

STUDENT SUCCESS AND LEARNING

Objective: Increase graduate student enrollment

Metric: Number of new funded TA positions (10-15 positions)

Strategy	Tasks	Metric	Time Frame	Responsibility
Continue to make case for increased TA positions to aid student learning in undergraduate courses	Continue to consider resource allocation and lobby for new resources to support TAs.	Amount of new resources for positions developed.	By 2020	Chair
	Seek programmatic NSF support in ways that contribute to growth of graduate program.	Two programmatic NSF grant proposals, or one successful programmatic grant proposal.	By 2020	Chair and Faculty

Objective: Reduce time to degree and attrition rates for graduate programs and improve placements for doctoral students

Metric: Reduce average time to degree for doctoral students to under 5.5 years, at least 85% placement for doctoral graduates by 2020.

Strategy	Tasks	Metric	Time Frame	Responsibility
Continue efforts to recruit quality students	Develop resources to fund graduate health insurance	Dollar resources invested in graduate health insurance	By 2020	Graduate School
	Continue advertising through visits to regional institutions.	Number of recruiting visits annually to regional institutions	Annually	Graduate Recruiting Chair and Faculty
	Continue advertising selectively through department mailings.	Number of graduate recruitment mailers annually	Annually	Graduate Recruiting Chair
	Continue participation in AMS Grad School Fair at Joint Mathematics Meeting	continued participation in AMS Grad School Fair at Joint Meetings	Annually	Graduate Recruiting Chair
	Continued advertising in AMS Graduate Program Web Site	continue advertising in AMS Graduate Program web site.	Annually	Chair
	Increase quality of recruited students	Increase in number of applications year to year.	Annually	Graduate Recruiting Chair and Faculty
Improve mentoring for new students	Completion of report evaluating	Completion of report;	Report by 2017,	Graduate

	procedures to improve student success on Preliminary Exams, with implementation of recommendations	Percent Success on Preliminary Exams.	implementation by 2020	Committee
Remove barriers to successful completion	Completion of report evaluating barriers to success in PhD program, with recommendations for improvement	Report from Graduate Committee to Department.	Report by 2017, implementation by 2020	Graduate Committee

Objective: Strategically increase undergraduate student enrollment

Metric: Increase in Math and Math Ed majors by 10%

Strategy	Tasks	Metric	Time Line	Responsibility
Streamline math and math ed major	Receive approval for updated math and math ed curriculum	Successful approval of proposed program	By 2017	Chair
Continue recruitment activities	Continued support for Math Club and related activities	Attendance at Math Club and participation in math opportunities	Annually	Undergraduate Affairs Committee
	Advertise at regional high schools	Number of mailers sent to regional schools	Annually	Chair
Investigate "majors" course at introductory level	Investigate course delivery systems for lower level course to recruit students into major	Ongoing discussion at department meetings on proposed courses	By 2018	Chair and Curriculum Committee

Objective: Improve undergraduate graduation rates

Metric: Improved student success in lower level (Math 98-Math 166) math courses, decrease of DFW rates by 10% by 2020.

Strategy	Tasks	Metric	Time Line	Responsibility
Consider strategies to increase student success in Calculus courses	Study student success in Calculus with a focus on data, national best practices, and department policies	Completion of report analyzing student success in Calculus with recommendations for improvement and analysis of resources needed	By 2017	Calculus Student Success Committee
Increase active learning in pre-calculus courses	Provide mentoring and training opportunities for grad students	Percent of students and lecturers engaged in	Annually	Chair

	and lecturers on active learning	active learning training opportunities		
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OUTREACH AND ENGAGEMENT

Objective: Improve communication with citizens of North Dakota

Metric: Number of interactions with citizens of North Dakota (broadly defined)

Strategy	Tasks	Metric	Time Line	Responsibility
Engage K-12 students regionally in mathematics activities	Develop strategy for outreach to K-12 students that includes classroom visits at all levels, advertising to K-12 students, and other activities	Completion of strategy development	By 2017	Outreach Committee
	Focus on increasing participation in Sonya Kovalevsky Day	Number of students participating in SK Day	Annually	Outreach Committee
	Continue investing in Governor's school	Number of Math students in Governor's school	Annually	Mohamed and Faculty
Modernize webpage	Complete modernization of web page	Completion of ongoing project	Ongoing	Math IT Liaison

Objective: When appropriate tie research mission to needs of North Dakota

Metric:

Strategy	Tasks	Metric	Time Line	Responsibility
Continue to participate in Higher Ed Task Force in support of mathematics education	Regular participation in the initiative going forward		Ongoing	Chair and Faculty

RESEARCH AND DISCOVERY

Objective: Increase research strength in focused areas of excellence

Metric: Number of faculty participating in areas of excellence initiatives

Strategy	Tasks	Metric	Time Line	Responsibility
Actively seek collaborations in focused areas of excellence	Engage other departments in "matchmaking" opportunities.		Ongoing	Chair
	Investigate creation of Math Resource Center to consult on mathematics related to faculty research	Completion of report analyzing such centers at peer institutions	By 2018	Chair
Maintain and expand a corps of mathematical researchers whose research is at the forefront of the most important areas in pure and applied mathematics	Increase faculty, post-doc, and graduate student positions	Number of new faculty, post-doc, and graduate student positions	By 2020	Chair and Faculty

Objective: Increase national prominence of NDSU as a research university

Metric: Faculty participating in national and international meetings, publishing in peer-refereed journals and conference proceedings, and organizing for conferences

Strategy	Tasks	Metric	Time Line	Responsibility
Maintain current publication rate and exposure	Continue submissions to peer-refereed journals and conference proceedings	Number of peer-refereed papers accepted per faculty	Ongoing	Faculty
		Number of faculty participating in national and international meetings	Ongoing	Faculty
Continue to support post-doctoral program in the department	Increase number of post-docs supported by the department, by at least one	Number of post-docs	By 2019	Chair
		Number of applications for post-doctoral positions		
Increase stature as mathematics program	Host conference or mini-conference on an annual basis	Number of visitors attending conference in department	Annually	Faculty and Dean

Objective: Increase NDSU's research capacity

Metric: New positions and postdoctoral positions to support current areas of strength/need in the department

Strategy	Tasks	Metric	Time Line	Responsibility
Increase number of tenure-track and post-doctoral faculty	Lobby for new resources to department for positions	Number of new positions	By 2020	Chair
Reduce non-research commitments of current faculty	Continue implementing teaching reductions for research active faculty	Number of course reductions annually	Ongoing	Chair
Increase research expenditures by faculty	Increase grant dollars solicited by faculty members as PI (or co-PI) on proposals	Grant dollars solicited per faculty member	By 2020	Faculty

Objective: Improve campus climate

Metric: Maintain current and aim for increase in students, graduate student, post-docs, and faculty from under-represented groups in mathematics

Strategy	Tasks	Metric	Time Line	Responsibility
Continue to support faculty and students from under-represented groups in mathematics	Support for faculty-led Women in Math group and AWM membership	Number of students and faculty participating in WIM activities	Ongoing	Chair and Faculty
	Continue supporting FORWARD Allies program	Percent of faculty trained as Allies		Chair and Faculty
Continue efforts to broaden hiring pools to include member from under-represented groups in mathematics	Increase opportunities for members of under-represented groups to be hired by the department	Percent of telephone interviews by members of under-represented groups in mathematics	Ongoing	Search Committees
Continue recruiting graduate students from under-represented groups in mathematics	Increase pool of potential grad students to include members of under-represented groups	Number of applications from members of under-represented groups for graduate school	Ongoing	Graduate Recruitment Chair
Minimize faculty resources and time used on processes and reporting that is secondary to the teaching and research mission of the University	No more department level reports/proposals that will have little impact on improving the department	Reduction in number of reports/proposals	Ongoing	Upper Administration

GOALS

Student Success:

- Increase Graduate TA positions by 10.
- Decrease DFW rates in Math 98-166 by 10%.
- Decrease time to degree for graduate students to an average of under 5.5 years.
- Increase Math + Math Ed majors by 10%.
- Maintain current time to degree for Math and Math Ed majors.

Research and Creative Activity:

- Regular submission of programmatic proposals to NSF to support graduate program.
- Increase research faculty by 1 to increase overall research activity.
- Increase post-doctoral positions by 1 to increase overall research activity.
- Decrease teaching loads to 2-1 consistent with the typical research university.
- Maintain current accepted papers per faculty member.
- Increase grant dollars solicited as PI or co-PI.
- Regularly host mini-conferences to support research faculty.

Hiring Plan for 2017-2022

Consistent with our department's efforts to reduce the teaching commitment for research-active¹ faculty to a 45%-teaching, 45%-research, and 10%-service load², the department's hiring plans for the next five years includes the following:

- Increase from 17.5 to 21.5 tenure-track faculty
- Addition of 2 "permanent"³ post-doc positions

In addition, our strategic plan calls for an increase in graduate student positions, leading to the following:

- Increase from 6 to 8 the number of teaching fellow positions in the department.
- Increase from 25 to 32 the number of funded teaching assistant positions.

Finally, the strategic plan calls for focusing efforts in remedial courses, to improve student success:

- Maintain 3 lecturers funded by the department to focus on pre-calculus courses.
- Invest in learning assistants for Math 144, 146, and 165.

In addition to the numbers listed above the department will focus on developing the following research areas in hires going forward:

- **Combinatorial statistical physics**
Combinatorics is the study of discrete structures. These arise naturally in statistical physics, which discovers macroscopic/emergent behavior of physical systems given the local governing rules/forces. Some such systems stem from properties of nature while others are mathematical constructs whose study is a necessary step toward understanding more complicated real-world systems.
- **Interactions between dynamical systems and number theory**
The study of dynamical systems has been a central piece in several key advances in number theory over the past ten years. By investigating a number theory object using dynamical systems (i.e. using group actions on the number theory object) one gains insight both into dynamics and into the underlying sets.
- **Optimal control and estimation with applications.**
We are going to study problems of optimal control and estimation and their applications to automatic control systems, systems with delays, adaptive control, power systems, mathematical finance, and health models.

¹ The definition of research active is as follows: Faculty who have received a rating of "Meets Expectations" on their previous two annual evaluations in the area of research, teaching, service, and collegiality. See the document "An Outline for Faculty Evaluation" for a discussion of expectations for faculty evaluations.

² See the department document "Workload Policy".

³ By "permanent" we mean a permanent line that will be filled by post-docs limited to three years in the position, who will be supervised by current faculty.