GRADUATE HANDBOOK
APPLIED PHYSICS PROGRAM

Northwestern University

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Northwestern University
2024-2025

The Applied Physics Graduate Handbook supplements The Graduate School's policies and procedures. The following pages contain information about program-specific policies, procedures, and regulations. Students are subject to the regulations in effect at the time of matriculation. It is your responsibility as a student to be aware of the requirements and regulations by The Graduate School (as described on their website, https://www.tgs.northwestern.edu/academic-policies-procedures/policies/index.html#gsc.tab=0) and those stated in this Handbook.

Please note that Northwestern University reserves the right to change without notice any statement in this publication concerning, but not limited to, rules, policies, tuition, fees, curricula, and courses.

Contents

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II. PROGRAM MISSION AND LEARNING OBJECTIVES

a. Mission Statement

The Applied Physics graduate program is a cross-school program involving faculty from Northwestern's McCormick School of Engineering and Weinberg College of Arts and Sciences. The program is constructed to equip students with broad knowledge of the key principles of modern applied physics, and rapidly guide students toward original research. The program provides PhD students with opportunity, education, and mentoring to develop into a productive scientist within the two phases of education and scientific research activity. In graduate classes, students learn both fundamentals and develop specialized knowledge. In fulfilling teaching duties, PhD students practice their communication skills and their ability to effectively teach science. Through scientific activity, students become increasingly effective at advancing the knowledge in their particular area of research, at communicating their results to a broad audience through publications and oral presentations, and at becoming leaders of scientific thought. At the end of the program (i.e., normally the end of the fifth year of study), students are expected to submit and defend a PhD thesis that contributes new results to the body of scientific knowledge.

b. Student Learning Objectives of the Program

Learning objective(s)	Milestone/ Requirement	Assessment Strategies and Criteria
Contribute original research to scholarly community and apply appropriate research methodology and analyses, given particular research question.	Dissertation/ Research	Faculty committee assesses dissertation following a discussion of the expectations of the sub-field of the specific research, evaluating the demonstrated level of achievement by considering written thesis, oral presentation of the defense, and ability of the PhD candidate to answer relevant questions. The PhD candidate authors an original thesis that is consistent with standards of peer reviewed literature in the candidate's research area (e.g. defines appropriate methodology; delineates sources; adheres to scientific method); candidate gives oral presentation defining the advance in knowledge and possible broader impacts.
Create and communicate professional development plan.	Annual Academic Progress Review/Career Development	Student shares plan annually with advisor and Director of Graduate Study through annual academic progress review; Student seeks advice of faculty advisor and DGS on professional development, and identifies other professional development resources on campus as appropriate.
Develop classroom activities for a specific discussion section.	Teaching	Teaching assistant collaborates with professor and fellow TAs. TA conducts assessment of undergraduate knowledge.
Read, understand, and critically discuss topical scientific literature, and demonstrate expertise in underlying fundamentals.	Qualifying Exam (year 1)	Faculty committee evaluates student's educational progress and ability to apply learned knowledge based on oral presentation given by student and subsequent questioning period. Student gives brief and clear summary of reported results; demonstrates background knowledge; critically analyzes strengths/weaknesses of selected scientific literature, discusses open questions/future directions.
Give oral presentation of own research results to audience of peers & faculty. Articulate broader impacts of research.	Applied Physics Seminar Presentations (year 3)	Student presents and is able to answer pertinent questions from audience; Student seeks feedback from attending adviser / faculty; in preparation for next career steps, seminar presentation in year 5 should have the quality of a conference presentation / job talk.
Motivate/describe proposed research and highlight possibilities for discovery and advancement of knowledge.	Thesis Proposal and Defense (year 3)	Faculty committee assesses written research plan and evaluates the student's oral presentation and defense of achieved research results and future steps. The PhD candidate authors an original prospectus document, providing background/context of research, discussing previous research achievements and describing coherent research plan; gives oral presentation; answers questions from audience and committee; defends research plan.

III. NONDISCRIMINATION STATEMENT

Please access the University's non-discrimination statement here.

IV. STUDENT RESPONSIBILITIES

The responsibility for meeting published deadlines and degree requirements rests with the student. The Northwestern University Academic Calendar is available at https://www.registrar.northwestern.edu/calendars/index.html .

The Graduate School deadlines and requirements can be found on their website at https://www.tgs.northwestern.edu/academic-policies-procedures/index.html .

Program-specific deadlines are stated explicitly in the following sections.

V. ADVISOR SELECTION AND ADVISOR'S ROLE

a. The Selection Process

Incoming students are responsible for selecting a research advisor during the Fall Quarter of their first year. In the first weeks of that quarter, students take steps to meet faculty members in Applied Physics (a list of Applied Physics faculty members can be found on the program's website: https://appliedphysics.northwestern.edu/people/faculty/index.html). One-on-one meetings between students and potential advisors are important as they aid the faculty in evaluating the qualifications of a given student. Faculty members conduct research over a wide spectrum of areas in applied physics, and incoming students are encouraged to explore the options. Note that the availability of specific research projects and advisors is in part governed by the presence of funds to support that research. At the end of the process, the student makes an agreement with an Applied Physics faculty member to become their advisee.

Important: Each student must enter the information on the GSTS website. The student must select their advisor and send them an invitation through GSTS. The invitation has to be accepted by the advisor by November 27.

If a student has not found an advisor and the deadline is approaching, he/she should contact the Director of Graduate Studies as soon as possible for assistance. In rare instances, a change of advisor may be necessary due to loss of funding or for other reasons. The Director of Graduate Studies handles such situations on an individual basis.

b. The Faculty Advisor's Role

PhD advisors are responsible for directing their advisee's research project and providing mentoring for the student on a regular basis. Advisors should ensure that the student meets academic standards expected to progress towards a PhD in Applied Physics Program.

The advisor provides advice concerning the student's graduate studies and must be consulted about course selection, especially for elective courses. The advisor further guides the student's

thesis research in a manner appropriate to the specific stage of a student's graduate career. The advisor serves as a committee member on the student's Qualifying Exam committee, and as the chairman of the faculty committee that conducts the Thesis Proposal and Defense (Prospectus) and the final Thesis Defense.

VI. PhD DEGREE IN APPLIED PHYSICS

a. Course Load

Course units, 499 units (Independent Study), and 590 units (Research) must total to at least three each quarter (see the TGS website for more detailed requirements as well as restrictions on 499 and 590 registration).

b. Research

Graduate study is full-time employment. Students are expected to be fully involved in research under the supervision of their advisors.

c. Academic Standing

Criteria for Satisfactory Academic Progress

TGS sets the minimum standard for satisfactory academic progress. There are three sets of criteria that The Graduate School takes into account in determining whether or not students are making satisfactory academic progress:

Program length. The Applied Physics Graduate Program expects students to complete their studies and research for the PhD in five years. The Graduate School imposes the following requirements. Doctoral students must complete all requirements for the PhD within nine years of initial registration in TGS. Students who do not complete degree requirements by the established deadlines will not be considered in good academic standing, will be placed on probation, and will be subject to TGS 512 (advanced continuous registration).
Grades and cumulative GPA. Students must pass the classes of the Applied Physics Curriculum and make satisfactory research progress. Academic progress is reviewed annually. Students must submit academic progress reports via GSTS before the end of each Summer Quarter, have their advisors review and approve their reports via GSTS, and obtain the final approval by the Director of Graduate Studies via GSTS. A student whose overall grade average is below B (3.0 GPA) or who has more than three incomplete (Y or X) grades is not making satisfactory academic progress and will be placed on probation by TGS.

Internal milestone deadlines. Applied Physics students must pass the Qualifying Exam by the end of the Spring Quarter of their first year, pass the Thesis Proposal and Defense (Prospectus) by the end of the Spring Quarter of their third year, and pass the Final Thesis Dissertation Defense.

Students failing to meet the requirements of satisfactory academic progress are placed on academic probation, and are informed of this status by TGS and/or the Director of Graduate Studies. Students are given two quarters (not including the summer quarter) to resolve a GPA-based probation status. Academic Probation due to failure to pass the Qualifying Exam or the Thesis Proposal and Defense by the respective deadlines must be resolved by passing the Qualifying Exam

or Thesis Proposal and Defense by the end of the Summer Quarter immediately following the Spring Quarter of the first year of study.

Failure to establish satisfactory academic standing within the given time frame may result in exclusion (dismissal) of the student from the program, following the rules put forward by TGS.

Academic Standing.
PhD students must identify a research advisor by the end of their first quarter. A student without a research advisor after the first quarter may be considered to be in unsatisfactory academic standing and risks dismissal from the program.

d. Course Requirements

According to University policy, students must maintain a 3.0 GPA to receive financial assistance and to maintain satisfactory academic progress. GPAs are calculated according to the following scale: A = 4, A- = 3.7, B+ = 3.3, B = 3, B- = 2.7, C+ = 2.3, C = 2, based on the grades that appear on the graduate student's transcript.

All students must complete the following 9 courses and two electives. All students need to be registered full-time (no fewer than 3 and no more than 4 course units of credit per quarter). When less than 3 graded course units are taken, students must register for APP PHYS 590 Research for 1–3 units (or for APP PHYS 499 Independent Study if appropriate), in consultation with the advisor and approval of the DGS. Students in third year and beyond should register for TGS 500: Advanced Doctoral Studies.

First-year courses

Fall

1a. MAT_SCI 401-0: Chemical & Statistical Thermodynamics of Materials
or PHYSICS 416-0: Introduction to Statistical Mechanics (Winter year 1)*
2. PHYSICS 411-1: Methods of Theoretical Physics
3. PHYSICS 412-1: Quantum Mech
4. GEN_ENG 519-0: Responsible Conduct of Research Training (required but not for credit)

Winter

5. PHYSICS 412-2: Quantum Mechanics
6. PHYSICS 414-1: Electrodynamics
1b. PHYSICS 416-0: Introduction to Statistical Mechanics
or MAT_SCI 401-0: Chemical & Statistical Thermodynamics of Materials (Fall year 1)

Spring

7a.MAT_SCI 405-0: Physics of Solids
or PHYSICS 422-1: Condensed-Matter Physics (Fall of year 2)

* If students choose to take PHYS 416 in the winter of year 1, they should pick a computational or experimental methods of Applied Physics course or an elective in fall of year 1, instead of MAT SCI 401.

Second-year courses

Fall
7b. PHYSICS 422-1 Condensed-Matter Physics
or MAT_SCI 405-0 Physics of Solids (Spring of year 1)

When available and by the end of the third year
8. Graduate-level Computational Methods of Applied Physics course
9. Graduate-level Experimental Methods of Applied Physics course

Elective 1 – Graduate level class - must be taken by end of year 3
Elective 2 - Graduate level class - must be taken by end of year 3

Third year and beyond

TGS 500: Advanced Doctoral Studies

Computational and Experimental methods of AP

Students choose courses matching the requirements of a graduate-level class covering computational techniques and laboratory techniques from the class offerings of departments participating in the Applied Physics program. A list of suitable course options satisfying the requirements is available on the Applied Physics Graduate Program webpage here. If a student wishes to substitute a class that is not on this list, the substitute course must be approved by the Director of Graduate Studies.

Electives

In addition to the nine courses listed above, at least two elective courses (400-level) must be taken before the end of the third year. Those two electives are chosen in consultation with the student's research advisor. They must be chosen from 400-level courses listed in the course catalog of the departments participating in the Applied Physics Program. Note that certain 300-level courses can be counted as a graduate-level course; check with the Director of Graduate Studies to approve a 300 level course as an elective. Students may take additional electives and should consult their research advisor prior to registration.

Waiver of Courses

Students who are sufficiently prepared in the subject matter of a required course may request a waiver. Waivers must be approved by the instructor of the course as well as the Director of Graduate Study. The instructor may require documentation, e.g. text used in prior course, course outline, lecture notes, exams, etc., and/or conduct an oral or written examination.

Important: Course waivers do not count toward the total number of 9 letter-graded graduate courses, which are required for every graduate student.

International Students: Linguistics classes

International students may take Linguistics 380, Spoken English for Non-Native Speakers, Linguistics 381, Written English for Non-Native Speakers and Linguistics 480, American Academic

Culture in place of units of 590. These courses, however, do not count toward the courses required for the PhD. Students are advised to consult their research advisor before registering for language courses.

e. English Language Requirement

International students (except those from Australia, Canada, New Zealand, or the United Kingdom) are required to take and pass the Versant test in fulfillment of the English proficiency testing requirement for international PhD students mandated by The Graduate School. (Additional ways of fulfilling the language requirements are listed on the corresponding TGS site https://www.tgs.northwestern.edu/funding/assistantships/graduate-and-teaching/index.html .)

Passing the Versant test has proven to be challenging for some international students. Students whose first language is not English are advised to take every opportunity to converse with others in English. The complete English Language Programs offering can be found at https://www.elp.northwestern.edu/services/group-language-classes.html . Please note particularly the Spoken English for Non-native Speakers (LING-380).

Valuable resources for improving English language skills are offered through the Linguistics department: https://www.elp.northwestern.edu/ . For those who wish smaller conversation groups, tutors are also available through the Community Council for International Students (CCIS). For more information on these opportunities, visit their website at https://www.northwestern.edu/international/about/programming-events/community-council-for-international-students/ .

f. Teaching Assistant (TA) Requirement

Whether students intend to follow careers in academia or in industry, presentation skills and the ability to function in a question and answer setting are invaluable.

PhD students are required to serve as teaching assistants during their graduate studies. Students sign up as TAs for classes with sufficient enrollments or laboratory requirements, taught in one of the departments participating in the Applied Physics program. Assignments vary in the number of hours per week and in tasks required (grading, office hours, assisting in lectures, etc.). Each doctoral student is required to serve as a full-time TA (graderships are insufficient, required are at least 10 hours/week) for at least one quarter depending on the workload of the course and the experience gained. Students generally serve as TAs between their second and fourth years in the program, and should consult their research advisor on the appropriate timing. The Applied Physics Program Assistant can help find TA opportunities and needs to be notified by the student when the TAship is confirmed for funding purposes.
Prospective TAs are strongly encouraged to attend the training sessions offered by the Searle Center for Teaching Excellence (https://www.northwestern.edu/searle/initiatives/calendar.html). Students will not necessarily assist in courses taught by their advisor. Because the workload necessarily varies between courses, students must contact the faculty teaching the course and gather information about TA responsibilities before enrolling as TA.

g. The Qualifying Examination

The Qualifying Exam evaluates a student's knowledge in Applied Physics based on the classes taken in year 1, their presentation skills, and his/her ability to understand, put into context, and critically discuss selected research topics and research papers. Students must take the Qualifying Examination by the end of the Spring Quarter of their first year.

i. Qualifying Examination: Committee and Exam Format

The Qualifying Exam takes the form of a presentation made to an examination committee followed by a closed session question and answer period before the committee. The length of the exam is nominally one hour, but the duration may be extended at the discretion of the examination committee.

Committee: The examination committee consists of three members, or four members in the case of co-advised students. The Applied Physics Graduate Program assigns one faculty member as the chair of a student's qualifying exam committee. The second member of the examining committee is the student's research adviser. The third member is selected by the student and their adviser. When committee members are identified, the student records the committee makeup on the GSTS website.

Format: The student gives a 30-minute presentation on a topic that is distinct from the student's past and present research, and selected from the literature within the past 5 years on research done outside Northwestern University. It should **NOT** be on the student's planned thesis topic, but rather on a field of research that complements it. It should also NOT be related to any research the student might have done as an undergraduate. The presentation should be based on a paper, or a series of related papers on the same topic. It should describe the reported results and provide a critical perspective and review of the research findings. It is also important that the student takes the time to understand any background material germane to your topic. This includes relevant literature and the underlying basic physical concepts. The presentation must be based on the student's independent analysis of the papers. Therefore, extensive feedback on its scientific content by committee members should not be provided prior to the exam. The presentation must be original; slides prepared by others may not be used.

The oral presentation is followed by a closed session with the committee covering the presentation, content of the research, publications, and topics that explore the student's knowledge and readiness for research, including knowledge based on the first-year graduate course work.

ii. Qualifying Examination: Outcomes

The possible outcomes of the qualifying examination are:

(1) *Pass*: The student is then recommended to the Graduate School for candidacy for the Ph.D. degree.

(2) *Conditional Pass*: The Qualifying Examination Committee may pass a student subject to additional conditions (such as English proficiency) to be satisfied within specified time limits. Once these conditions are met, the student will be recommended to the Graduate School for candidacy for the Ph.D. degree.

(3) *Fail*: The Qualifying Exam Committee finds the performance of the student unsatisfactory. The student is placed on academic probation and has the opportunity to retake the Qualifying Exam before the end of Summer Quarter of the first year. A student who fails the Qualifying Exam twice will be excluded from the Program.

iii. Qualifying Examination: Scheduling

The date of the qualifying exam is set by the student in consultation with all committee members and the DGS. The exam must take place during the Spring Quarter of the first year. The student is responsible for reserving an appropriate room for the exam. The room should be reserved for 90 minutes even though the exam typically lasts one hour. The title of the oral presentation, as well as copies of the scientific publications to be discussed in the oral presentation, must be submitted to the committee and the Applied Physics Program Assistant two weeks prior to the date of the exam.

If the student fails the qualifying exam and chooses to retake the exam, a second attempt must be scheduled before the end of the Summer Quarter of the first year. Students who do not pass the Qualifying Exam by the end of the first academic year are excluded from the Applied Physics program.

h. Interim Master's Degree

The Applied Physics Program does not offer a terminal Master's program, and only students who intend to pursue the PhD are admitted. However, PhD students who satisfactorily complete the required AP courses and pass a comprehensive examination are eligible to receive a Master of Science degree.

i. Thesis Proposal and Defense (Prospectus)

Students must present and defend their dissertation proposal (prospectus) by the end of the Spring quarter of their third year.

i. Prospectus: Committee and Prospectus Format

Committee: Students form a committee of three faculty members, two of whom, including the advisor, must be members of the Applied Physics faculty. If the student has two co-advisors, the committee will consist of four faculty members. The student records the makeup of the committee on the GSTS website before the date of the prospectus.

Format:

Written Proposal: Students must submit a written thesis proposal to their committee and the Applied Physics Program Assistant at least 14 days prior to the date of the prospectus. The written proposal should be approximately20 pages (double-spaced, including references). The proposal must include a title, abstract, introduction and a review of the relevant literature. The document should motivate and describe the proposed research, and highlight the possibilities for discovery and advancement of knowledge.

Oral Defense: Students summarize their proposed research in an oral presentation that is nominally 30 minutes in length. Following the oral presentation, the committee may ask the candidate questions about the proposed research project.

ii. Prospectus: Outcomes

The possible outcomes of the Thesis Proposal defense are:

(1) *Pass*: The student may continue in the program towards the Ph.D. degree.

(2) *Conditional Pass*: The Committee may pass the student subject to additional conditions that must be satisfied within specified time limits. Once these conditions are met, the student may continue in the program towards the Ph.D. degree.

(3) *Fail*: The student cannot continue toward the Ph.D. degree. A student who fails the Thesis Proposal is recommended to consult with his/her advisor and the Directors of the Applied Physics Graduate Program to determine the best course of action following this result.

iii. Prospectus: Scheduling

The thesis proposal and oral defense must be completed by the end of Spring Quarter of the third year. The date of the defense is set by the student in agreement with the student's examination committee members. Students must submit their written thesis proposal to the committee members and the Applied Physics Program Assistant at least 14 days in advance of the defense, make an appropriate room reservation (1½ hour) and fill out the Prospectus form on the GSTS website when the date and time for the exam has been finalized.

j. The Thesis Defense/Final Examination

Each PhD candidate must pass a Thesis Defense based on the work presented in the candidate's dissertation. The faculty committee assembled previously for the thesis proposal and defense conducts the examination. The examination involves a mandatory open and publicized oral presentation and discussion during the first hour, followed by a closed examination with only the faculty committee. A conference room should be reserved for three hours by the candidate.

Procedure

1. As soon as the Candidate, in agreement with their advisor, has determined the quarter of their PhD thesis defense, they submit an "Application for a Degree" (AFD) form through the GSTS website.

2. The Candidate receives the advisor's approval that the dissertation is in final form and ready to be presented to the committee for review.

3. The candidate contacts their committee members to set date and time, and make a conference room reservation. The deadline for taking the exam and submitting the dissertation to the Graduate School varies each quarter. Consult the timetable on The Graduate School website for exact dates each year. A public notice of the thesis defense will be posted by the Applied Physics Graduate Program.

4. The Candidate supplies the names of their committee members to The Graduate School at least three weeks before the date of the thesis defense. The Candidate enters this information, as well as the date and title of thesis in the PhD Final Exam Form, on the GSTS website.

5. The format of the dissertation must conform to standards established by The Graduate School. The format is available on the TGS website: https://www.tgs.northwestern.edu/documents/policies/dissertation-format-guidelines.pdf . The Applied Physics Graduate Program

further requires that titles, and first and last page numbers be included in bibliography.

6. The Candidate must present each committee member with a copy of the dissertation at least two weeks prior to the date of the thesis defense.

7. Prior to departure from Northwestern University, the graduate must return borrowed items (theses, library books, etc.), properly dispose of all research chemicals, and leave a forwarding address with the Applied Physics Program office.

k. Degree Completion and Graduation

Students in Applied Physics are expected to complete their studies and research for the PhD within 5 years. TGS policy requires completion by the end of the 9th year of study.

To apply for graduation, students must complete the application for degree and final exam forms. More information can be found at https://www.tgs.northwestern.edu/academic-policies-procedures/policies/phd-degree-requirements.html .

Graduating students are invited to participate in a Hooding Ceremony. We encourage students to attend the TGS hooding ceremony. (Students may choose the McCormick hooding ceremony as an alternative.) For detailed information on the events, see https://www.tgs.northwestern.edu/academic-policies-procedures/graduation/index.html and https://www.mccormick.northwestern.edu/students/graduation/.

l. Academic Probation

A student who is not making satisfactory academic progress due to one of the reasons outlined in Section VI c will be placed on academic probation by The Graduate School and/or the program. When a decision to place a student on probation is made by The Graduate School, the student will be notified in writing, along with the program's Director of Graduate Study, and will be given at most two quarters (not including summer quarter) to resume satisfactory academic standing. The Graduate School notifies students of probation status on a quarterly basis. When a decision to place a student on probation is made by the Applied Physics Graduate Program, the student and The Graduate School will be notified in writing.

During the probationary period, students will remain eligible to receive federal and institutional assistance (except when they have exceeded their degree deadline). At the end of the probationary period, progress will be reviewed. If a student does not re-establish satisfactory academic standing during the two probationary quarters, the student will become ineligible to receive financial aid and will be excluded (dismissed) from TGS.

Petitioning for an extension to satisfy the minimum GPA

Students who have not achieved the minimum GPA requirement or exceeded their time to degree deadline, qualifying exam or prospectus milestone deadline and cannot re-establish good academic standing within the two quarter probationary period may petition TGS for an extension. The petition for an extension must contain the following information:

- The specific length of the extension including the exact date by which the requirement will be met. The extension time frame should be realistic.

- A detailed rationale for the extension
- A detailed timeline for meeting the new deadline including what work remains to be completed and the specific timeline, with proposed deadlines by which that work will be completed within the extension period
- A detailed letter of support for the extension from the Director of Graduate Study
- A detailed letter of support for the extension from the student's academic/research advisor

Exclusion (Dismissal)

The University defines “exclusion” in the Student Handbook. A student who fails to resume satisfactory academic standing after at most two quarters (excluding summers), and after being notified of placement on probation by The Graduate School, will be excluded from The Graduate School. Under certain circumstances, a student can be excluded by a program without first being placed on probation. This may occur only if: the criteria for exclusion have been stated clearly by the program and have been disseminated to the student effectively, and both the Director of Graduate Study and either the Chair of the student's advisory committee or the Co-Directors of the Applied Physics Program approve the exclusion.

Funding to support the student will cease on the effective date of the exclusion, unless special arrangements are granted.

Notification of Exclusion (Dismissal)

When TGS determines that a student is to be excluded, both the program and the student will be informed in writing (e-mail communication is considered to be “in writing”) within five business days of the determination. Similarly, when a decision to exclude a student is made by the program, both the student and TGS must be informed in writing within five business days of the decision. The exclusion (dismissal) notification must include the effective date of the exclusion and a clear statement of the reason(s) for exclusion.

Appeal Process

A student may appeal a program's decision to exclude (dismiss) the student to The Graduate School. To file an appeal of the program decision, students must submit a request in writing to the attention of the Director of Student Services within ten days of the date of the program's written determination of exclusion to the student, and include any supporting materials for the appeal at that time. If no appeal is filed within the ten-day appeal period, the program's decision becomes final and is not subject to appeal.

An appeal of exclusion by the program is reviewed by the Dean of The Graduate School (or his designate) who may request additional information from, or a meeting with, the student and/or program before making a final decision. The Dean's decision will be made within 30 days of the submission and will be communicated in writing to both the student and the program. If a resolution cannot be achieved within 30 days, the student and program will be informed in writing of the delay and the final disposition will be achieved as quickly as possible.

The Dean's decision is final in both program and Graduate School exclusion proceedings related to academic progress.

m. Financial Support

Applied Physics students are fully supported with a monthly stipend, health insurance, and a full tuition scholarship. The stipend rate, which is set by TGS, is $45,000/yr for FY 2024–25.

By the end of the first year, students will have selected their thesis advisors and will have begun their PhD research. It is typical for students to be supported as a Research Assistant with their thesis advisor until their thesis is completed.

Students are eligible to apply for any appropriate scholarships or fellowships available through both the McCormick school of Engineering and the Weinberg College of Arts and Sciences.

n. Conflict Resolution

If a student has a conflict with an advisor or faculty member, they should contact the Director of Graduate Studies in Applied Physics. If the conflict is with the Director of Graduate Studies, then they should contact the Co-Directors of Applied Physics. If the conflict is with the Co-Directors, then they should contact Gayle Woloschak, Associate Dean for Graduate Student and Postdoctoral Programs in The Graduate School.

If a student has a conflict with another student, they should first contact their academic/research advisor, and next the Director of Graduate Studies, if necessary. If a resolution cannot be achieved at the program level, then they should contact The Office of Community Standards: https://www.northwestern.edu/communitystandards/index.html .

If a student is experiencing or witnesses sexual harassment, they should contact the University Office of Civil Rights and Title IX Compliance: https://www.northwestern.edu/sexual-misconduct/index.html .

If a student needs to report discrimination, they should contact Respect NU: https://www.northwestern.edu/inclusion/respectnu/incident-report.html

VII. GENERAL INFORMATION

a. Stipend Checks

All recipients of Research Assistantships or Fellowships must complete Employment Eligibility (I9) forms, the Federal W-4 and IL W-4 forms for the University. International students must also complete the Alien Tax Status and other forms required by the Federal government. These forms are now on the web and the Human Resource Department will assist you (https://www.northwestern.edu/hr/for-managers/payroll-administration/tgs2020.html).

Per NU policy, all paychecks must be provided via direct deposit and hard copies are not available. To view your check, please use the FASIS Self Service website. **Please note: To avoid financial problems at the beginning of the Fall Quarter, all incoming students should be aware that you will not receive your first check until September 30th.** Graduate students are on a monthly pay cycle, and will receive paychecks on the last working day of each month.

Avoiding late fees: Tuition bills are available online. Fees other than tuition are the responsibility of the student. If payments are late, a registration hold will be placed on your account and you will not be able to register for the next quarter until any balance has been paid.

b. Research Registration

Doctoral candidates should enroll in courses and APP PHYS 590 Research (as appropriate) for the first eight quarters, then TGS 500 for the duration of the program. The timing of the Qualifying Exam has no bearing on appropriate registration.

Note: Summer registration is mandatory for all students on university support or on F1 or J1 visas.

c. Pass/No-Credit Option

Students working toward a PhD in Applied Physics may **not** use courses taken on a P/N basis to satisfy course requirements. Graduate students may, with the approval of their advisor, take courses on a P/N basis *after* satisfying the course requirements of the program.

d. Academic Honesty

Accuracy and originality are essential in all laboratory reports, term papers, exams, theses, etc. associated with academic research. Ideas, data, quotations and information taken from other sources **(*including the work of fellow students and other group members*)** must be appropriately referenced; failure to do so is plagiarism. The following statements help clarify what is meant by "appropriately referenced":

a. All ideas, data, mathematical expressions, and word quotes taken from the works of others should be clearly and directly referenced to the original author. This is best accomplished by listing a reference number after the material with the numbered references appearing at the end of the manuscript. The following format is also acceptable:

> "The equation can be derived following the approach of Jones[33] as follows: ..."

b. Verbatim quotes **must** have quotation marks at the beginning and end and be referenced in the manner described above.

c. Figures must be referenced as described in a. above.

d. Redrawn figures or plots made from other people's table of data can be appropriately labeled: “after Smith[43]”.

e. Each person should receive proper recognition for contributions made.

Special note: group collaboration on homework assignments is at the discretion of the professor in charge of the course. Unless otherwise stated, students are expected to turn in their original work.

In accordance with Graduate School regulations, "All cases of alleged academic dishonesty involving students of The Graduate School are to be referred by members of the faculty to the Dean of The Graduate School" as well as the Associate Dean of Graduate Studies of Weinberg and McCormick. A student found guilty of academic dishonesty may be dismissed immediately from the graduate program.

The following resources discuss ethical standards in the scientific community.

- *On Being a Scientist* by the Governing Board of the National Research Council is available at https://www.nap.edu/catalog/12192/on-being-a-scientist-a-guide-to-responsible-conduct-in#toc .
- Additional information is provided by Northwestern's Office for Research Integrity, see https://research.northwestern.edu/policies-and-guidance/.

Students should be familiar with Responsible Conduct of Research policies and obligations, and how principles of ethical conduct apply in an academic setting (as discussed also in the mandatory seminar series on responsible conduct in research). Students must enroll in GEN_ENG 519 *Responsible Conduct of Research* during the Fall or Winter quarter of the first year. The Graduate Program in Applied Physics expects the highest level of integrity from every member of the program.

e. Work Obligation of Graduate Students

Students are not to hold additional part-time jobs, except where there are exceptional or extenuating circumstances and with the consent of the advisor and the Director. Additional information from TGS can be found here.

Students are expected to work on thesis research an average of no less than twenty hours per week while taking courses, and full time otherwise, for the research project from which the stipend, supplement and/or tuition are paid. Since all financial support is derived from government or industry contracts and grants, it is the students' responsibility to perform their research tasks in a timely manner. It should be noted that most contracts require formal progress reports on the research performed.

Awards won by students based on work done in the program should be discussed with the Applied Physics Graduate Program Assistant so that an account can be set up for proper disbursement of the funds. If the award includes salary support, the project-derived stipend will be adjusted so that total support does not exceed that of the total awards for the current year. However, the support from the research grant or contract cannot be less than the minimum specified for Graduate Research Assistant Tuition Scholarships. Other award money should be used to support the student's educational expenses; e.g., conference travel, books, computer purchases, etc. Accounting assistance is available from the Program Office if spending must be documented.

f. Vacation Policy for Graduate Students

Students receiving financial aid through the University (Research Assistantships, Fellowships, Teaching Assistantships) are entitled to staff holidays. Please note that the breaks between academic quarters, such as at Christmas and Spring Break, are not vacation periods. Paid vacation or excused absences must be arranged in advance with the faculty advisor. A paid vacation of two weeks per year is considered normal for a student making satisfactory progress toward a degree. If approval from the advisor is not obtained before taking any time off, loss of financial support

may result. Students electing not to take vacation are not entitled to any extra compensation.

g. Consumption of Alcoholic Beverages

Consumption of alcoholic beverages in University buildings, except at official departmental functions and recognized events such as post-defense celebrations, is incompatible with sound safety and work-place practices and is therefore unacceptable. **We expect our students to abide by Illinois laws concerning all controlled substances.**

h. Student's File

Student's application materials, approved study programs, grades for completed courses, records of completed examinations, names of committee members, current address, phone numbers, etc are now kept electronically by the program in GSTS and available to be consulted by the student. Educational records cannot be released to any outside agency without the student's written consent. Students applying for credit cards, etc., which require employment and/or salary verification by the program, must inform the program that such a request may be forthcoming. Verification of employment may also be done through NU's Employment Verification Infoline at https://theworknumber.com/ .

i. Change of Address

The program office must be notified of any change of address. Students may change address through the HR website https://www.northwestern.edu/hr/essentials/personal-information/index.html and also in CAESAR (https://caesar.northwestern.edu/). Be sure to change your address in both systems, as they are separate.

The US Citizenship & Immigration Services (USCIS) requires every international student and scholar to report a change of address within 10 days of their move. It is critical for F-1 and J-1 students to update their address in CAESAR immediately upon the relocation. J-1 and H-1 scholars will need to inform the international office as soon as possible. All F-1 students, J-1 students and scholars, and H-1B scholars will also need to complete a change of address form (AR-11) available on the USCIS website, https://www.uscis.gov/ . Failure to do so will be a violation of their F-1 or J-1 status and could result in severe consequences for them and their dependent(s)!

j. International Students

Upon arrival all international students must register immediately with the Office of International Student and Scholar Services (OISS), 630 Dartmouth Place, Evanston, which will act as advisor on all matters concerning employment practice, visa renewals, etc.

k. Seminar Series

The program organizes a bi-monthly lunch seminar series, during which advanced students in the program present their research. Attendance is expected of all graduate students.

l. Safety

Although the University and faculty project advisors strive to maintain a safe working environment, students must continually be vigilant regarding safe laboratory practice and equipment. No

amount of information and training can replace common sense on the part of the experimenter. If you are uncertain about the safety of a procedure, contact your faculty advisor or the Office of Research Safety, phone number 1-5581.

In addition, students must familiarize themselves with the safety procedures and requirements put in place by the department in which they perform their research.

m. Keys

Students working on research projects may be issued keys to project laboratories (from the advisor's home department office) upon approval of the faculty member responsible for that laboratory. **Keys must not be passed on to anyone else**. Students are not to enter the office of a faculty member at any time when the faculty member is not present.

n. Desk and Research Space Assignment

A desk for personal use will be assigned to each graduate student once the permanent advisor has been assigned. The assignment of both desk and research space are handled by your advisor; please see him or her concerning any move you wish to make. No changes should be made without your advisor's authorization. Be sure to inform the program office of any changes in office assignment.

o. Services and Supplies in Tech

Please note that most facilities have usage fees. Students must have the permission of their advisors before charging any time on equipment or obtaining supplies from any storerooms. **Make sure accounts used are active and proper account codes are open before charging.**

1. **University Instrument Shop (NG40):** Graduate students may find that the machine shop can play an important role in the conduct of their thesis research. The Shop Foreman will be happy to help students with problems relating to machining or participation in the student shop program.

2. **Laboratory Stockroom KG48:** Operated by ThermoFisher, nuevanston.storeroom@thermofisher.com
iBuyNU profile name: Evanston Fisher Stockroom
Contact: Mirjeta Bektes Remaley, 1-8621

p. U-Pass

The Graduate School (TGS) and Chicago Transit Authority (CTA) provide the CTA University Pass (U-Pass) to full-time graduate students through a quarterly TGS Activity Fee. The U-Pass allows unlimited rides on the CTA. More information is available at https://www.tgs.northwestern.edu/services-support/transportation/ .

q. International Travel

Graduate students traveling internationally under university sponsorship or support must abide by two health and safety requirements: (1) Travel must be disclosed to the university's Office of Global Safety and Security (OGSS) prior to departure; and 2) the traveler must enroll in Northwestern's international medical insurance and assistance plan. Additional steps apply if visiting a country with an overall U.S. Department of State (DOS) Travel Advisory Level 3 or Level 4, or a Centers for Disease Control and Prevention (CDC) Warning Level 3. See the OGSS graduate student travel policies page for more information: https://www.northwestern.edu/global-safety-security/travel-policies/graduate-students/index.html .

r. Collective Bargaining Agreement

The first collective bargaining agreement ("CBA") between Northwestern and the graduate student union (NUGW-UE Local 1122) was ratified on March 15, 2024. The CBA applies to graduate students currently enrolled in degree programs when they are providing instructional or research services for the University. Students should refer to the University's graduate student union website for contract details. To the extent that terms in this handbook conflict with the terms set forth in the CBA between the University and NUGW-UE Local 1122, the terms of the CBA will govern.