



A YEAR OF GROWTH

2015 ANNUAL REPORT

NDSU

COLLEGE OF
GRADUATE AND
INTERDISCIPLINARY STUDIES

We have made significant strides in improving the range of programs and the quality of the education experience at NDSU.

DAVID A. WITTROCK, DEAN

College of Graduate and Interdisciplinary Studies



FROM THE DEAN

I am completing my time as dean of the College of Graduate and Interdisciplinary Studies. I want to start by saying it has been an incredible honor for me to serve in this role at North Dakota State University for the past 12 years. I am proud of the accomplishments we have made in expanding the quality of graduate education opportunities on this campus. The development of graduate education has been instrumental in NDSU's rise to becoming a Carnegie Very High Research University, which we accomplished through the hard work of the faculty and staff and by their strong commitment to graduate students. I would especially like to acknowledge the dedicated staff of the Graduate College, whose commitment to our students is phenomenal.

This has been another excellent year for graduate education at NDSU. For the second consecutive year, we have granted a record number of doctoral degrees, and we have granted 100 Ph.D.s. We have received a record number of applications to our graduate programs, indicating the level of visibility and respect graduate education is achieving on our campus. This fall, we have a record number of degree-seeking graduate students, and doctoral student numbers have increased by 4.5 percent.

The past year has been another excellent year for graduate education at NDSU.

But the success of graduate education is not based on quantity; it is found in the quality of the educational experiences we provide for our students. Throughout the past several years, the Graduate School has rapidly expanded professional development activities for our graduate students. These opportunities have been important for students whose goals for entering a graduate program, particularly at the doctoral level, have changed. In the past, students primarily pursued doctorates to enter a scholarly career. Today, only about 25 percent of students who earn a Ph.D. will be hired in a tenure-track position five years after earning their degree. Less than half will work in an academic setting. This does not mean students earning a Ph.D. are unemployed or even underemployed, but that the nature of the work they are doing has changed. This means we need to provide students with different skills and training, including the ability to discuss scholarly work with the general public. With this in mind, we implemented two new programs in the past year designed to promote communication skills. NDSU is the first university in the United States to require that all doctoral students complete a video presentation of their dissertation research, describing it in terms that are understandable to the general public. We also held our first Three Minute Thesis Competition, where graduate students were given 90 seconds to describe research in an oral presentation. NDSU joins a list of many international institutions that host the competition. In addition, we have provided writing instruction to students through the Graduate Center for Writers and have offered workshops on garnering fellowships and funding for current and future graduate students.

I want to close by thanking all of you for your efforts to advance graduate education. We have made significant strides in improving the range of programs and the quality of the education experience at NDSU. The future is bright because of all of the dedicated people contributing to this effort.

DAVID A. WITTROCK, DEAN

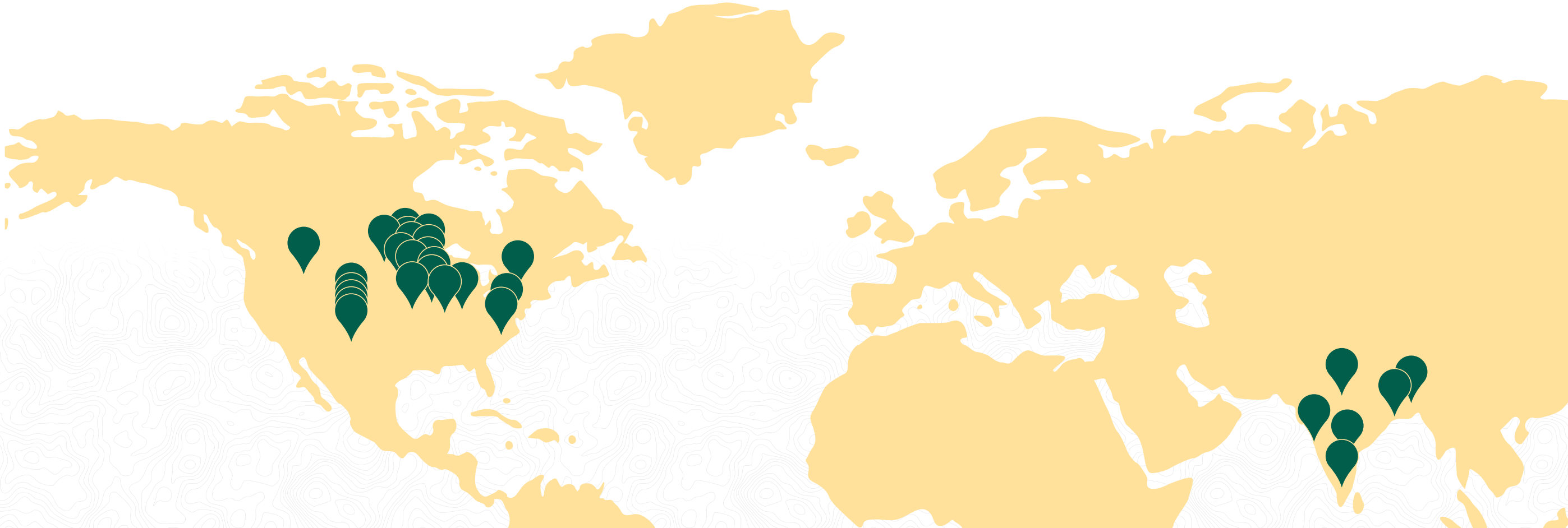
College of Graduate and Interdisciplinary Studies

The North Dakota State University College of Graduate and Interdisciplinary Studies has completed a year of tremendous growth. With the highest number of doctoral degrees conferred, NDSU is growing at a record pace. Applications to our graduate programs continue to increase as we draw students from more than 80 countries around the globe. Graduate programs are the key to our university's research mission.

GOALS AND PRIORITIES FOR THE PAST YEAR

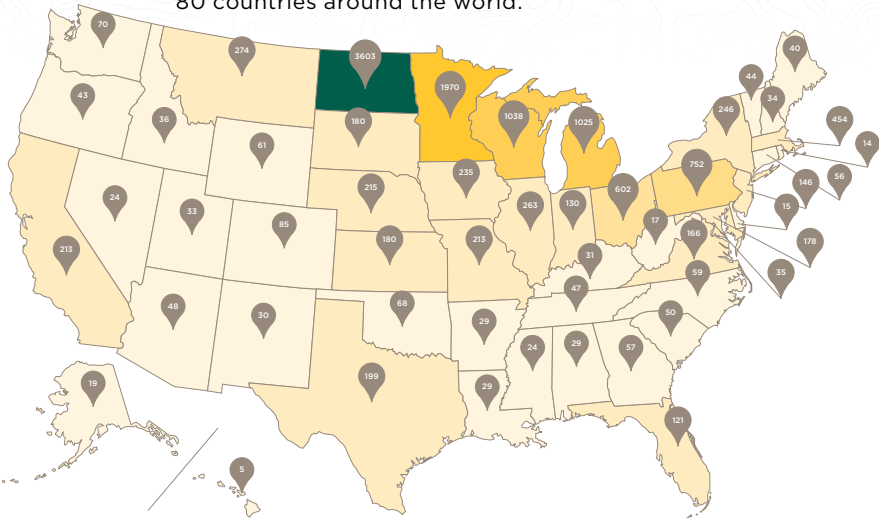
- Develop, refine and implement public relations, marketing and recruitment plans in collaboration with colleges, departments, graduate programs and other campus units.
- Meet with colleges, departments and graduate programs to evaluate application, admission and retention data. Assess program admission capacity to plan for an increase in doctoral enrollment.
- Work with colleges, departments and graduate programs to provide funding for doctoral education and develop master's degree programs to serve students who meet workforce demands.
- Focus on development activities to raise funds for endowed fellowships and scholarships for doctoral students to reach enrollment goals.
- Revise curriculum to allow for greater completion rates for doctoral students.
- Continue to develop professional workshops for graduate students and faculty, particularly focusing on mentoring and career development.





APPLICATIONS AND ENROLLMENT

Applications to our graduate programs continue to increase as we draw students from more than 80 countries around the world.



RECRUITMENT EVENTS

College of Graduate and Interdisciplinary Studies staff recruited at the following universities:

- American Public Health Association Annual Meeting and Expo
- Bemidji State University
- Brigham Young University
- Concordia College
- Dakota State University
- Dickinson State University
- EducationUSA University Fairs in Mumbai, Coimbatore, Hyderabad, Kolkata and New Delhi, India

- Luther College
- Mayville State University
- Minnesota State University-Moorhead
- National Conference on Undergraduate Research at Eastern Washington
- Purdue Big 10+ Graduate Fair
- University of Buffalo (McNair Conference)
- University of Illinois, Urbana-Champaign
- University of Jamestown
- University of Kansas (McNair Conference)
- University of Minnesota-Morris

- University of South Dakota
- University of Utah
- University of Virginia
- University of Wisconsin – Madison
- University of Wisconsin – Milwaukee (McNair Conference)
- University of Wisconsin – Superior
- Utah State University
- Utah Valley University
- Valley City State University
- Weber State University
- 10 virtual fairs



GRADUATE STUDENT AMBASSADORS

The Graduate School implemented a Graduate Student Ambassador program. This involves current graduate students in recruiting prospective students and representing their program on campus. Selected students have the opportunity to represent the university in numerous ways, including leading building/lab tours for prospective student visitors, hosting and speaking at open house events, speaking at orientation on student panels, volunteering at commencement, presenting to local organizations, attending local/regional graduate fairs and participating in media opportunities.

GRADUATE STUDENT PROFESSIONAL DEVELOPMENT SERIES

Graduate students at NDSU aspire to have careers in a variety of fields within and beyond academics. The Graduate School offers professional development opportunities and training for students in a variety of areas to meet their current academic and future professional requirements. In the last academic year, the following training topics were offered:

- Networking
- Resources for career exploration
- Dissertation video workshop
- Using LinkedIn in a career search
- CV/resume writing
- Bullying in the workplace
- Teaching assistant learning conference and ongoing training
- Three Minute Thesis competition training
- Responsible conduct of research
- Improv to improve: Building scientific communication skills
- Secrets of success for grad students: How to “wow” your faculty
- Soft skills in business and industry
- Finding grants
- Project management
- Business ethics
- Selling skills

GRADUATE STUDENT PROFESSIONAL DEVELOPMENT SUCCESS

The College of Graduate and Interdisciplinary Studies supports students throughout the year by offering professional development training and activities. The 2014-15 academic year included the Research and Arts Forum, Three Minute Thesis Competition, Doctoral Dissertation Video Requirement and the Fellowship and Funding Workshop.



RESEARCH & ARTS FORUM

The Graduate Student Council hosted a Research and Arts Forum Poster Session Feb. 4, highlighting student projects across all NDSU colleges.

3 MINUTE THESIS COMPETITION

The College of Graduate and Interdisciplinary Studies held its first Three Minute Thesis Competition Feb. 4, where graduate students presented their research and its significance. Faculty, students and community leaders judged 25 presentations.

DOCTORAL DISSERTATION VIDEO REQUIREMENT

The College of Graduate and Interdisciplinary Studies implemented a new requirement for doctoral students to distill their research into a three-minute video presentation. To date, 100 videos have been posted in the library's online repository.

FELLOWSHIP AND FUNDING WORKSHOP

The College of Graduate and Interdisciplinary Studies and the Graduate Center for Writers hosted a fellowship and funding workshop for students to create proposals to send to the National Science Foundation and other funding agencies.

Allison Peltier, a graduate student in advanced nursing practice, delivered the winning presentation in NDSU's first Three Minute Thesis Competition, earning the \$1,000 grand prize.

Peltier presented "Addressing Cervical Cancer Disparities Among American Indian Women: Implementing an Education Module for Healthcare Providers." She described her focus on contributing factors to cervical cancer disparities among American Indian women, including unique risk factors and barriers in health care access.

"The quality of the research these students presented was outstanding," College of Graduate and Interdisciplinary Studies Dean David Wittrock said. "Their ability to convey the value of their work clearly and concisely is going to be an asset as they enter the workforce."

Local and state civic and business leaders, along with NDSU students and faculty, judged the competition. They selected Peltier's presentation from a group of five finalists that also included Lutfur Akand in civil engineering; Adam Edwinson in molecular pathogenesis; Venkata Indurthi in pharmaceutical sciences; and Courage Mudzongo in developmental science. Each of the finalists earned \$250 for advancing from the competition's initial rounds.

THREE MINUTE THESIS COMPETITION

"We have to sell our ideas to generate support and change the world," said J. Patrick Traynor, president of the Dakota Medical Foundation and competition judge. "These students are really deep thinkers who are researching practical things that can have an impact in people's lives today. It's amazing."

The competition began with 25 students from a variety of disciplines competing in early rounds. Their objective was to quickly explain the goals and value of their research in terms relevant to government officials, media, future employers and funding organization representatives.



Allison Peltier
Nursing, DNP
Dr. Loretta Heuer

Venkata Indurthi
Pharmaceutical Science, Ph.D.
Dr. Stefan Vetter

Adam Edwinson
Molecular Pathogenesis, Ph.D.
Dr. John McEvoy

Lutfur Akand
Civil Engineering, Ph.D.
Dr. Mijia Yang

Courage Mudzongo
Developmental Science, Ph.D.
Dr. Brandy Randall

GRADUATE CENTER FOR WRITERS

The Graduate Center for Writers completed its 2011-14 strategic plan having transformed from a traditional writing center into a center for graduate disciplinary writing. In 2010, graduate students could only get help at NDSU's writing center from four master's students in English, who also worked with undergraduates. In fall 2014, the newly established Graduate Center for Writers specialized in extensive writing and scholarship assistance to graduate students.

- The center provided one-on-one sessions, group sessions, workshops, faculty writing assistance and course support.
- One-on-one sessions were provided online for distance students.
- All writing consultants engaged in ongoing professional development and training.
- Three colleges were served by disciplinary writing consultants (see below).
- The center joined with the Graduate School disquisition processor to coordinate services.
- A new one-credit graduate writing course was established, one was piloted, one more proposed and several are in development.
- The staff consisted of a 3/4-time director, a 2/3-time assistant director and seven consultants (two lecturers, one adjunct lecturer and four doctoral students).

INDIVIDUAL WRITING ASSISTANCE

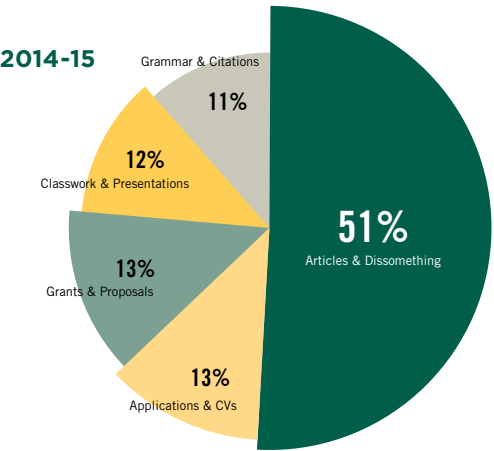
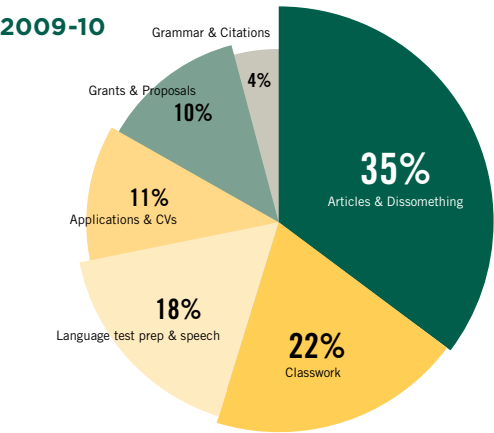
2014-15 Sessions

College	Visits (unique clients)	Doctoral	Master's	Other
AFSNR	238 (53)	38	184	16
AHSS	91 (26)	51	40	
Bus	11 (6)		11	
Eng	192 (46)	118	73	1
HDE	296 (39)	177	117	2
Health Pr.	65 (16)	23	39	3
Intrdisc.	166 (27)	146	20	
SM	193 (38)	94	99	
Other	59 (13)			59
TOTAL	1,311 (264)	647 49%	583 45%	81 6%

Note - The number of visits does not include graduate students who visited the undergraduate Center for Writers

The growth and increased disciplinary focus of the Graduate Center for Writers are evidenced when comparing 2014-15 to 2009-10:

- The number of individual sessions increased by 50 percent.
- The number of doctoral students served more than tripled.
- Work on disquisitions and articles for publication went from 1/3 to 1/2 of sessions.



DISCIPLINARY WRITING CONSULTANT INITIATIVE

Disciplinary writing consultants are experienced writers from a discipline who are trained as consultants and work with students, faculty, departments and NDSU colleges to improve graduate writing.

- Consultants worked in three colleges (Agriculture, Food Systems and Natural Resources; Human Development and Education; and Science and Mathematics).
- Consultants were funded by the Graduate Center for Writers and their home colleges.
- Consultants provided more than 400 sessions to students in their colleges, as well as discipline-specific workshops.
- Observations of sessions with students confirmed that disciplinary writing consultants help with scholarship as well as writing.
- Consultants assisted with specific college needs, e.g., coordinated student disquisition groups, developed targeted writing units for courses (Human Development and Education), and piloted a one-credit literature review course (Agriculture, Food Systems and Natural Resources).
- Consultants assessed individual and class writing in the College of Human Development and Education and trained faculty in both assessing writing and developing appropriate interventions.
- Consultants helped "stagnating" students, including distance students, to complete their disquisitions.
- Consultants helped faculty publish articles and write grant applications.
- Feedback from students and faculty has been overwhelmingly supportive of the disciplinary writing consultants initiative.
- A consultant was identified, funded and trained to work in 2015-16 in the College of Engineering.

OTHER WRITING SUPPORT

- The Graduate Center for Writers provided more than 20 workshops and presentations; six campuswide workshops focused on literature reviews, proposal-writing and plagiarism.
- Consultants trained in the successful UC Riverside model for applying for National Science Foundation graduate fellowships, and they worked with National Science Foundation Graduate Research Fellowships Program (GRFP) applicants.
- Writing consultant member of Education Leadership's "Team NDSU" provided high value and was requested to expand her role.
- The writing consultants were integrated into the multi-disciplinary "Discovery-Based Learning" teams (based in the College of Engineering) for a National Science Foundation Research Traineeship application and, independently, in 2015-16 coursework.
- The Graduate Center for Writers conducted an online writing needs survey in three colleges (Science and Mathematics; Human Development and Education; and Health Professions), and the disciplinary writing consultants surveyed faculty in every Science and Mathematics department.
- The GRFP planned intense programmatic support, including a writing assessment of incoming students and wrap-around support services, for the Master of Public Health program in 2015-16.

TEACHING AND LEARNING

PAUL KELTER, PH.D.
Director, Office of Teaching
and Learning

GOALS AND MANIFESTO

The Office of Teaching and Learning is a combination and expansion of several existing offices. It began operation on July 1, 2015, to provide and support the creation of student-centered, innovative educational programs and professional development to strengthen teaching and learning.

We are an active-learning laboratory for the consideration of ideas and assessments that include student-based problem solving, group discussions to sharpen insight, collaborative projects and case-study-based discussions, among others.

We seek to establish active learning as the norm in education and program planning as we implement programs in which participants feel valued.



OFFICE STRUCTURE

Our office includes 11 staff members along with one graduate student and three undergraduates. The students all work in supporting these parts of the office:

- Center for Science and Mathematics Education (K-20 STEM education programs).
- Distance and Continuing Education (Distance and Continuing Education serves the educational needs of our region's K-12 teachers and place-bound students, as well as supporting programs throughout the campus community.)
- IDEASpace (A student-focused space that fosters creative confidence and innovation through design thinking, mentoring and collaboration.)
- Group Decision Center (Using technology and skilled facilitators, provides group facilitation services to assist in focus groups, strategic planning, problem solving, decision making, and consensus building.)
- National Science Foundation-funded Gateways-ND faculty development: (The focus of this five-year, \$2.63-million project is on developing expertise in active learning among science, technology, engineering and mathematics faculty at NDSU. It also examines the relationship between student and faculty attitudes about teaching and learning and success in the STEM classroom.)

RECENT SUCCESS

In the last academic year, we have offered 642 professional development courses serving 4,646 teachers and other professionals.

The Gateways-ND grant will provide faculty training from 2016 until at least 2020.

We partnered with the Graduate School to offer two rounds of intensive graduate teaching assistant training that served more than 150 NDSU teaching assistants.

Our external programs in partnership with the College of Science and Mathematics included the 800-student middle and high school Science Olympiad competitions, along with the Governor's School summer residential program for about 80 of North Dakota's finest high school students.

Our IDEASpace and Group Decision Center are busy with consulting and evaluation on a continual basis.

CELLULAR AND MOLECULAR BIOLOGY INTERDISCIPLINARY GRADUATE PROGRAM

JANE SCHUH, PH.D.
Coordinator, Cellular and
Molecular Biology Program

The program teaches contemporary research techniques across an array of disciplines, which allows our program to be particularly well-positioned to fill a need for scientists who are trained to collaborate across a variety of subject areas. This is an important distinction, and one that we are very proud of.

In 2014, Mark Sheridan, who had served as the program director for nearly a decade, was hired by Texas Tech University as their graduate school dean. Jane Schuh took over as the program director/coordinator in October 2014. A number of the faculty, like Sheridan, had left the university for new opportunities or retirement. In late 2014, an

invitation was extended to new faculty members in all related disciplines, and individuals who chose to be included in the affiliated faculty were added to the list of potential faculty mentors. All affiliated faculty descriptions were updated with current research interests. The program currently houses faculty from six departments and three colleges.

Our faculty mentors are productive researchers who are competitive in acquiring research awards and patents, as well as disseminating their work through invited talks and peer-reviewed publications. Our students are productive while they're in training, often publishing several manuscripts as a result of their work at NDSU. Matriculating students are successful in their careers after leaving NDSU. Each of the students who graduated from the program in the last seven years has found either a postdoctoral research fellowship or permanent independent work in their field.

Cellular and molecular biology is a good recruiting engine, especially for international students and for research laboratories that have a slightly different focus. With additional focus on recruiting, our combined pool of graduate applicants could be a very strong source of excellent students to help the university toward its goal of increasing the percentage of graduate students in the overall population. It also could provide a potential source of student teachers to assist with teaching many sections of service courses and laboratories that will be needed as the university grows. Eight students have started the program within the last year, providing a sizable cohort to work with. We intend to continue to grow the program through enhancing communication of open positions, accepting government-funded students, encouraging our students' participation in the Graduate School's fellowship writing program, and updating the qualifying exam policies to enable grant applications from this process to be easily submitted to help fund student stipends and tuition.

2015 CELLULAR MOLECULAR BIOLOGY STEERING COMMITTEE

Represented Unit	Faculty Participant
Program Administration	Schuh, Jane
Biological Sciences	Reindl, Katie
Chemistry and Biochemistry	Srivastava, D.K.
Pharmaceutical Sciences	Sun, Chengwen
Veterinary and Microbiological Sciences	Bergholz, Teresa

CURRENT CELLULAR MOLECULAR BIOLOGY STUDENT PROFILES (AS OF END OF 2015)

Name	Adviser	Home Department
Adsero, Angela	Haring, Stuart	Chemistry and Biochemistry
Berry, Missy	Schuh, Jane	Veterinary and Microbiological Sciences
Cambron, Liz	Greenlee, Kendra	Biological Sciences
Dailey, Kaitlyn	Wilkenson, John	Chemistry and Biochemistry
Kadasah, Sultan	Leclerc, Estelle	Pharmaceutical Sciences
Mei, Yang	Sinha, Sangita	Chemistry and Biochemistry
Mohammad, Jiyan	Reindl, Katie	Biological Sciences
Sedigh, Abbas	Srivastava, D.K.	Chemistry and Biochemistry
Singh, Rahul	Srivastava, D.K.	Chemistry and Biochemistry
*Walock, Chad	Sheridan, Mark	Biological Sciences

* Walock is co-advised by Wendy Reed, Biological Sciences department head

ENVIRONMENTAL AND CONSERVATION SCIENCES

EAKALAK KHAN, PH.D.
Director, Environmental
and Conservation
Sciences Graduate Program

In 2014-15, the environmental and conservation sciences program had seven Ph.D. graduates and one M.S. graduate. It's the largest group of Ph.D. graduates in the history of the program. The number is significant because the program is relatively young (11 years) and has only 30-40 students. Thirteen students in the program worked on externally funded research. The total amount of external funding for projects that included our students was approximately

\$1.6 million. A substantial portion of the funding is from prestigious and highly competitive sources such as the National Science Foundation and National Institute of Food and Agriculture, and United States Department of Agriculture. Students in the program produced a total of 12 journal articles. One of these journal articles, written by Nurun Nahar, a doctoral student and her adviser in the Agricultural and Biosystems Engineering department, Scott Pryor, received the 2015 American Society of Agricultural and Biological Engineers Superior Paper Award.



NURUN NAHAR



SCOTT PRYOR

Our students and affiliated faculty contributed to the success of the program. Several students received competitive internal and external fellowships/assistantships such as the North Dakota Water Resources Research Institute Fellowship and the NDSU Graduate School Doctoral Dissertation Fellowship. Through the Environmental and Conservation Sciences Graduate Student Association, students represented the program well in local public events such as Fill-the-Dome and Red River Zoo volunteer programs. In October 2015, the program celebrated its 10th year by organizing a poster competition, a campus-visit recruiting event and a presentation by a renowned scientist from the Environmental Protection Agency.



GOALS

The program has set several short- and long-term goals. For the short-term, the program would like to maintain a similar enrollment as the past few years of 30 to 40 students. Keeping the enrollment at the current level is challenging due to more competitiveness and lower funding rates by grant agencies. Financial support from the NDSU Graduate School to the program covers only about three to four assistantships. Funding is required to maintain the enrollment. The program will continue to identify grant opportunities for our students and affiliated faculty and encourage them to apply. Specifically, the program will encourage affiliated faculty to secure large interdisciplinary grants for research centers and/or graduate student training such as National Science Foundation Research Traineeship and Department of Education-Graduate Assistance in Areas of National Need. The program will be a facilitator or a leader for efforts to pursue these grants. Developing a handbook for students in the program is another short-term goal.

Increasing enrollment is one of the long-term goals. More students will help increase scholarly activities and visibility of the program. Along with pursuing funding more aggressively, recruiting more affiliated faculty will help in achieving this goal. Another long-term goal is establishing dual-major programs with various departments. For example, our program's students and local students in biological sciences may earn a graduate (M.S. or Ph.D.) degree in environmental and conservation sciences and in biological sciences. The dual-major programs will increase not only enrollment but also the number of affiliated faculty. In addition, dual-major degrees will enhance the marketability of graduates. The Environmental and Conservation Sciences program has already worked with several departments on logistics for dual-major programs.

FOOD SAFETY GRADUATE PROGRAM

PAUL SCHWARZ, PH.D.
Director, Food Safety
Graduate Program

Food safety faculty engage in multidisciplinary research and education to provide solutions to food safety, protection and security challenges. The need for individuals with food safety expertise is becoming more important in government, business and academia.

PROGRAM DESCRIPTION

Food safety is an interdisciplinary program under the NDSU Graduate College. Thirteen faculty members represent the Departments of Agribusiness and Applied Economics; Animal Sciences; Veterinary and Microbiological Sciences; Health, Nutrition, and Exercise Sciences; and Communication. Food safety graduate programs include thesis-based M.S. and Ph.D. degrees, a non-thesis M.S. option and a Graduate Certificate in Food Protection. The Graduate Certificate is offered through online courses and is targeted toward professionals needing additional background in food safety. In addition, numerous NDSU students majoring in other fields of study also complete these courses.

PROGRAM MISSION

Food safety faculty engage in multidisciplinary research and education to provide solutions to food safety, protection and security challenges. The need for individuals with food safety expertise is becoming more important in government, business and academia.

PROGRAM ACCOMPLISHMENTS AND STRENGTHS

Education remains the key strength of the food safety program, and the nine online courses (SAFE 601-609) are the core. There were seven graduate students enrolled during fall 2015 (four Ph.D., one M.S., two Graduate Certificates). An additional three M.S. students joined the program in spring 2015. One M.S. student completed her degree in spring 2015, and two Ph.D. candidates graduated in summer 2015. Food safety committee assignments were made and included applicant review, graduate certificate advising and food safety outreach. The graduate bulletin was significantly revised, and a fact sheet was prepared. The processing of graduate applications and handling of student needs has improved greatly through coordinated efforts of staff in the Graduate School and Department of Plant Sciences.



PROGRAM CHALLENGES AND NEEDS

Paul Schwarz's appointment as interim program director ends in spring 2016, and a short-term challenge is to identify a program director. Program review is to be completed in 2016.

PROGRAM GOALS FOR THE NEXT YEAR

Establish a food safety curriculum committee, and discuss new courses and the need for revision of existing courses and graduate programs.

LONG-TERM GOALS

There is strong interest in NDSU's programs in food safety, both on domestic and international levels. This represents opportunity for growth and recognition of the program. However, growth will present challenges to the current structure. Dialog is needed on how to effectively and sustainably handle expansion of the programs. The graduate faculty, Graduate School, vice president for agricultural affairs, and the Global Institute for Food Security and International Agriculture all need to be part of this conversation.

GENOMICS AND BIOINFORMATICS

PHILLIP McCLEAN, PH.D.
Director, Genomics
and Bioinformatics
Graduate Program

This past year, the Genomics and Bioinformatics program experienced its largest incoming class. This included two new Ph.D. and two new M.S. students. The program is at an all-time high enrollment of 14 students. Of these students, nine are pursuing a Ph.D. degree, and five are M.S. students. Two of those students joined the research group of three new faculty, two located in veterinary and microbiological sciences and one in plant pathology. Of the 14 current students in the program, one is self-supported and one is supported by a Fulbright Scholarship. All of the remaining students are supported by faculty-supported grants. The primary funding sources include the United States Department of Agriculture National Institute of Food and Agriculture/Agriculture and Food Research Initiative program and the U.S. Agency for International Development. Research was presented by several students at the major agricultural-based genomics conference, Plant and Animal Genome, held in San Diego during January 2015. Phillip McClean received the College of Agriculture, Food Systems, and Natural Resources senior career research award.



GOALS

The top goal is to increase program enrollment. Because the program only accepts students (with infrequent exceptions) who are supported by faculty, it is important for faculty to be aware of funding opportunities. As such, the faculty is continuing their pursuit of new grant support. At this time, we are not using our assistantship funds from the Graduate School. Funds will be used this year if, unlike last year, acceptable students can be matched with interested faculty.

Dual-degree programs offer another opportunity to expand the program. Interested departments will discuss the possibilities. Those types of cooperative programs will work when a clear synergy is recognized by the participating programs. To drive students to such programs, the new curriculum must be designed to optimize the career opportunities for our students and not be just the sum of the required courses for the two programs.

The Materials and Nanotechnology program continues to grow and build critical momentum. Six Ph.D. candidates successfully defended their dissertation research during 2014-15, and roughly half of these recent doctoral graduates are now in postdoctoral positions at other institutions. There are presently around 20 graduate students in the program, which is encouraging in the current climate of competitive research funding. These include several international scholars, including a Fulbright Scholar.

Several researchers had their work featured on the covers of notable leading journals, including The Journal of Polymer Physics, Soft Matter, Langmuir and The Journal of Chemical Physics. Researchers also published collaborative papers in several high-impact factor (IF > 10) journals, including The Journal of the American Chemical Society (IF = 12.11), ACS Nano (IF = 12.88), Chemical Reviews (IF = 46.58), and Advanced Functional Materials (IF = 11.8). One group claimed simultaneous dual honors by having its work featured on the cover of Angewandte Chemie (IF = 11.26). High-impact publications are important for NDSU and materials and nanotechnologies because they bring positive recognition, grow our global reputation and attract critical external funding.

ERIK HOBBIE, PH.D.
Director, Materials and Nanotechnology Graduate Program

MATERIALS AND NANOTECHNOLOGY

One highlight of the past year was the launch of the Materials and Nanotechnology Seminar Series. Notable 2015 visitors included Frank S. Bates, former head of the chemical engineering and materials science department at the University of Minnesota and a member of the National Academy of Engineering. These seminars expose students and faculty to cutting-edge research in materials science and engineering. Hosting notable visitors also gives the program valuable exposure and strategic networking opportunities across the national and international research scene.

Despite an extremely competitive funding climate, NDSU faculty members continue to achieve notable success stories. For example, assistant professor Andrew Croll was awarded the Air Force Young Investigator Award for research on crumpled and prescriptively folded polymer films. This research is of particular interest for aerospace applications that require advanced lightweight materials.

As we move ahead into 2016, we are highly optimistic the program will continue to grow in both size and stature. It is an exciting era of materials and nanotechnology research at NDSU.

NATURAL RESOURCES MANAGEMENT

EDWARD DeKEYSER
Director, Natural Resources Management Graduate Program

PROGRAM DESCRIPTION

Natural resources management is contained within the School of Natural Resource Sciences at NDSU. The interdisciplinary program is comprised of academic courses and research programs in affiliated programs/departments offered through the Colleges of Agriculture, Food Systems, and Natural Resources; Science and Mathematics; Engineering; and Arts, Humanities, and Social Sciences. The Natural Resources Management interdisciplinary graduate programs offer a Master of Science degree, a Master of Natural Resources Management professional degree and a Doctor of Philosophy degree. The core faculty of the program is comprised of two tenure-track faculty (Jack Norland, associate professor, and Christina Hargiss, assistant professor of practice), one program assistant (Bruce Steele) and a program leader (Edward “Shawn” DeKeyser, associate professor of range science). The overall graduate program had 88 students in 2014-15 (Table 1).

PROGRAM MISSION

To establish and implement educational and research programs directed toward educating students in the areas of natural resources expertise, enabling them to employ this knowledge in solving problems associated with the management of natural resources for their highest and best uses for society while maintaining the integrity of natural systems.

PROGRAM ACCOMPLISHMENTS AND STRENGTHS

The graduate programs are largely supported by the faculty within the School of Natural Resource Sciences as well as other departments within the College of Agriculture, Food Systems, and Natural Resources. The number of graduate students is encouraging even though the student numbers dropped in spring semester. Christina Hargiss was recently promoted to tenure-track assistant professor. The promotion has allowed her to increase her research capabilities. She has recently started mentoring a number of graduate students. Overall, our faculty and program leader have competed for and received a number of grants to support graduate students in research assistantships. The program also has added three new graduate-level courses for its students in the past year.

PROGRAM GOALS FOR THE NEXT YEAR

The program is competing as a multidisciplinary college team for the NDSU Learning and Student Success Grants. Part of the grant proposal includes the tuition recovery model for funding teaching assistantships, which we believe will aid in graduate level course maturation. The model also has a plan for providing needed support for national advertisement to increase enrollment. Also included in the proposal is an educational needs survey of natural resource management professionals of the region. We believe the survey will expand graduate level opportunities to a range of students throughout the region. This includes the development of new courses needed by the people of the region responsible for the care of natural resources, and the possible creation of unique opportunities through program or certification development to cater to the needs of the people of the region.

Fall 2014				Spring 2015			
	MS	MNRM	PhD		MS	MNRM	PhD
TOTAL	22	20	7	TOTAL	24	11	4

Table 1. Graduate student enrollments by term in the natural resources management graduate programs

TRANSPORTATION

The transportation and logistics program is a joint effort of the Colleges of Agriculture, Food Systems, and Natural Resources; Arts, Humanities and Social Sciences; Business; Engineering; and Science and Mathematics; as well as the Upper Great Plains Transportation Institute. The following departments actively participate in the program: agribusiness and applied economics, civil engineering, industrial and manufacturing engineering, management and marketing, geosciences and emergency management.

PROGRAM DESCRIPTION

North Dakota State University offers an interdisciplinary program leading to the:

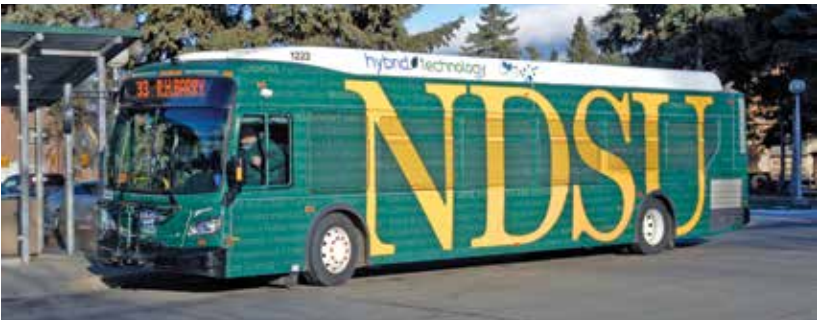
- Ph.D. degree in transportation and logistics
- Master of Science in transportation and urban systems
- Master of transportation and urban systems
- Master of Managerial Logistics
- Graduate certificate in transportation and urban systems

The programs are offered by the College of Graduate and Interdisciplinary Studies and coordinated by the Upper Great Plains Transportation Institute. Denver Tolliver, director of the institute, is the program director. Joseph Szmerekovsky of the Department of Management and Marketing is the associate director.

PROGRAM MISSION

The mission of the transportation and logistics program is to contribute to NDSU's mission as a student-focused, land-grant, research university by producing graduates with skills to address today's transportation and logistics challenges. This is done by:

- Providing an interdisciplinary environment where knowledge from diverse fields is integrated and leveraged to address transportation and logistics challenges.
- Providing a doctorate in transportation and logistics with curriculum that reflects the contemporary challenges and interdisciplinary nature of transportation and logistics to prepare students to conduct cutting edge research.
- Providing online certificates and master's degrees that are targeted to professionals seeking to advance their capabilities in the transportation and logistics sectors.
- Providing opportunities for students to work with innovative centers focused on providing research solutions to contemporary transportation and logistics issues.
- Providing opportunities for students to work on research projects that address societal needs regarding transportation and logistics issues.



PROGRAM ACCOMPLISHMENTS AND STRENGTHS

We continue to focus on strengthening our doctoral program and increasing enrollments in our master's programs. Accomplishments during the 2014-15 academic year were primarily related to strengthening the program and include:

1. The development of new 800-level courses designed to not only provide technical proficiencies, but also the more tacit skills required by successful researchers. Specifically, TL 811 Modeling for Logistics Research, TL 823 Contemporary Supply Chain Research, TL 829 Supply Chain Risk Management, TL 831 Modeling for Transportation and Logistics Decision Analysis and TL 885 Geospatial Information Systems for Transportation were all approved. TL 831 was taught last summer and will be offered each summer as a new core requirement, replacing the previous 700-level course. TL 811 is being taught in fall 2015, TL 823 is scheduled for spring 2016 and TL 829 is scheduled for spring 2017.
2. A student handbook has been created to provide students with guidance and structure for navigating the program and completing all program and university requirements in a timely fashion. The handbook was distributed to all students at the fall 2015 orientation, and an up-to-date version will soon be ready online for student access.
3. A common written preliminary qualifying exam is now administered to all doctoral students. This was started in fall 2014 and continues with the exam being offered once each academic year. The common exam for all students guarantees a common skill set in students before they begin their research. As students are required to submit their plan of study before sitting for the exam, it also has motivated students to select advisers and form committees early in their academic careers.
4. A form has been developed to more closely track the progress of students registering for TL 899 Dissertation credits. The form requires students to develop a clear expectation of work between advisers and students before students can register for TL 899 credits. Advisers now must report on whether those expectations were met before students can receive a satisfactory grade.
5. Non-tenure faculty designations (assistant/associate professor of transportation) were approved by the provost for qualified personnel with doctoral degrees, and a faculty designation committee was formed. The committee reviewed four applicants and recommended that three receive faculty designations (two assistant and one associate). Ultimately, two faculty designations were approved (one assistant and one associate) as the third applicant transferred to another university.
6. Several potential partnerships were explored that could strengthen the program: (a) a potential partnership with the University of Modern Sciences in the United Arab Emirates to offer the transportation and urban systems certificate to audiences in Dubai; (b) a potential partnership with the University of Wisconsin-Superior, which offers an undergraduate degree in transportation and logistics; and (c) an expanded partnership with the Civilian Command of the Department of Army to bring Army civilians into the Master of Managerial Logistics program and establish internship programs funded by the Army.

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DENVER TOLLIVER, PH.D.
Director, Transportation and Logistics Graduate Program

TRANSPORTATION

We continually market all degree programs at industry conferences, workshops and exhibit halls to promote educational opportunities in transportation and logistics at NDSU.

Accomplishments related to increasing enrollments include:

Enrollments have increased to 39 Ph.D., 25 M.S., MTUS, certificate and 19 MML with applications increasing to 82 Ph.D., 44 M.S., MTUS, certificate and 34 MML applications.

Enrollment growth is the result of intensive marketing to Fort Leavenworth, Kansas; Fort Lee, Virginia; and other military bases across the United States. We continually market all degree programs at industry conferences, workshops and exhibit halls to promote educational opportunities in transportation and logistics at NDSU. We also work with the graduate school marketing staff as we attend multiple graduate fairs across the United States to promote graduate programs at NDSU.

PROGRAM CHALLENGES AND NEEDS

Enrollments in the managerial logistics and transportation and urban systems programs are below target levels, but are steadily increasing. Enrollments should be increased to at least 30 students in each degree program for them to be viable in the long run.

As enrollments have increased for the Ph.D. program, the number of different faculty participating on dissertation committees has not similarly increased. The result is the same number of faculty advising a growing number of students. Further, most of the recent growth in the doctoral program has been in the logistics and supply chain systems specialization, concentrating the increased demand for advisers in that area.

Without tenure-track positions for some transportation and logistics faculty, retention of high-quality faculty is a challenge. Recently, some highly qualified faculty members have left the transportation institute, primarily because other schools can offer them tenure-track positions.

Currently eight of 39 doctoral students have been in the program more than five years. Though the priority must remain on producing high-quality dissertations, the fact that roughly 20 percent of the students take more than five years to complete their program of study poses a challenge. The common written preliminary qualifying exam, the tracking form for TL 899 Dissertation credits and the student handbook should help students progress through the program more rapidly.

PROGRAM GOALS FOR THE NEXT YEAR

New affiliate faculty designations have been instituted by the Graduate School. Applications for affiliate graduate faculty status have been submitted for all non-tenured faculty members who currently, or may potentially, participate in the program. Approval of these applications is a priority for the 2015-16 academic year.

Expand the use of faculty designations for qualified faculty wishing to participate in the program.

Continue to increase enrollments in the transportation and urban systems and managerial logistics programs and make progress on reaching the short-term goal of 20 students in each program.

Monitor the impact of the common written preliminary qualifying exam, the tracking form for TL 899 Dissertation credits and the student handbook, especially as they relate to students' progress through the program.

Work with the select committee established by the provost to assess potential academic homes for the program.

LONG-TERM GOALS

Grow enrollment in the managerial logistics and transportation and urban systems degree programs to have 40 students in each. This scale will make efficient use of resources.

Determine a solution to the lack of tenure-track faculty positions for the program. This will be critical in attracting and retaining high-quality faculty.

Get the Classification of Instruction Program classifications of "Transportation Management/Mobility" and "Logistics" approved as STEM disciplines.

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