

### Final Semester

- All course work on plan of study completed and incomplete grades cleared.
- Complete draft of thesis with approval of major advisor.
- Visit all committee members to select appropriate time for final examination.
- Request final examination by having major advisor file request at Graduate School at least two weeks before intended examination date and by student meeting with graduate office to verify that all requirements have been met.
- Provide draft of thesis to each committee member at least seven days prior to examination. Following successful examination, correct thesis with suggestions of committee, have all committee members sign thesis approval form, submit draft of thesis to Graduate School, and schedule final seminar.
- Follow Graduate School guidelines after receiving final approval of thesis from Dean of Graduate Studies.

Attend commencement to receive the M.S. degree. (Optional)

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## Summary of Timeline for Ph.D. Candidates

### First Semester

- Initial registration

### Second Semester

- Plan of study, with selected advisory committee, approved and filed by end of second semester.
- Research Proposal approved and filed by end of second semester.

### Preliminary Examination

- Schedule the written preliminary exam by working with the Graduate Student Council and the departmental secretary well in advance of the preferred date.
- After successful completion of written preliminary exam, request oral examination by having major advisor file request at Graduate School at least two weeks before intended examination date and by student meeting with graduate office to verify that all requirements have been met.

- At least one academic semester must elapse between the preliminary examination and the final examination.

### Additional requirement for [BS to PhD](#) option

- Candidate must submit a manuscript to a refereed scientific journal no later than the end of the fifth semester of the graduate program.

### Final Semester

- All course work on plan of study completed and incomplete grades cleared.
- Complete draft of dissertation with approval of major advisor.
- Visit all committee members to select appropriate time for final examination.
- Request final examination by having major advisor file request at Graduate School at least two weeks before intended examination date and by student meeting with graduate office to verify that all requirements have been met.
- Provide draft of dissertation to each committee member at least seven days prior to examination. Following successful examination, correct dissertation with suggestions of committee, have all committee members sign thesis approval form, submit draft of thesis to Graduate School, and schedule final seminar.
- Follow Graduate School guidelines after receiving final approval of thesis from Dean of Graduate Studies.

Attend commencement to receive the Ph.D. degree. (Optional)

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### FOR THE INTERNATIONAL STUDENTS

The Department of Plant Sciences is interested in attracting international students with strong academic ability and above average English language proficiency.

**ACADEMIC STANDING.** To be considered for admission to the Graduate School, an applicant must hold a baccalaureate degree from an educational institution with recognized standing before beginning graduate studies. However, applications will be accepted and processed in advance of graduation when the amount of undergraduate work to be completed is not more than 15 semester hours. Undergraduate work should be equivalent to a B average.

**ENGLISH LANGUAGE PROFICIENCY.** Scores from the Test of English as a Foreign Language (TOEFL) must be submitted by graduate applicants at the time of application. Applicants with TOEFL scores lower than the minimum for unconditional acceptance into the PLSC department may be considered for conditional acceptance and be required to participate in and successfully complete the Intensive English Language Program offered during the second summer session and each semester during the year.

**FINANCES.** Certification of adequate financial support from all international applicants other than permanent residents of the U.S., parolees, refugees, US trust territory applicants, or immigrants is required. Admission will not be granted until proof of funds for the duration of study has been

submitted. A special NDSU International Student Financial Form must be completed and returned before admission is granted.

**VACCINATION RECORDS.** To register, all students must bring with them original or certified copies of their records of vaccination for communicable diseases (diphtheria, measles, rubella, whooping cough, tetanus, polio). Questions concerning this requirement should be directed to the Health Center.

**HEALTH INSURANCE.** In compliance with the North Dakota Board of Higher Education Policy, North Dakota State University requires all international students to purchase the medical insurance policy approved by the Commissioner of Higher Education for their protection in case of accident or illness. Failure to provide proof of insurance will result in cancellation of registration for students who are pre-registered or a hold on registration for those not pre-registered. Married students should also purchase a policy for their spouse and families. More information is available in the Office of International Programs, Ceres Hall, Room 338, 231-7895.

**CREDIT LOAD REQUIREMENT.** International graduate students are required by US immigration law to carry a full course of study. By NDSU rules, full-time means a minimum of 9 credit hours per semester for graduate students not on assistantship and 6 credit hours for a 1/2 time assistantship. However, there are exceptions. For example, a student who has completed all other coursework and has only the research thesis remaining may register for only one credit but is considered "full-time". The Department Chair or major advisor may need to send a letter to verify "full-time" status. Failure to comply with this requirement will result in loss of student status as defined by the Immigration Service. Out-of-status students are not eligible for benefits such as practical training and can be deported by the Immigration Service.

**US ENTRY FOR F-1 STUDENTS.** International students who use the I-20 issued by the University to enter the US and fail to register within 60 days may be reported to the Immigration and Naturalization Service (INS). Students are responsible for maintaining their F-1 or J-1 status as defined by the US Immigration and Naturalization Service (INS).

**EMPLOYMENT.** Because of employment restrictions, international students on F-1 or J-1 visas should not expect to work for compensation outside the university. Off-campus work permits can be requested through the Office of International Programs only in emergency cases and for practical training, but never are granted the first year.

International students may be employed on campus provided they have maintained their immigration status and they are in good academic standing. Such on-campus employment is limited to no more than 20 hours per week and 40 hours during vacation time. On-campus employment for first-year students may be difficult to obtain. Students on half-time assistantships may not work additional hours during the school term.

Under no circumstances may a dependent or spouse of an F-1 student (F-2) be employed. J-1 students may seek sponsor approval to work on or off campus. A dependent or spouse of a J-1 student (J-2) may work only with the approval of the Office of International Programs and the Immigration Office. In most cases, work authorization is difficult to obtain.

**TRANSFER OF FUNDS.** There are often difficulties in transferring funds from foreign countries to the United States. Students are responsible for knowing their government's requirements for foreign currency exchange permission and for requesting and submitting appropriate documents required for

transfer of funds from their countries to the United States. The Office of International Programs can issue appropriate letters of certificates, which may be of assistance to students.

**INTERNATIONAL STUDENT ORGANIZATIONS.** The following is a list of organizations for international students: International Student Association, African Student Union, Chinese Student Association, Hong Kong Student Association, India-America Student Association, Islamic Society, Korean Student Association, Kurdistanian Student Association, Latin American Student Association, Malaysian Student Association, Singapore Student Association, Tri-College Christian Fellowship, Union of Chinese Students and Scholars, and International Wives Club (off campus).

**INTERNATIONAL STUDENT ADVISORS.** The University maintains an Office of International Programs. The office activities include international student orientation, interpretation of immigration regulations, advising of international students, and a variety of support services and activities. The staff of the Office of International Programs are assigned the responsibility of approving and signing all immigration forms. International students are encouraged to seek advice for all of their questions by making an appointment to see an international student advisor at the:

Office of International Student Affairs  
(Tel. (701) 231-7895)  
P.O. Box 5582  
North Dakota State University  
Fargo, ND 58105

The office is located in Room 338, Ceres Hall.