Department of Physics, North Dakota State University:
Strategic Vision for 2022/23-2027/28

Student Learning, Success and Achievement

Objective: Increase graduate student enrollment.
Metric: Increase number of PhD students from 15 in 2021/22 to 20 by 2027/28.

Strategy	Tasks	Metric	Responsibility
Increase number of GTA positions to 8 by 2027/28, increase GTA assistantship to $22K, support health insurance, seek to secure additional private donor support	Prioritize use of departmental funds to support GTAs, allocate salary savings toward the increase of appropriated GTA funds, establish relationships with potential donors	Number of GTA positions and dollar amount of assistantship	Department Chair, Graduate Committee
Increase visibility and appeal of Department to current and prospective graduate students	Maintain permanent presence at GradSchoolShopper and improve webpage presence	Number of applications to graduate program	Graduate Committee
Develop recruitment channels for graduate students	Continue recruitment seminars at local physics departments (MSUM, UND); develop Annual Undergrad Research Conference into recruitment platform	Number of applications to graduate program	Graduate Committee, Outreach Committee

Objective: Increase success and graduation rates of graduate students.
Metric: Achieve average annual graduation rate of 2 PhD students by 2022/23-2027/28.

Strategy	Tasks	Metric	Responsibility
Provide professional development support for all graduate students	Allocation of Summer School revenue	80% of graduate students in 2nd year and higher present at conferences	Student advisors, Department Chair
Mentor and support activities of Graduate Student organization (Grad Phi)	Allocation of support from Department budget, develop mentorship	Budget allocations, number and quality of Grad Phi activities	Graduate Committee, Department Chair
Provide interested graduate students with summer teaching opportunities	Coordinate summer courses, identify and mentor instructors, recruit students	Annual revenue from Summer School	Curriculum Committee, Graduate Committee

Objective: Increase enrollment of undergraduate students in Physics.
Metric: Increase number of Physics majors (including dual majors that involve Physics) to 60 by 2027/28.

Strategy	Tasks	Metric	Responsibility
Cultivate job prospects in industry for Physics majors	Recruit promising students into dual major programs with ECE, ME, and CS; annually invite seminar speakers from industry	Number of students enrolled as dual majors in those programs	*Ad hoc* committee
Advertise our program at regional high schools	Invite interested student groups from local high schools to visit the Department	Frequency and number of students visiting	*Ad hoc* committee
Advertise Department strengths	Use meetings with prospective students and outreach events as recruiting opportunities	Enrollment of prospective students	Chair
Develop Department webpage into recruiting tool	Focus on prospective students, produce and incorporate advertising videos and banners, collaborate more with Publication Services	Webpage feedback from prospective students	Webpage Committee
Develop and offer online service courses and labs	Solicit necessary resources (Professor of Practice position, more GTAs, lab materials)	Courses offered, students enrolled and graduated	Department Chair and faculty

Objective: Ensure Physics majors graduate in timely fashion and are prepared to be successful after graduation.
Metric: Graduate seven or more Physics majors per year and ensure that all are highly qualified to secure employment in industry or positions in graduate programs.

Strategy	Tasks	Metric	Responsibility
Make our student advising model more inclusive and focused	While advising of academically strong students is excellent, we need to extend this to all students.	Use Navigate to document student-advisor meetings	Curriculum Committee
Develop models and methods for student career preparation	Offer specific sessions on career development outside course work	Monitor employment after graduation	SPS faculty mentor
Assist students in applying to summer internships and external research programs	Work with Career Center to better advertise internships and REUs, establish culture of applying	Number of students in summer internships and research programs	Entire Department
Continue to provide support for undergraduate students to effectively use their learning space in SE 108	Work with Society of Physics Students to understand student needs and provide funds to equip SE 108	Feedback from Society of Physics Students and from individual students	SPS faculty mentor, Department Chair

Objective: Establish a culture of incorporating undergraduate students early into research projects.
Metric: 70% of all majors perform research with faculty before senior year; 30% graduate with authorship in publication.

Strategy	Tasks	Metric	Responsibility
Provide and promote research opportunities for undergraduate students from freshman year on	Collect projects from faculty and advertise using web pages, email, and SPS meetings	Number of undergraduate students involved in research projects	Outreach Committee, SPS faculty mentor, Webpage Committee
Reward successful undergraduate research	Featuring successful projects on webpages; Department ceremony for undergraduate research award; Annual Undergraduate Research Conference, Undergraduate students present research results at conferences/meetings/seminars	Number of publications with undergraduate students, number of research presentations (posters, talks, seminars) given by undergraduate students	Research-active faculty, Nominations Committee, Outreach Committee

Objective: Improve undergraduate success in large-enrollment service courses (Phys 110, 120, 211, 212, 251, 252); reduce DFW-grades to 10% by 2027/28.
Metric: Measure learning gains in student assessment, impact of the gains on reduction of DFW-grades.

Strategy	Tasks	Metric	Responsibility
Engage students in large-enrollment service courses, promote student learning	Facilitate adoption of active-learning methods, support faculty access to LAs, use expertise provided through Gateways-ND	Measured learning gains in student assessment, solicited student feedback about level of engagement	Course instructors, Curriculum Committee, Department Chair
Provide students with additional help tailored to the needs of Physics service courses	Assign a GTA as support to form and mentor learning groups; initial task: assign one GTA for all courses with more than 200 students	Reduction of DFW-grades to less than 10%	Graduate Committee, Department Chair
Transform instructional approach of teaching physics for students with life science background	Create new or adjust current course work	Success of students with life science background in new or adjusted courses	Curriculum Committee in collaboration with other departments

Research, Scholarship and Creative Activities

Objective: Increase departmental research impact.
Metric: Rankings of Department according to Academic Analytics; exceed 30 journal publications per year.

Strategy	Tasks	Metric	Responsibility
Strengthen our networks of research collaborations	Provide funds to invite external collaborators and high-profile researchers through Department seminar	Number of joint publications, number of successful new collaborations	Research-active faculty, Seminar Coordinator
Increase number of publications, especially in top-tier journals	Publish more than 30 journal papers annually (3 per faculty on average), 75% in top-tier journals (Quartile 1 according to SJR)	Web of Science, Academic Analytics	Research-active faculty
Recognize crucial role of graduate students for research success; create Department culture of graduate student excellence	Increase visibility of Darrell and Carol Strobel Awards as highest recognition of graduate student excellence	Webpage, personalized plaques, award ceremony	Nominations Committee
Recognize importance of publications in high-impact journals	Attempt to publish at least one article in journal with SCImago Journal Rank above 4	Submission of at least one high-impact paper	Research-active faculty

Objective: Achieve funding levels that enhance research output and impact of Department.
Metric: Measure of success results from annual evaluation and is specific for each faculty member:
appropriate funding level provides full support of research activities and research group (with focus on graduate students).

Strategy	Tasks	Metric	Responsibility
Continuous growth of research expenditures	Submit competitive proposals to funding agencies	Number and support level of funded proposals	Research-active faculty
Align departmental research with institution-wide goals	Work toward establishing inter-disciplinary, institution-wide research collaborations	Number of joint proposals with NDSU faculty	Research-active faculty
Increase competitiveness of submitted proposals	Develop mentoring program for faculty with insufficient grant support or submission activity	Proposal funding rate	Research-active faculty, Department Chair

Objective: Reward faculty for excellence in research.
Metric: Number of award nominations and funds for recognition of research excellence.

Strategy	Tasks	Metric	Responsibility
Reward Department for striving toward excellence in scholarship	Provide professional development support for faculty	Annual Professional Activity Reports	Department Chair
Recognize research excellence	Nominate faculty for research awards, display news items on webpage, featuring successful faculty research	Number and visibility of awards; continuous update of webpage news items	Nominations Committee, Webpage Committee

Diversity, Inclusivity, Respect, Engagement and Outreach

Objective: Diversify undergraduate and graduate student body and faculty, as openings arise.
Metric: Attract underrepresented minority (URM) and women students, successfully graduate 90% of women and URM Physics majors, 50% of new faculty hires until 2027/28 are URM or women.

Strategy	Tasks	Metric	Responsibility
Diversify graduate student body	Maintain status of APS Bridge Program Partnership Institution, giving access to national database of URM students who plan to pursue graduate studies in Physics	Number of applications from URM students	Graduate Committee
Support success of women undergraduate physics majors	Offer full support to attend APS Conferences for Undergraduate Women in Physics (CUWiP)	Number of students attending CUWiP	Department Chair
Integrate new faculty into national discussions about diversity in physics	Provide support for new faculty to participate in APS New Physics and Astronomy Faculty Workshop	Fraction of new faculty attending	Department Chair
Increase recruitment and retention of women undergraduate students	Encourage the formation of a Women Undergraduate Physics student group	Group formed	Department Chair

Objective: Create a culture of engagement for faculty and students.
Metric: Number and success of outreach and student-engaging events.

Strategy	Tasks	Metric	Responsibility
Participation in the University Physics Competition	Departmental support of the event; mentorship by faculty	Number of teams that participate every year	SPS faculty mentor, Department Chair
Provide educational outreach to K-12 students	SPS helps organize Science Fun Night; students and faculty participate in Science Fair and Science Olympiad; graduate students participate in Avenues of Scientific Discovery event	Success of events as measured by feedback from students and parents	SPS faculty mentor, faculty
Maintain excellent relationships with local Physics departments	Continue annual get-together with faculty from MSUM and Concordia College, meet with UND faculty at annual poster session	Feedback from faculty at local Physics departments, number of collaborative projects	Outreach Committee, Department Chair

Objective: Maintain high level of service to the profession.
Metric: At least 50% of faculty engage in leadership positions in professional organizations, as journal editors or in editorial boards, as reviewers for national agencies, textbook and monograph writing, etc. (metric applies every year).

Strategy	Tasks	Metric	Responsibility
Maintain high level of involvement at professional organizations, editorial work, proposal evaluation, paper reviewing, textbook writing	Recognize time commitment for faculty to perform service to profession	Faculty continue service to the profession and engage in leadership positions	All faculty, Department Chair