Department of
Engineering Physics
UNIVERSITY OF WISCONSIN–MADISON

Academic Policies and Procedures for Graduate Work in Nuclear Engineering and Engineering Physics

Effective Fall 2020

This guide applies to students entering the program for the Fall 2020 Session and for subsequent sessions until superseded by a revised guide. Students admitted prior to this time should continue to follow the guide that was in effect when they entered the program. They may petition the Department to select features of the new curriculum.

Administered by the
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Introduction

This handbook details the academic policies and procedures for students working toward the MS and PhD degrees in Nuclear Engineering and Engineering Physics. The graduate program in Nuclear Engineering and Engineering Physics is administered by the Department of Engineering Physics. The time schedules refer to those for full-time students.

Students should become familiar with the pertinent material in this handbook and with the policies and requirements of the Graduate School, (https://grad.wisc.edu/academic-policies/). It is the student's responsibility to make sure that all requirements are met and that all policies are followed.

We welcome you to the University of Wisconsin-Madison and to the Department, and we wish you a successful graduate career!

Admission

For admission to graduate study in Nuclear Engineering and Engineering Physics, an applicant must have a bachelor's degree in engineering, mathematics, or physical science, and an undergraduate record that indicates an ability to successfully pursue graduate study. The Graduate School requires a minimum undergraduate grade point average of 3.0 on a 4.0 basis on the equivalent of the last 60 semester hours from the most recent bachelor's degree. In special cases, students with grade point averages lower than 3.0 who meet all the general requirements of the Graduate School may be considered for admission on probation. GRE scores are required for all applicants who are not UW-Madison graduates. TOEFL/IELTS scores are required for international applicants.

It is highly recommended that students take courses that cover the same material as these UW-Madison courses before entering the program:

Course and Semester Credits	**Typical Courses**
Differential equations, 3 cr	Math 319 or 320
Advanced mathematics, 3 cr	Math 321
Nuclear physics, 3 cr	NEEP305
Materials science, metallurgy, or	
solid-state physics, 3 cr	MSE 350 or 351
Heat transfer or fluid mechanics, 3 cr	CBE 320
Mechanics, 3 cr	Physics 311 or EMA 202

Descriptions of course content can be accessed through the University's course search and enrollment application (https://public.enroll.wisc.edu/search).

Students may enter without having taken these courses. However, in such cases the students must inform their advisors, who will help them plan courses of study that will provide adequate background for our department's graduate curriculum.

Provisions for admission on probation, or as an applicant for more than one master's degree (e.g., simultaneous MS degrees in two departments) are given in the Graduate School website: http://grad.wisc.edu .

Admission as a Special Student

The Graduate School will permit admission as a Special Student for students whose academic record is difficult to evaluate, but otherwise show promise for graduate study. While graduate level work done as a Special Student does not earn Graduate School credit, it may still fulfill departmental course requirements. It can also be used to meet admission requirements and to correct weaknesses in the student's preparation for graduate study. After a satisfactory record as a Special Student, the student can then apply for admission as a graduate student. The student is advised to consult the Graduate School guidelines to determine the current policies and regulations.

Advising

Upon entering the program, each student will be appointed a faculty advisor (also referred to as "major professor") by the chair of the Graduate Studies Committee (GSC). If the student is supported by a research assistantship, this will normally be the professor in charge of the research program. In other cases, the advisor will be a faculty member with expertise in the student's area of interest. Students desiring to change their faculty advisor should coordinate with the current advisor and the new advisor; see additional information in Change of Research Advisor. Students may have a research advisor outside the department if it is appropriate for a student's research area and if the professor is willing to serve in that capacity. In this case, the chair of the GSC also appoints a member of the Engineering Physics faculty to serve as the student's academic (non-research) advisor.

Wait Listed Courses: In any given semester, courses may fill up quickly depending on demand. Some courses may have a wait list established through the enrollment system. Students will be notified by e-mail if they have been given permission to enroll from the wait list. The Department will assist students in enrolling for the courses they need. However, there is no guarantee that students will be allowed into a wait-listed section.

Limits on Credits per Term

Full-time student status requires a student to enroll for a minimum of 8 credits numbered 300 and above, including research credits, each semester until the student becomes a PhD dissertator. The normal maximum number of credits is 15. Dissertators must enroll for three credits during fall and spring semesters. (See https://grad.wisc.edu/documents/dissertator-status/)

Holders of research assistantships, teaching assistantships, traineeships, or fellowships are required to maintain full-time status each semester. Research assistants are expected to register for at least two credits (3 credits for dissertators) during the summer session. Teaching assistants with summer appointments need not normally be registered during the summer. Fellowship holders should consult the terms for their fellowships. A full-time student is limited to 12 credits during the summer.

Grade Policy

The Graduate School requires an average record of B or better in all 300-level or above courses taken as a graduate student, regardless of whether a course counts for credit in the program. The Graduate School reviews each student's progress every semester and will usually refuse continued enrollment after two semesters of below B-average grades unless unusual or extenuating circumstances have prevailed.

The Nuclear Engineering and Engineering Physics program requires that courses in which grades of BC, C, or below are received cannot be counted toward a graduate degree except as follows:

1. Credits of C will be allowed provided they are balanced by twice as many credits of A or by four times as many credits of AB.
2. Credits of BC will be allowed provided they are balanced by twice as many credits of AB or by an equal number of credits of A.

Also, all courses counting toward degree requirements must be taken for credit (not audit), and satisfactory/unsatisfactory grades are acceptable only for courses offered strictly on a S/U basis.

Important Advice: Because of the grade requirements, foreign students coming from an entirely different university system and all students with inadequate preparation are advised to enroll as Special Students for at least their first semester. (See Admission to Graduate Study.)

Graduate Student Seminar

Regular attendance of the Engineering Physics Colloquium (typically held on Tuesdays during the academic year) is a professional expectation of our graduate students.

All Nuclear Engineering and Engineering Physics graduate students are also expected to attend at least one additional research seminar or research group meeting where they may present their own research in a seminar format. First year graduate students are exempt from giving a presentation (although they may volunteer to give one), but all non-first-year graduate students are expected to present on an annual basis.

The goals of the presentation requirement include:

- Provide professional development opportunities for graduate students.
- Improve the oral presentation skills of graduate students.
- Improve the ability of graduate students to "think on their feet."
- Provide an opportunity for graduate students to further understand and explain the context of their research.
- Provide a forum in which conference presentations can be practiced in front of a large technical audience.
- Improve information exchange between research groups.
- Enhance the sense of community among students in the graduate programs within the Department of Engineering Physics.

Master of Science Degree

Requirements for the Master of Science in Nuclear Engineering and Engineering Physics

1. The following courses or courses with similar material content must be taken either prior to or during the course of study for the M.S. degree:
   a. Nuclear Instrumentations Laboratory, NE 427
   b. Nuclear Reactor Laboratory NE 428 or Laboratory Course in Plasmas NE 526
   c. Ionizing Radiation NE 408 or Health Physics and Biological Effects NE 569

   Students who have taken courses with similar material content at another institution, must contact the chair of the Graduate Studies Committee for approval of the specific course(s).
2. The candidate must complete, during the course of graduate study, 30 credits of technical courses approved by his or her advisor. These courses must be consistent with the following requirements:
   a. Students must take at least 15 credits designated as "Grad 50%" from NE, Math, Physics, Chemistry, Computer Science, or any other engineering department, except EPD. "Grad 50%" courses are designated as such in the UW-Madison Guide, http://guide.wisc.edu/. They include 790 thesis credits.
   b. If the student completes a Master's thesis, then
      i. At least 8 credits of NE courses at the 400 level or above are required. Cooperative Education, Thesis, and Seminar credits cannot be used to satisfy this requirement.
      ii. A maximum of 12 credits may be granted for the thesis
      iii. The remaining credits (also numbered 400 or higher) must be in appropriate technical areas such as physical sciences, radiology, or suitable biological studies, but not humanities or social studies.
      iv. At least 9 credits must be numbered 500 or higher. Cooperative Education, Thesis, and Seminar credits cannot be used to satisfy this requirement.
      v. Up to 3 credits can be seminar credits.
   c. If the student does not complete a Master's thesis, then
      i. At least 15 credits of NE courses at the 400 level or above are required. Cooperative Education, Thesis, and Seminar credits cannot be used to satisfy this requirement.
      ii. The remaining 15 credits (also numbered 400 or higher) must be in appropriate technical areas such as physical sciences, radiology, or suitable biological studies, but not humanities or social studies.
      iii. At least 12 credits must be numbered 500 or higher.
      iv. Up to 3 credits can be seminar credits. No more than one seminar credit can be taken in any given semester.
      v. The student must complete an oral exam covering the courses taken as a graduate student. This exam is to be arranged with the student's advisor prior to graduation.
3. The courses taken as a graduate student must satisfy the departmental grade policy.

4. Only one course (maximum of 3 credits) of independent study is allowed (699, 999).
5. The candidate must satisfy all Graduate School requirements, including grade point average requirements.

Satisfying Requirements with Previous Coursework

With permission from their faculty advisor and the Graduate Studies Committee Chair, students may use up to 6 credits of course work taken as part of a graduate program at another institution if they meet departmental MS requirements. Students with a BS degree in engineering at UW-Madison may use up to 7 credits of their undergraduate work towards their MS degree. With permission from their faculty advisor and the Graduate Studies Committee Chair, students with a BS degree from an ABET accredited engineering discipline at another institution may use up to 7 credits of undergraduate work toward their MS degree.

In all situations, the Graduate School stipulates that only coursework earned within five years of acceptance to a UW-Madison master's program may be considered.

Research and Thesis Credits

NE 790 is for research that is expected to lead to a MS thesis, NE 890 is for PhD research where the student has not yet become a dissertator and the research will not be used for a MS thesis, and NE 990 is for PhD dissertation research, where the student is a dissertator. Credits taken per semester are variable. Students should discuss the appropriate number of credits for a specific semester with their advisors.

Master's Thesis

1. A Master's thesis is not required. It is usually recommended for students intending to finish their graduate study with a Master's degree and who are interested in research. Students should consult their advisors regarding the thesis and coursework-only degree options.
2. A maximum of 12 credits may be granted for a master's thesis. Credit for Master's research (NE 790) will be granted toward meeting the MS requirements only when a formal MS thesis is submitted.
3. The Department requires that the MS thesis be submitted to the Memorial Library. It is suggested that students consult Memorial Library rules and regulations early as plans are made for thesis completion. See the Graduate School's information https://grad.wisc.edu/current-students/masters-guide/ and note the requirement for an advisor approval page; the form that appears in Appendix C may be used.

Master's Oral Examination

Candidates must pass an oral exam administered by a three-member committee, selected by the student's advisor. Students who have passed the oral part of the PhD Qualifying Exam will be deemed to have passed the Master's oral exam, unless they have written a MS thesis. The use of thesis credits (NE 790) as part of the 30-credit MS requirement always requires an oral defense, and in these cases, two of the committee members must be members of UW-Madison Graduate Faculty. Students completing a coursework-only MS must have three members of the UW-Madison Graduate Faculty on their committees. For more information, see https://grad.wisc.edu/documents/committees/.

The oral exam will be on the thesis if the student submits one; otherwise, it will be on coursework taken by the student. The student will have two chances to pass the oral exam, with at least one month between the two exams. Students should contact their advisor with respect to the timing of the exam and the composition of the committee.

Criteria for Satisfactory Progress

Students with a Bachelor of Science in Nuclear Engineering or equivalent are typically expected to complete the Master of Science in 3 semesters. Students with non-NE backgrounds will typically be permitted 4 semesters to complete their master's if more than 27 credits are required.

Application Procedures for the Master's Degree

The following is a summary of some of the Graduate School requirements. This is not a complete list. Please review the Graduate Guide (https://guide.wisc.edu/graduate/) *and the Graduate School Academic Policies and Procedures for a complete list or contact the Graduate School.*

You need to be enrolled for a minimum of two graduate-level credits (300 or above) for a grade (audits and pass/fail do not satisfy this requirement) during the semester in which you intend to graduate. For more information and for deadlines see *Completing Your Master's Degree,* found at the website https://grad.wisc.edu/current-students/masters-guide/ .

To receive your master's degree, contact the Graduate Student Services Office, 3182 Mechanical Engineering, at the beginning of the semester in which you intend to graduate. Have your faculty advisor check that you have met Department requirements, then Student Services will check that you have met the Graduate School's requirements. Submit a warrant request form (available from https://www.engr.wisc.edu/department/engineering-physics/academics/ms-nuclear-engineering/) at least three weeks prior to your defense/exam date, and Student Services will then request a warrant on your behalf from the Graduate School.

If you have a prior master's degree from this University, you must submit, along with your degree application, a letter from each department that includes an official (signed by advisor or Graduate Studies Committee Chair) list of courses used for each degree. Your warrant application is not complete until the two lists are received.

You must have a graduate GPA of at least 3.0/4.0 and no incomplete or progress grades on your record.

A signed warrant is a document needed to graduate. The warrant is issued by the Graduate School for one semester only. The warrant is signed by your academic advisor and the Department Chair, indicating that all degree requirements have been met. Warrants can only be issued after all incomplete and progress grades are cleared.

If the Department has signed and returned your warrant to the Graduate School, and you subsequently receive an incomplete or progress grade, you will graduate during the semester in which your grade is cleared.

Doctor of Philosophy Degree

Credit Requirements

Students must take a minimum of 51 credits (consisting of coursework and 890/990 credits) with at least 26 credits being graduate level (as defined in the MS requirements).

The candidate must take at least 9 credits of technical coursework at the graduate level beyond the courses required to fulfill the MS degree (30 + 9 = 39 credits). If a student completes a MS thesis, the minimum number of technical credits of coursework required is 39 credits minus the number assigned to the MS thesis (max. 12 credits).

Coursework Requirements

1. All students must fulfill the coursework requirements for the MS degree whether receiving the MS degree or going directly to the PhD. Students should consult with their advisors as to whether coursework taken elsewhere will fulfill some or all of the requirements.
2. The candidate is required to complete one course in each of the following areas:
   - Fission Reactors (e.g., NE 405, 408, 411, 506, 520, 550, 555, 565, 574)
   - Plasma Physics & Fusion (e.g., NE 525, 527, 528, 536)
   - Materials (e.g., NE 423, 541, EP 562, Physics 551)
   - Engineering Mathematics & Computation (e.g., EP 547, 548; CS 513, 514, 713; Math 703)

   The courses listed in parentheses are examples of courses that will meet this requirement and are not meant to be a restricted list of possible courses. These courses must be taken as a graduate student and be at the 400 level or above. If a student has taken one or more of the courses in some area as an undergraduate student, he or she would need to take another course in the same area. Students possessing substantial background in any of the four areas may request to be excused from the requirement to take a course in that area either by petition to the Graduate Studies Committee Chair or in the student's Doctoral Plan.
3. The candidate must take three 700 level courses. Doctoral students may take additional advanced courses as appropriate to their particular field of specialization.
4. The candidate must satisfy the PhD Technical Minor requirement.
5. The candidate must satisfy the PhD Non-Technical Minor requirement.

Satisfying Requirements with Previous Coursework

All credits earned toward the Nuclear Engineering and Engineering Physics MS degree at UW-Madison apply toward the NEEP PhD, provided that they satisfy the Graduate School's time constraint. The following applies to other situations where an MS degree has been earned.

With advisor and EP Graduate Studies Committee approval, students may use up to 15 credits of prior MS coursework toward the PhD, provided that all of the following are met.

1. The student has completed an MS degree in a relevant field.
2. The coursework proposed by the student is at the graduate level and was taken as part of the student’s completed MS program.

3. The student's faculty advisor agrees that the prior coursework proposed by the student satisfies the NEEP PhD program requirements in terms of subject area and rigor.
4. A member of the EP Graduate Studies Committee who is familiar with the NEEP PhD program confirms the advisor's recommendation.

Students who have not completed an MS in a relevant field are eligible to apply for credit for other previous coursework, according to the policies outlined in Satisfying Requirements with Previous Coursework in the Master of Science Degree section of this handbook.

In all situations, the Graduate School stipulates that only coursework earned within ten years of acceptance to a UW-Madison PhD program may be considered.

Minor Field of Study

The minor field of study must be distinct from the student's major area. It should be chosen in consultation with the major professor, and it must be approved by the chair of the Engineering Physics Graduate Studies Committee. The *PhD Minor Agreement Form* must be on file with the Department of Engineering Physics halfway through the minor program. Forms are available from the department website, https://www.engr.wisc.edu/department/engineering-physics/academics/ms-nuclear-engineering/ .

There are two minor options available:

Minor Option A: Students minor in a single department and satisfy the minor requirements of that department.

Minor Option B (Distributed Minor): This option requires a minimum of 9 credits, total, from two or more departments outside the major in courses selected for their relevance to a particular area of concentration. No course below the 400 level may be used to satisfy this requirement.

Non-Technical Minor

PhD. candidates must complete one of the following four study options prior to receiving dissertator status. As this is a formal Department requirement, the student should select a Non-Technical Minor early in the program and then complete it to achieve dissertator status (see below). The Non-Technical Minor must be planned with the help of the candidate's advisor and must be approved by the Department Non-Technical Minor Advisor except for Study Option IV which must be approved by the Department faculty. A *Non-Technical Minor Approval Form* is also available from the department website (see link for technical minor), and must be filed prior to submission of the doctoral plan form. Courses below the 400 level may be used as a part of the Non-Technical Minor.

Study Option I: Technology-Society Interaction Coursework. This option is intended to increase the student's awareness of the possible effects of technology on society and of the professional responsibilities of engineers and scientists in understanding such side effects. These effects could, for example, involve the influence of engineering on advancement of human welfare, on the distribution of wealth in society, or on environmental and ecological systems.

Suggested courses for fulfilling **Option I** include the following:

- CEE 320 Environmental Engineering
- CEE 423 Air Pollution--Effects, Measurements and Control
- Econ/AAE 474 Economic Problems of Developing Areas

- Geog/URB R PL 305 Introduction to the City
- Geog/URB R PL 505 Urban Spatial Patterns & Theories
- Hist Sci/Med Hist/Relig St 331 Science, Medicine and Religion

Study Option II: Humanistic Society Studies Coursework. The basic objectives of this option are to help prepare the student to bridge the gap between C.P. Snow's "Two Cultures." Snow's 1959 lecture thesis was that the breakdown of communication between the "two cultures" of modern society - the sciences and the humanities - was a major hindrance to solving the world's problems. Study might be designed to give a greater appreciation of the arts such as the classics, music, or painting, or it might be designed, for example, as preparation for translating technical information to the non-technical public.

Suggested areas of study to fulfill Option II include Anthropology, Area Studies, Art, Art History, Classics, Comparative Literature, Contemporary Trends, English (literature), Foreign Languages (literature), Social Work, Sociology, and Speech.

Under either Option I or II, the student must take 6 credits of coursework. The courses must be approved by the student's advisor and the non-technical minor advisor, and the 6 credits should be concentrated in one topical area. Grades in these courses need not meet the Departmental Grade Policy. However, note that all grades in 300 level or above courses (including grades for Non-Technical Minor courses) are calculated in the Graduate School minimum 3.0 graduation requirement.

Study Option III: Foreign Culture Coursework. This option is intended for the student who desires to live and work in a foreign nation or work with people of a foreign culture. Examples include studies of the history of a foreign nation, of the political stability of a region of the world, of the culture of a particular group within a nation, or of the spoken language of a foreign nation.

For Option III the student must take six credits of courses under all of the same conditions and requirements as for Option I and II unless choosing language study. For the latter case, the student must attain a grade of C or better in all courses. If the student has previous knowledge of a language, it is required that either courses beyond the introductory level will be selected or that another language will be selected.

Study Option IV: Technology-Society Interactions Experience. There are many possible technology- society interactions that might be more educational and meaningful for the student as an actual experience than coursework. For example, the student might run for and be elected to a position of alderperson in the city government. Consequently, this option allows the student to pursue a particular aspect of the interaction using his own time and resources.

Study Option IV activity must be planned with the student's advisor and be approved by the faculty. The effort required should be equivalent to 6 credits of coursework. Upon completion of this program, the student will prepare a written or oral report.

Note: Foreign students from countries in which English is not the native language have inherently fulfilled these non-technical study goals and are exempt from these formal requirements.

PhD Qualifying Examination

Qualifying Exam Scheduling: The examination is given each fall and spring semester within the first week of classes. All eligible students will receive notice each time the exam is given. It is the

student's responsibility to consult with his or her advisor for approval to take the exam at that time and the specific exams to be taken.

The exam must be first taken no later than completion of the MS requirements, or the beginning of the fifth semester of graduate study, whichever comes first. Students entering the program with a master's degree in EM or NEEP from another institution, and taking the qualifying exam in that same major, should take the exam by the beginning of their third semester.

Requirements for Passing the Qualifying Exam: Students are given two chances to pass the set of qualifying exams. All exams are to be graded on a pass/fail basis. If an individual exam is failed, it must be retaken the next time that qualifying exams are scheduled. An exam that is passed does not have to be repeated, independent of student performance on the other exams.

Subject Area Options for the Qualifying Exam: The student with their advisor's approval will sign up to take 3 three-hour closed book written exams from a possible list of 7 exams plus an oral exam.

These 7 written exams are planned to be in the following topic areas (resources are detailed below):

- Mathematics (Math 319, 321 and 340 or similar topics in EMA/EP 547)
- Classical Physics (Physics 311 and 322)
- Modern Physics (Physics 241 and NE 305)
- Mechanics and Materials (EMA 303, 506 and MS&E 350)
- Dynamics and Vibrations (EMA 202, 542, 545)
- Momentum and Heat Transfer (ChE 320 or similar topics in ME 363, 364)
- Reactor Analysis and Radiation Protection (NE 405, 408, 427)

Exceptions to the Qualifying Exam Policy: In a few cases it may be unreasonable to retake the exam the next time it is given; in this case the student should petition the Department for permission to defer the reexamination. Such a petition should be by letter and must be received by the Chair of the Qualifying Exam Committee within one month after learning the outcome of the first examination. If extenuating circumstances should arise thereafter and before the next exam, the student can petition the Department for a deferral.

On rare occasion, extenuating circumstances, such as a medical condition, may arise that affects a student's ability to pass the qualifying examination in two attempts. If a student fails the qualifying examination twice, and after reviewing the graded second exam and consultation with his or her advisor, the student feels that extenuating circumstance hindered his or her performance, he or she can petition the Department for a third attempt. Such a petition should be by letter and must be received by the Chair of the Qualifying Exam Committee within one month after learning the outcome of the second examination. The Department faculty will review the petition and decide whether the student will be granted a third opportunity to pass the exam.

Description of the Oral Qualifying Exam: An oral exam is required for all students taking the qualifying exam and will be graded on a pass/fail basis. The oral exams are scheduled immediately after the written exams. The subject matter of the questions is based on the written exams chosen by the student and his or her advisor, e.g. Mathematics, Modern Physics, and Reactor Analysis and Radiation Protection. The oral exam committee consists of 3 faculty members including the student's advisor, one additional member from the student's same research area, and one member from a different research area. The oral exam lasts approximately one hour.

Description of the Written Qualifying Exams: Listed below are topics, courses and texts representative of material to be covered on the respective examinations. Prior exams (without solutions) are available in the Department office.

A. Engineering Mathematics (3 hours, typically 4 out of 6 questions):
Ordinary Differential Equations (Math 319)
Boyce & DiPrima, *Elementary Differential Equations & Boundary Value Problems*
Applied Mathematical Analysis (Math 321)
Greenberg, *Advanced Engineering Mathematics* Hildebrand, *Advanced Calculus for Applications*
Linear Algebra (Math 340)
Lay, *Linear Algebra and Its Applications*

B. Classical Physics (3 hours, typically 4 out of 6 questions):
Mechanics (Physics 311)
Marion and Thornton, *Classical Dynamics of Particles & Systems*
Intermediate Electricity and Magnetism (Physics 322)
Griffiths, *Introduction to Electrodynamics*
Lorrain & Corson, *Electromagnetic Fields and Waves*

C. Modern Physics (3 hours, typically 4 out of 6 questions):
Fundamentals of Modern Physics (Physics 241)
Tipler, *Elementary Modern Physics*
Atomic and Nuclear Physics (NE 305)
Krane, *Introductory Nuclear Physics*

D. Mechanics and Materials (3 hours, typically 4 out of 6 questions):
Mechanics of Materials (EMA 303)
Gere, *Mechanics of Materials*
Advanced Mechanics of Materials (EMA 506)
Cook & Young, *Advanced Mechanics of Materials*
Fundamentals of Materials Science (MSAE 350 or 351)
Van Vlack, *Elements of Materials Science and Engineering*
Callister, *Materials Science and Engineering, An Introduction*

E. Dynamics and Vibrations (3 hours, typically 4 out of 6 questions):
Elementary Dynamics (EMA 202)
Gray, Costanzo, Plesha, *Engineering Mechanics – Dynamics*
Advanced Dynamics (EMA 542)
Ginsberg, *Advanced Engineering Dynamics*
Mechanical Vibrations (EMA 545)
Thomson, *Theory of Vibrations with Applications*
Ginsberg, *Mechanical and Structural Vibration*

F. Momentum and Heat Transfer (3 hours, typically 4 out of 6 questions):
Transport Phenomena (CBE 320)
Bird, Stewart and Lightfoot, *Transport Phenomena*; or
Elementary Fluid Dynamics (ME 363)
Fox & McDonald, *Introduction to Fluid Mechanics*
Heat Transfer (ME 364)
Incropera & DeWitt, *Fundamentals of Heat Transfer*

G. Reactor Analysis and Radiation Protection (3 hours, typically 4 out of 6 questions):
Nuclear Reactor Theory (NE 405)
Duderstadt and Hamilton, *Nuclear Reactor Analysis*
Ionizing Radiation (NE 408)
Lamarsh, *Introduction to Nuclear Engineering*
Nuclear Instrumentation (NE 427)
Knoll, *Radiation Detection and Measurement*

Accommodations for Students with Disabilities: The PhD qualifying exam policy for students with disabilities follows the accommodations made for coursework. See the full statement on coursework accommodations that appears earlier in this handbook.

Doctoral Plan of Study

The Department will formally accept the student as a candidate for the PhD after the passage of the qualifying examination and upon approval of a doctoral plan of study showing the intended courses of study. The format to be used for this application is given in Appendix B. The Departmental faculty will review the student's entire academic history. It will act on the application based on its collective knowledge of the student's performance in and out of formal coursework. Factors which will be considered include: (a) whether the student would likely profit from further, formal academic study, and (b) whether the student meets the high academic standards and the standards of intellectual integrity expected of a PhD holder from the University of Wisconsin-Madison. This is a decision of the Department as a whole, and while the advice of the student's major professor is solicited, the major professor does not make the decision alone. The student is expected to discuss the doctoral plan in detail with and receive approval of their major professor in order to develop a coherent academic plan of doctoral study.

Approval of the student's proposed course of study will automatically indicate acceptance by the Department as a PhD candidate, and the student will be advised in writing. Attention is called to the fact that formal acceptance as a candidate, rather than passage of the qualifying examination, ordinarily constitutes the major step in progress towards the PhD.

Note: To ensure that a coherent program is planned, the student must submit the doctoral plan of study one month before the end of the semester following the one in which the qualifying exam is passed.

If a distributed technical minor is proposed, acceptance as a PhD candidate constitutes Departmental approval of that technical minor.

If it becomes necessary to modify the student's proposed course of study after it has been approved, it is the student's responsibility to bring the matter to the attention of the faculty in writing.

Note: The Graduate School considers an applicant formally admitted to candidacy for the PhD degree when the student has:

(a) Passed the comprehensive preliminary examination in the major field,

(b) Obtained approval of the proposed technical minor requirement, and

(c) Presented the title or special field of the proposed thesis, approved by the major professor.

PhD Preliminary Examination

After acceptance of the student's doctoral plan of study, the student must take an oral preliminary examination. Students are expected to pass the PhD preliminary examination no later than the end of the third year of graduate studies, or by the end of the second regular semester following the one in which the PhD qualifying examination was passed, whichever is later. They are required to take the preliminary examination within four years of passing the PhD qualifying examination.

In preparation for this examination, the student shall submit a written thesis proposal containing a discussion of the thesis problem, a survey of pertinent literature, an evaluation of the importance of the problem, an outline of the proposed method of solving the problem, drawings of any equipment to be constructed, a cost estimate, and any preliminary results obtained. The student will then defend the thesis proposal in an oral preliminary examination. The examination committee will normally be the same as selected for the final oral examination (see below). It will include members from at least two UW-Madison Graduate School degree programs (see https://grad.wisc.edu/academic-programs/), including the student's major degree program, and the chair or co-chair must be a member of the student's major program. The committee membership will be selected in order to make a critical evaluation of the proposed thesis.

Warrant: The candidate must apply for a warrant from the Graduate School through the Graduate Student Services Office, 3182 Mechanical Engineering, at least three weeks prior to the exam. The form is available from https://www.engr.wisc.edu/department/engineering-physics/academics/ms-nuclear-engineering/ .

Should the candidate not pass the preliminary examination, the student is granted a second opportunity to be held within six months of the first examination

Dissertator Status

All PhD candidates who passed their preliminary examination and have completed the major as well as the minor requirements can be designated dissertators. Dissertators register for exactly three credits. (See https://grad.wisc.edu/documents/dissertator-status/.) Dissertators normally enroll in thesis and research courses (NEEP990), but with the approval of their advisors are permitted to substitute three credits of any other graduate level courses.

Continuous Enrollment: Dissertators should register each semester until the PhD thesis is filed. If the student fails to do so, a PhD Dissertation and Degree Completion Fee equal to 12 times the current dissertator per-credit rate is required.

Final Oral Examination

An oral examination on the findings of the PhD research is required at the end of the thesis work. This thesis defense is made before a committee of at least five members, who have had access to a copy of the thesis for at least 10 days prior to the oral examination. It is advisable to choose this committee as close to that of the preliminary examination committee as practical. At least 4 of the committee members must be members of the UW-Madison Graduate Faculty. The committee must include members from at least two of the UW-Madison Graduate School degree programs. The chair or co-chair must be a member of the student's major degree program, and at least 3 of the committee members must be members of the Engineering Physics faculty. One of the members of the committee may be from outside the UW-Madison, subject to approval by the

Engineering Physics Faculty. (Departmental requirements exceed the Graduate School minimum requirements at https://grad.wisc.edu/documents/committees/ .)

Warrant: The candidate must apply for a warrant from the Graduate School through the Graduate Student Services Office, 3182 Mechanical Engineering, at least three weeks prior to the exam. The form is available from https://www.engr.wisc.edu/department/engineering-physics/academics/ms-nuclear-engineering/ .

This examination shall be publicly announced at least one week prior to the examination date. Faculty and students are invited to attend, and guests are also welcome to attend the open session of the exam.

Thesis

The thesis must be the candidate's own work; it reports on the original research carried out by the student for the PhD degree. It may be the result of research enterprises in which others have collaborated, but in such cases the candidate is required to present a substantial portion which represents the candidate's own contribution.

The total cost and preparation of the thesis is the responsibility of the student. Detailed instructions for thesis preparation are available from the Graduate School Office in Bascom Hall, and on the Graduate School webpage: https://grad.wisc.edu/current-students/doctoral-guide/ .

Library Copy: The submitted thesis must meet the specifications of the Graduate School. See the above link for detailed information.

Department and Major Professor Copies: You should provide copies of the thesis to the department and your advisor and they should be bound in durable black Buckram binding with hard cover (Grimm's book binding can do this or check with the library for this service.) The student's name, degree and year of graduation should be printed in bold gold letters on the book spine. The front and back covers should remain blank.

Industrial/Research Sponsor Copy: The major professor will determine if additional copies are needed. He/she will also advise the student as to the specifications of the copy.

Criteria for Satisfactory Progress

It is important that graduate students make satisfactory progress in their program of study. One measurement of the student's progress is his or her schedule for completing various requirements for the PhD degree. The relevant deadlines are listed below. Students not meeting these deadlines are considered to not be making satisfactory progress and may become ineligible for financial support and/or may be dropped from the program.

1. The qualifying examination must be first taken no later than completion of the MS requirements, or the beginning of the fifth semester of graduate study, whichever comes first. Students entering the program with a master's degree in EM, EP or NEEP, and taking the qualifying exam in that same major, must take the exam by the beginning of their third semester.
2. The Graduate School PhD Minor Agreement Form must be on file with the Department of Engineering Physics halfway through the minor program.
3. Students are expected to submit the Doctoral Plan of Study one month before the end of the semester following the one in which the qualifying exam is passed.

4. Students are expected to schedule and pass the PhD preliminary examination no later than the end of the third year of graduate studies, or by the end of the second regular semester following the one in which the PhD qualifying examination is passed, whichever is later. A candidate who fails to take their preliminary exam within four years of passing their qualifying exam must retake the qualifying exam unless there are extenuating circumstances (such as medical) and the Department faculty approves a delay. Students in this situation should meet with their advisor and develop a plan for taking the preliminary exam, subject to approval by the Department faculty.
5. A candidate who fails to take the final oral examination and deposit the dissertation in the Memorial Library within 5 years after passing the preliminary examination must take another preliminary examination. See the Graduate School's policies on preliminary examinations and time limits for additional information.

Satisfactory Progress in Research: Progress in research is evaluated by a graduate student's faculty advisor/major professor and is officially recorded in grading for research credits. The Engineering Physics Department's procedures for unsatisfactory progress are as follows:

1. Upon first occurrence of a grade of U (unsatisfactory) in any of 790 (MS thesis), 890 (pre-dissertator), and 990 (dissertator) research, the faculty advisor will notify the Department's Graduate Performance Review Committee (GPRC) and submit a copy of each annual performance record for that student to the GPRC. The GPRC will then meet with the faculty advisor to discuss the student's research performance and what steps are planned to help the student achieve a satisfactory level of progress in research. The faculty advisor will then meet with the student to communicate the plan with the student.
2. Upon any subsequent occurrence of a grade of U in 790, 890, or 990 research, the faculty advisor will again notify the GPRC and resubmit annual performance records. The GPRC will meet with the faculty advisor to decide whether to end the student's PhD candidacy. The faculty advisor will inform the student of the GPRC/advisor decision. The GPRC will document its recommendations, including justifications and materials reviewed, and submit the recommendations to the Department Chair. The student will also be provided with the documented recommendations.
3. If the student disagrees with a decision to end PhD candidacy, within 10 days of being notified of the decision, he or she may submit a written petition to the GPRC that clearly describes specific efforts made to improve performance and how continuation of PhD candidacy will lead to a satisfactory research outcome. The GPRC will then decide whether to 1) grant an extended research-probation period under the same faculty advisor, 2) grant a research-probation period under a new faculty advisor, or 3) retain the original decision. The GPRC will notify the Department Chair of its recommendation.
4. If an extension period is granted, the current faculty advisor will conduct a performance review with the student at the end of the period. The advisor will then meet with the GPRC, which will decide to either reinstate the student to non-probationary PhD candidacy or end the student's PhD candidacy. The GPRC will notify the Department Chair of its recommendation.

A PhD student whose candidacy has been ended due to unsatisfactory research progress may remain eligible for an MS degree, but the student loses his or her guarantee of assistantship support.

Minor in Nuclear Engineering and Engineering Physics

For students in other departments seeking a minor in Nuclear Engineering and Engineering Physics, the following requirements apply:

1. A student who has earned an MS degree in Nuclear Engineering and Engineering Physics will be considered to have fulfilled the minor requirements.
2. A minimum of four NE courses, 400 level or above, are required for the minor. These are decided in consultation with the student's advisor.
    a. All courses used for the minor must be 400 level or above and taken after the bachelor's degree.
    b. Ordinarily only one course (maximum of 3 credits) of independent study is allowed (699, 999).
    c. Research and thesis courses may not be used for the minor.
    d. No more than 5 credits completed 5 or more years prior to admission to the Ph.D. major may be used.
    e. Courses taken 10 or more years ago may not be used.
    f. Courses taken pass-fail or for audit may not be used.
    g. Courses with grades of S given in courses graded on a credit/no credit basis are acceptable.
3. A GPA of 3.0 must be maintained for the minor.
4. A maximum of 6 credits may be transferred from other institutions to satisfy the minor requirements.
5. The minor program must be approved by the Minor Program Advisor, appointed by the Department Chair. The approval form is available from the department website, https://www.engr.wisc.edu/department/engineering-physics/academics/ms-nuclear-engineering/ .

Graduate Policy-Related Web Sites

The Graduate School web site (https://grad.wisc.edu) has extensive information concerning policies and procedures for graduate students. Students are responsible for consulting these policies and procedures and for abiding by them.

Other useful web sites are:

Engineering Physics Department	http://www.engr.wisc.edu/department/engineering-physics
College of Engineering	http://www.engr.wisc.edu
Graduate student wellness, see	https://grad.wisc.edu/current-students/

Graduate Student Mentor/Mentee Expectations for Engineering Physics

The primary purpose of having this written set of expectations is to lay the foundation for mutually beneficial professional relationships between graduate students and their faculty mentors. Students rely on their mentors to help them learn the information and skills that will make their careers successful, and mentors rely on students to help perform research and teaching activities.

Expectations stemming from the graduate program

- Time to degree completion:
  - The target average time to complete our PhD programs is five to six years (less for those starting with an MS degree in a relevant program). Students are encouraged to complete their degrees in less time if it does not sacrifice the quality of the work.
  - Students in research-oriented MS programs are expected to complete their degrees in 1 ½ to 2 ½ years. Students in accelerated MS programs are expected to complete their degrees in 1 to 1 ½ years.
- Funding: For PhD students matriculating with an assistantship offer in the Fall 2019 semester or later, there is a period of guaranteed support of 5 years for those entering with a bachelor's degree and 3 years for those entering with an MS degree. However, the student can expect the Department to make every effort to provide some form of support through degree completion, even if a student requires more time than the guaranteed period. In all cases, a student must maintain satisfactory progress toward the PhD degree, according to the NEEP and EM program policies and the Graduate School's policies to continue to receive funding.
- Facilities and other support: For all PhD students, research-oriented MS students, and other graduate students supported by assistantships, the Department and research group will provide work facilities for professional activities, including suitable office spaces, throughout the degree program. Project-specific resources, such as laboratory equipment and computational resources, are the responsibility of the graduate mentor.

Academic staff: The graduate coordinator for your program provides assistance with requirements of the Graduate School, enrollment, and administrative aspects of degree completion. Department staff help with assistantships, payroll, benefits, work-related travel and purchasing, and reimbursements.

Expectations of the graduate advisor

- Faculty advisors will exercise the highest standards when working with all students.
  - They will uphold the University's statement on diversity (diversity.wisc.edu) and treat students fairly and without bias in accordance with Graduate School policies (grad.wisc.edu/academic-policies).

    - They will not display hostile and intimidating behavior (HIB, https://hr.wisc.edu/hib) when interacting with students.
    - They will participate in recurring training for HIB, bias, and professional ethics.
- Advisors will develop a set of specific expectations pertaining to their research groups and their research activities.
- Advisors will hold individual meetings with their graduate mentees.
    - Advisors will meet, regularly, with their graduate students to provide feedback on progress toward research objectives. While group meetings may also help provide feedback, they are not replacements for individual meetings.
    - Advisors will provide timely guidance to their mentees on progress toward degree completion, including course planning, qualifying exams, thesis proposal, thesis committee, thesis preparation and defense.
    - Advisors will provide performance evaluations to each graduate mentee, at least annually. Advisors will record their annual evaluations in the College of Engineering's Graduate Online Assessment and Achievement Learning System and review the evaluation, individually, with each student.
- Advisors will ensure a healthy working environment for their mentees.
    - This includes physical safety and workload expectations that are fair and allow students to balance research and academic requirements with a healthy lifestyle.
    - Advisors will respect Graduate School policy that research assistantships are for performing work that is relevant to the student's course of study with occasional other duties that are not to exceed 5 hrs/week (grad.wisc.edu/documents/research-assistant).
    - Advisors will allow students the equivalent of at least one day off from assistantship duties per week.
    - Advisors will accommodate temporary periods of intense coursework activity, such as exam periods.

Advisors will recognize students for their contributions to a research program. This recognition comes in the form of authorship/co-authorship of journal publications and reports and supporting students to present research findings at professional meetings and conferences.

Expectations of the graduate student

- Although graduate mentors and academic staff provide guidance, students are responsible for their own education and for satisfying degree requirements of the Graduate School and of their graduate program.
- Students are expected to develop, over time, the professionalism that is critical for success in their future careers. Working with high ethical standards is expected throughout the graduate program.
- Students are expected to be able to develop a work schedule that allows for a healthy work-life balance. Nonetheless, the pursuit of research may demand:
    - Occasional periods of intense workload to meet important deadlines--this should not be routine.
    - Long experimental campaigns, possibly requiring overnight supervision--if this is needed on consecutive days, the responsibility will be shared with group members taking shifts.
- Students on assistantships are expected to perform their duties, despite coursework requirements.
    - They should expect that coursework and assistantship duties amount to a full-time professional commitment.
    - They should consult faculty advisors for guidance on course loads that are commensurate with assistantship responsibilities.

    - They should coordinate, in advance, workload adjustments to accommodate temporary periods of intense coursework activity.
    - Students on assistantships need to coordinate absences and vacations with their faculty advisors in advance.
- Thesis MS and PhD students are expected to engage in formal and informal professional development activities, including performing research, documenting research, contributing to team aspects of a research group, interacting with other experts and peers in their discipline, reading relevant publications, and attending and presenting research at meetings and conferences.
- Students are expected to attend individual and group meetings held by their faculty advisor.
- The dissertator period of the PhD program provides students with an opportunity to focus on research and on completing their PhD dissertations. Students are expected to work full-time on research and writing, with a strong work ethic, during this period of the program.

Afterword

A set of expectations would be inconsequential if there were no recourse for not meeting them. When faculty advisors find that students are not meeting expectations, they will provide direct, individual feedback and document the findings in performance evaluations, if needed. Further recourse would follow the Department's policy on Satisfactory Progress in Research that is described in the graduate handbooks.

If students find that their graduate advisor is not meeting expectations, they are encouraged to bring the matter to the attention of the graduate advisor. If they feel uncomfortable doing so or would like another perspective, they should seek advice from one or more members of the Department's Graduate Studies Committee or from the Department Chair. If the gravity of the situation warrants, students should follow the Department and College grievance procedures.

Change of Research Advisor

There are situations where research-MS students or PhD students will change advisors. The not-uncommon situation is a change in research interest on the part of a student, and procedures for that situation are described, first.

Change in student's research interest

In this situation, it is the student's responsibility to ensure that a transition is possible.

- The student needs to discuss the desire to change topics with the current research advisor. In some cases, the current advisor can adjust the student's activities to satisfy the change in interest.
- In other cases, the student needs to discuss the change with the prospective new advisor and obtain agreement that the student can be accommodated in the group and that funds are available to support the student on a project.
- The student needs to coordinate completion of final project tasks with the current advisor. If the student is supported by a research assistantship, financial support for the student will be changed once these tasks are completed.
- The student will prepare a letter for the Chairs of the EP Department and of the Graduate Studies Committee to inform them of the change and the plans for the transition. The student will have the letter signed by both the current and new advisors.

- If the student has an approved doctoral plan, a new doctoral plan needs to be prepared and approved by the Department at the earliest practical time.
- In the unlikely situation that the student has already passed the preliminary examination, the student would work with the new advisor to revise the preliminary document and give a proposal presentation to the new dissertation committee. The student will also consult with the EP Graduate Coordinator as to whether a new Graduate School warrant is required for the change in topic.

Change prompted by research-group climate

A rare change of advisor that is prompted by the research-group climate implies the possibility that the current research advisor is not meeting expectations with respect to the mentor/mentee relationship. As described in the expectations policy, the student should first seek advice from members of the Graduate Studies Committee and/or the Department Chair or the College Associate Dean for Graduate Affairs. The student should follow the Department and College grievance procedures, especially if third-party intervention is needed. With reasonable evidence or demonstration of a research-group climate that is not beneficial to the student, the following will apply:

- The Engineering Physics Graduate Studies Committee and the Department Chair will share information on the situation and decide what steps are appropriate.
    - They will determine whether it is possible for the student to continue working on the same project under the supervision of another faculty member.
    - Where that is not possible, they will help the student identify a new group and topic.
    - The Chairs of the Engineering Physics Department and the Graduate Studies Committee will meet with the current advisor to plan steps for the current advisor to improve his or her research-group climate.
- When appropriate, the EP Department will arrange assistantship support so that the student may leave the group without delay.
    - The source of the funding can be from the current advisor's grant that is funding the student's project or from the current advisor's flexible funds (startup, professorship, etc.).
    - In cases where the current advisor is an affiliate of the EP Department, the Department will seek funding from the advisor's home department, subject to College policies.
    - If the student completes the original project under supervision of a different faculty member, the garnered support will continue until the student graduates, a new source of support is obtained, or the student exceeds the period of guaranteed support.
    - If the student transitions to a different topic, the garnered support will be limited to no more than one year in duration.
    - The use of office space and equipment related to research will transition fully to that provided by the new advisor without delay.

Grievance Procedure

Students who feel that they have been treated unfairly have the right to a prompt hearing of their grievance. Such complaints may involve course grades, classroom treatment, advising, various forms of harassment, or other issues. Any student or potential student may use these procedures.

Procedures for proper accounting of student grievances:

- The student should speak first with the person toward whom the grievance is directed. In most cases, grievances can be resolved at this level.
- Should a satisfactory resolution not be achieved, the student should contact the program's Grievance Advisor to discuss the grievance. The Graduate Student Coordinator can provide students with the name of this faculty member, who facilitates problem resolution through informal channels. The Grievance Advisor is responsible for facilitating any complaints or issues of students. The Grievance Advisor first attempts to help students informally address the grievance prior to any formal complaint. Students are also encouraged to talk with their faculty advisors regarding concerns or difficulties if necessary. University resources for sexual harassment concerns can be found on the UW Office of Equity and Diversity website.
- If the issue is not resolved to the student's satisfaction, the student can submit the grievance to the Grievance Advisor in writing, within 60 calendar days of the alleged unfair treatment.
- On receipt of a written complaint, a faculty committee will be convened by the Grievance Advisor to manage the grievance. The program faculty committee will obtain a written response from the person toward whom the complaint is directed. The response will be shared with the person filing the grievance.
- The faculty committee will determine a decision regarding the grievance. The Grievance Advisor will report on the action taken by the committee in writing to both the student and the party toward whom the complaint was directed within 15 working days from the date the complaint was received.
- At this point, if either party (the student or the person toward whom the grievance is directed) is unsatisfied with the decision of the faculty committee, the party may file a written appeal. Either party has 10 working days to file a written appeal to the College of Engineering.

A student may be reluctant to approach the person against whom the grievance is directed, or to that person's supervisor, or to anyone else in the administrative hierarchy. In that case, the student should seek a person who can guarantee confidentiality to the extent allowed by the law and University policy and can act as an Ombuds to provide non-judgmental advice as to appropriate next steps. Note that if criminal activity is involved, confidentiality cannot be guaranteed. The College Assistant Dean of Graduate Affairs or any faculty member of the College of Engineering trusted by the student can either serve the Ombuds role or direct the student to someone who can assure confidentiality.

The Assistant Dean for Graduate Affairs (engr-dean-graduateaffairs@engr.wisc.edu) provides overall leadership for graduate education in the College of Engineering (CoE) and is a point of contact for graduate students who have concerns about education, mentoring, research, or other difficulties.

The Graduate School has procedures for students wishing to appeal a grievance decision made at the college level. These policies are described in the Academic Policies and Procedures at https://grad.wisc.edu/academic-policies/.

Hostile and Intimidating Behavior

Hostile and intimidating behavior, sometimes known by the shorthand term "bullying," is defined in university policy as "unwelcome behavior pervasive or severe enough that a reasonable person would find it hostile and/or intimidating and that does not further the University's academic or operational interests."

Hostile and intimidating behavior (HIB) can occur in the university setting. Even individual instances of such behavior can have a significant effect on the person it's aimed at, and can take a physical and emotional toll, reduce the effectiveness of a person's work or learning. It is a significant reason for unhealthy workplace climate and culture, and it should be addressed immediately. Hostile and intimidating behavior is prohibited by university policy.

What is Hostile and Intimidating Behavior?

Hostile and intimidating behavior is defined as unwelcome behavior pervasive or severe to the extent that it makes the conditions for work inhospitable and impairs another person's ability to carry out his/her responsibilities to the university, and that does not further the University's academic or operational interests. A person or a group can perpetrate this behavior. The person need not be more senior than or a supervisor to the target. Unacceptable behavior may include, but is not limited to:

1. Abusive expression (including spoken, written, recorded, visual, digital, or nonverbal, etc.) directed at another person in the workplace, such as derogatory remarks or epithets that are outside the range of commonly accepted expressions of disagreement, disapproval, or critique in an academic culture and professional setting that respects free expression;
2. Unwarranted physical contact or intimidating gestures; Conspicuous exclusion or isolation having the effect of harming another person's reputation in the workplace and hindering another person's work;
3. Sabotage of another person's work or impeding another person's capacity for academic expression, be it oral, written, or other;
4. Abuse of authority, such as using threats or retaliation in the exercise of authority, supervision, or guidance, or impeding another person from exercising shared governance rights, etc.

Repeated acts or a pattern of hostile and/or intimidating behaviors are of particular concern. A single act typically will not be sufficient to warrant discipline or dismissal, but an especially severe or egregious act may warrant either.

What to do if you feel you've been the target of hostile and intimidating behavior:

Undesired consequences of hostile and intimidating behavior can be avoided or minimized when the problem is addressed early on, but victims are often hesitant to pursue a formal process before the impact is severe. Educational opportunities and campus resources have been

implemented with the intent of aiding all employees and students in defusing situations before they become severe. These resources, including trained personnel who can advise and mediate, comprise the "informal process." It is possible that situations will continue to arise in which informal interventions are not effective, and the "formal process" has been designed to address those situations.

You are encouraged to seek out advice and consultation after the first instance of hostile and intimidating behavior: consultation is not escalation. Discussing what's happened in a timely way can often prevent continued bullying. Here are some ways to do this:

1. Seek advice from a trusted colleague;
2. You may choose to seek informal resolution by approaching the individual yourself or with an intermediary (also see https://hr.wisc.edu/hib/addressing-hib/);
3. Consult your advisor, human resources representative, department chair, director, dean, or any campus resource to discuss options for resolution;
4. Keep notes of what happened, when, where, and who was present. Retain copies of any correspondence.

Graduate Students sometimes experience hostile and intimidating behavior from faculty members. If you are a student who is experiencing such behavior, you are entitled to support as a university employee through the Ombuds office, the Dean of Students office, and (if a grad student) the Graduate School. Graduate student workers should also consult with Graduate Coordinators, TAA Stewards, and/or the Graduate School.

EP graduate students with concerns may contact the Chair of the Graduate Studies Committee, the EP Grievance Advisor, or the College of Engineering Assistant Dean for Graduate Affairs (engr-dean-graduateaffairs@engr.wisc.edu). Additional campus information on hostile and intimidating behavior is available at https://hr.wisc.edu/hib/.

Academic Integrity

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to https://conduct.students.wisc.edu/academic-integrity/.

Also see the Graduate School's policies on academic misconduct, https://grad.wisc.edu/documents/misconduct-academic/.

Parental Leave Policy for Graduate Student Assistants

The College of Engineering (CoE) is fully committed to providing a climate of support for women and their partners who choose to have children during their graduate studies. The goal of this

CoE parental leave policy is to reduce academic and financial hardships for a) female graduate students during the late stages of their pregnancy, childbirth, and postpartum periods, and b) any graduate student who is a new parent providing care for his/her infant.

All CoE graduate students with current research, teaching, or project assistantships are eligible to request a parental leave under this policy. Upon request, expectant mothers will be provided with 12 weeks of paid accommodation time for childbirth. Other new parents (father, adoptive mother, adoptive father) will, upon request, be provided with 6 weeks of paid accommodation time. There will be no research or teaching expectations of the student during the leave.

Students should ideally notify their department (through the Department Administrator or Department Chair) six months prior to the expected birth to request the leave. Students should alert their research advisor or TA coordinator at that time as well to ensure that the ongoing research and teaching environment is safe for the expectant mother. It is recognized that each case will be unique in terms of the timing of the pregnancy or adoption relative to the academic calendar, and that creative and supportive solutions will be required on the part of advisors, chairs, TA coordinators, etc.

The leave will ordinarily begin at the time of birth, but other proposals will be considered. Departments – both advisors and chairs – are expected to provide flexibility in working out the details of the leave and to adjust the timeline of the leave as needed to accommodate any unexpected medical issues that arise during pregnancy (e.g. doctor-ordered bed rest).

All academic requirement deadlines (e.g., qualifying exams) will be extended for the student requesting the leave, consistent with department academic timelines.

Accommodations for Students with Disabilities

The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty will work either directly with the student or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA." For more information, visit https://mcburney.wisc.edu/.

Training Requirements

Safety

Whether working in a laboratory or other settings, safety is of paramount importance. To inform students of proper procedures and reporting requirements, the department has a one-time safety training requirement for all graduate students, regardless of whether a student works in a

laboratory. The safety training materials are available online at https://canvas.wisc.edu/courses/172200.

Research Ethics

The research enterprise and the development of new technology depend on scientists and engineers working with the highest levels of integrity. In addition, there are areas of research that must consider whether certain technological developments are in the public's interest. To raise awareness of these and related issues, the College of Engineering has established an annual ethics training requirement for graduate students. Seminars and other sessions that satisfy this requirement are announced to students. Taking part in at least one session per academic year is required of all Nuclear Engineering and Engineering Physics graduate students, regardless of whether a student conducts research.

Exit Interviews

The EP Department will conduct interviews of all graduate students who complete their degrees and of those who leave without completing a degree. Two formats will be available: students will be encouraged to meet with a member of the Graduate Studies Committee, but they will be allowed to complete an online survey when an in-person meeting is not practicable. Specific survey questions may be adjusted over time, but they will need to cover at least the following topics:

1. The student's degree of satisfaction with mentor/mentee relationships,
2. The quality of the research experience,
3. Whether the climate of the research group was constructive,
4. Coursework requirements and options that contributed greatest and least to the student's professional knowledge,
5. Whether the climate of the EP Department was supportive of the student's professional development, and
6. The extent to which the EP graduate experience prepared the individual for forthcoming career steps.

Engineering Physics Faculty

Name	Title	Office	Phone	E-mail Address
Paul Wilson	Professor and Chair	153 ERB	263-0807	paul.wilson@wisc.edu
Matthew S. Allen	Associate Professor	525 ERB	890-1619	matt.allen@wisc.edu
Laura Bartol	Faculty Associate	433 ERB	263-3703	ljplesha@wisc.edu
Vicki Bier	Professor (also IE/GNI)	3270A ME	262-2064	vicki.bier@wisc.edu
Riccardo Bonazza	Professor	537 ERB	265-2337	riccardo.bonazza@wisc.edu
Curt Bronkhorst	Professor	507 ERB	890-2586	cbronkhorst@wisc.edu
Jennifer Choy	Assistant Professor	535 ERB	263-6974	jennifer.choy@wisc.edu
Adrien Couet	Assistant Professor	425 ERB	265-7955	couet@wisc.edu
Wendy Crone	Professor	543 ERB	262-8384	wendy.crone@wisc.edu
Stephanie Diem	Assistant Professor	329 ERB	263-1414	sjdiem@wisc.edu
Jennifer Franck	Assistant Professor	527 ERB	263-2562	jafranck@wisc.edu
Benedikt Geiger	Assistant Professor	325 ERB	262-3386	benedikt.geiger@wisc.edu
Chris C. Hegna	Professor	521 ERB	263-0810	hegna@engr.wisc.edu
Antonio Hernandez	Faculty Associate	503 ERB		ahernandez2@wisc.edu
Douglass Henderson	Professor	439 ERB	263-0808	dlhender@wisc.edu
Roderick S. Lakes	Professor	541 ERB	265-8697	rlakes@wisc.edu
John Murphy	Faculty Associate	429 ERB	265-4186	jmurphy@engr.wisc.edu
Sonny Nimityongskul	Faculty Associate	503 ERB		apnimityongs@wisc.edu
Jacob Notbohm	Assistant Professor	533 ERB	890-0030	jacob.notbohm@wisc.edu
Oliver Schmitz	Professor	341 ERB	263-1547	oschmitz@wisc.edu
Leslie Smith	Professor (also Math)	825 VV	263-3057	lsmith@math.wisc.edu
Carl R. Sovinec	Professor	519 ERB	263-5525	csovinec@wisc.edu
R. Thevamaran	Assistant Professor	539 ERB	262-5724	thevamaran@wisc.edu
Fabian Waleffe	Professor (also Math)	819 VV	262-3269	waleffe@math.wisc.edu
Yongfeng Zhang	Assistant Professor	917 ERB	890-3779	yzhang2446@wisc.edu

Graduate Student Services Office

The College Graduate Student Services Office is located in 3182 Mechanical Engineering. Questions about the application process can be directed to neepgradadmission@engr.wisc.edu. For assistance with Graduate School requirements and warrant requests, contact Sara Hladilek, shladilek@wisc.edu, 262-8617.

Engineering Physics Administrative Staff

Name	Title	Office	Phone	E-mail address
Dina Christenson	Assistant Dept. Admin	145 ERB	263-5966	Dina.christenson@wisc.edu
Lauren Gee	Research Admin	143 ERB	263-2196	llgee@wisc.edu
Nancy Griego	Research Admin	107 ERB	263-2352	Nancy.griego@wisc.edu
Talvick Hook	Financial Specialist	153 ERB	263-1646	thook@wisc.edu
Tim Jensen	Comm. Spec.	147 ERB	265-5092	timjensen@wisc.edu
Dennis Manthey	Dept. Administrator	146 ERB	263-1647	Dennis.manthey@wisc.edu
Jesse Prochaska	Accountant	109 ERB	890-3580	jjprocha@wisc.edu
Kathy Wegner	Financial Specialist	111 ERB	263-8142	wegner@engr.wisc.edu

APPENDIX A: NEEP Degree Timelines

Engineering Mechanics and Nuclear Engineering and Engineering Physics **Master's** Timeline

Steps towards your degree

- Coursework MS Option:
  - Begin coursework
  - Complete coursework
  - Have advisor check progress toward Department degree requirements
  - Request MS warrant several weeks before oral exam and/or graduation
  - Take oral exam→NEEP Only
  - MS Degree Awarded

- Thesis MS Option
  - Begin coursework
  - Identify research advisor and topic
    - Sign up for Research EMA 790 or NE 790
  - Complete research and write thesis
  - Have advisor check progress toward Department degree requirements
  - Request MS warrant several weeks before oral exam
  - Thesis Oral Defense
  - MS Degree awarded

(Appendix A cont'd)

Engineering Mechanics and Nuclear Engineering and Engineering Physics **PhD** Program Timeline

Steps towards your degree

- Identify research advisor before arriving on campus or during your first semester
- Begin coursework and start research (EMA 890 or NE 890)
- Take Qualifying Exam (third or fourth semester)
- Finish MS coursework
  - Request MS warrant if an MS is desired
- Submit Doctoral Plan (semester after passing Qualifying Exam)
- Minor Requirements Completed (another 1-3 semesters)
- Write Prelim
- Request Prelim Warrant several weeks before Prelim Exam
- Take Prelim Exam (submit signed warrant to Graduate School **after** coursework is completed)
- Dissertator (EMA 990 or NE 990)
- Finish Thesis
- Have advisor check progress toward Department degree requirements
- Request Final Warrant several weeks before Prelim Exam
- Defend Thesis
- Warrant signed
- Thesis must be completed within 5 years of Prelim Exam
- Make Corrections
- Final Appointment at Graduate School (turn in final warrant, etc.)
- Deposit bound thesis copy to Department and Advisor
- PhD Degree awarded

APPENDIX B: Sample Doctoral Plan Format

STATEMENT OF DOCTORAL PLAN

Date:
To: Carl Sovinec, Graduate Studies Committee Chair
From:
Subject: NEEP Doctoral Plan

A. TECHNICAL COURSEWORK IN GRADUATE SCHOOL (already taken or to be taken)

Course #	Course Title	Credits	Date	Grade	M.S.	Count for Tech. Min.
NE 408	Ionizing Radiation	3	F/00	A	Y	
NE 427	Nuclear Instrum Lab	2	F/00	AB	Y	
ECE 430	Random Signal Analysis	3	F/91	A	Y	
NE 525	Introduction to Plasmas	3	F/90	A	Y	
NE 526	Lab Course in Plasmas	3	S/01	A	Y	
NE 527	Plasma Confinement & Heating	3	F01	A	Y	
Phys 546	Lasers	2	S/01	A	Y	Y
Phys 623	Electronic Aids to Measurement	4	F/00	A	Y	Y
Phys 625	Applied Optics	4	S/02	A		Y
NE 724	Waves & Instabilities in Plasmas	3	S/01	A	Y	
NE 725	Plasma Kinetic Th & Rad Proc	3	F/01	A		
NE 741	Interaction of Radiation with Matter I	3	F/00	A	Y	
NE 742	Interaction of Radiation with Matter II	3	S/02	B		
Phys 805	Topics in Fluid and Plasma Turbulence	3	S/03	--		
	Total Credits	41				

B. PROPOSED AREA OF THESIS RESEARCH

I propose to do my thesis research on plasma diagnostics on TFTR. Professor Plasma will be my thesis advisor.

C. BREADTH REQUIREMENT

List one course in each area. The courses should also be shown in Section A.

Area	Course No.	Course Title
Fission	NE 408	Ionizing Radiation
Plasma Physics & Fusion	NE 527	Plasma Heating & Confinement
Materials	NE 423	Nuclear Materials
Eng'r Math & Computation	EP 547	Advanced Engineering Math I

D. TECHNICAL MINOR

I chose the distributed minor option; see courses listed above.

E. NON-TECHNICAL MINOR

My non-technical minor will be in Study Option III. The courses I have taken to complete this minor are:

Course No. and Title	Credits	Date	Grade
East Asian 123 Elementary Japanese I	3	Spring 2002	A
East Asian 124 Elementary Japanese II	3	Fall 2002	A

Prof. Douglass Henderson, the Department Non-Technical Minor Advisor, approved this minor on Jan. 31, 2015.

F. EXAMINING COMMITTEE

My advisor, Professor Plasma, recommends the following five persons constitute my Preliminary Examination Committee and, if practical, my Final Oral Committee:

_____
_____
_____
_____
_____

I have obtained the consent of each person listed to serve on these committees. At least one of these members is from outside the NEEP Graduate Program.

G. MASTER'S THESIS

I did not perform a Master's thesis. (If applicable, give title, major professor, institution.)

H. Ph.D. QUALIFYING EXAM

I passed the Ph.D. qualifying exam on _____.

I. DEGREES HELD

I have previously received the following degree:

Bachelor of Science in Applied Physics, 1999, Michigan Technological University and
Masters of Science in Applied Physics, 2001, Michigan State University

J. PERTINENT GRADUATE COURSES

I have taken the following graduate courses at _____ which are particularly significant in my present plans:

Course No. and Title	Credits	Date	Grade

K. PERTINENT UNDERGRADUATE COURSES

I have taken the following undergraduate courses at Michigan Tech. which are particularly significant in my present plans:

Course No. and Title	**Credits**	**Date**	**Grade**

The following courses were taken as a graduate student at UW to satisfy admission requirements:

Course No. and Title	Credits	Date	Grade
MS&E 351 Struct & prop Rel'ns of Solids	3	Spring 2001	AB

Respectfully submitted:

_____

(signature)

I have checked and approved this statement:

_____(Major Professor) (signature of Major Professor)

Approved by the Department:

_____ _____

(signature of Graduate Studies Chair) **(date)**

APPENDIX C: Master's Thesis Advisor Approval Sheet

The form appearing on the following page may be printed and completed, including your advisor's original signature, for submission to the Memorial Library with the unbound copy of your thesis. Do not count it as a numbered page in your thesis. Check the Graduate School's web page https://grad.wisc.edu/current-students/masters-guide/ for additional information.

Department of
Engineering Physics
UNIVERSITY OF WISCONSIN–MADISON

Master's Thesis Approval

Thesis Title: _____

_____

Author: _____

APPROVED

Advisor's Signature: _____

Advisor's Title: _____

Date Signed: _____