

Nuclear Engineering Department Graduate Student Handbook



THE UNIVERSITY OF
TENNESSEE
KNOXVILLE

DEPARTMENT OF
NUCLEAR ENGINEERING

Tickle College of Engineering
University of Tennessee, Knoxville
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1. Message from the Department Head



Welcome to the University of Tennessee's Nuclear Engineering (UTNE) Department. We strive to provide the best environment possible for the learning and career development of our students, within a rigorous safety culture, and with a focus on continual improvement.

The information provided in this graduate handbook is intended to be one source to help students navigate the policies, procedures, and practices surrounding graduate school in the Nuclear Engineering Department. It is certainly not all inclusive, but important links will be provided to steer students towards other valuable information sources. We hope you will find this document useful.

We are fortunate to call east TN home, with a rich history in nuclear power and innovation, and close ties to more than 150 nuclear companies and organizations within 50 miles of Knoxville, including 2 national laboratories ([Oak Ridge National Laboratory](#), UCOR and the [Y-12 Nuclear Security Complex](#)) and the [Tennessee Valley Authority](#), and outstanding research facilities. In addition to traditional nuclear engineering, concentrations in radiological engineering are also offered at all levels incorporating health physics, radiochemistry and nuclear medicine, medical physics, and radiological assessment. The UT Nuclear Engineering program hosts the largest nuclear engineering PhD program in the United States, and our graduate program is currently ranked as the #2 public (#3 overall) program in the nation by U.S. News and World Report.

The faculty, students, and staff of the UTNE Department are committed to actionable items that provide an inclusive and welcoming environment. Students, faculty, and staff are also encouraged to participate in our Retention and Access Development (RAD) committee and associated activities.

If you desire additional information, please contact us by email at utne@utk.edu.

Brian Wirth

Department Head and UTK-ORNL Governor's Chair Professor of Computational Nuclear Engineering

2. Introduction

Established in 1957, the UT Department of Nuclear Engineering is the first department and one of the oldest most prestigious programs in the United States. The Nuclear Engineering Department strives to develop and maintain a nationally and internationally recognized program that promotes a passion for understanding and applying the knowledge of nuclear science and engineering and develops the next generation of technical leaders of the global nuclear enterprise. Our faculty consists of diverse research expertise; many worked in national labs and/or in industry and are considered to be national and global leaders in their respective fields. Students gain expertise as scientists and engineers who advance radiation detection, nuclear security, nuclear fuel cycles, fusion technology, reliability and safety, health physics, and other areas of basic research. Visit the Graduate Admissions website <<https://gradschool.utk.edu/admissions/>> and the Graduate Catalog <<http://tiny.utk.edu/grad-catalog>> for more information on applying to the Nuclear Engineering Department's graduate programs.

The Department of Nuclear Engineering offers programs leading to the Master of Science and Doctor of Philosophy degrees, and several Graduate Certificates. There is also a Medical Physics program that began in Fall 2019. All programs are designed for graduates of accredited undergraduate programs in engineering, physics, chemistry, or mathematics.

To serve the mission and vision of the Graduate School and preserve the integrity of graduate programs at the University of Tennessee, Knoxville, information related to the process of graduate education in each department is to be provided for all graduate students.

Based on Best Practices offered by the Council of Graduate Schools, it is important that detailed articulation of the information specific to the graduate degrees offered in each department/program be disseminated. The Department Graduate Handbook does not deviate from established Graduate School Policies <<http://tiny.utk.edu/grad-policies>> noted in the Graduate Catalog, but rather provides the specific ways in which those policies are carried out.

- The purpose of the Graduate Handbook is to provide Nuclear Engineering Departmental specific information in one document. This information is subject to change, and this document will be updated annually.
- Graduate students are expected to be aware of and satisfy all regulations governing their work and study at the University. Students should be directed to the Graduate Catalog <<http://tiny.utk.edu/grad-catalog>>, to Hilltopics (Official UTK Student Handbook) <<http://hilltopics.utk.edu>> to the publications on the Appeals Procedure <<http://gradschool.utk.edu/graduate-student-life/understanding-your-rights-and-obligations/>>, and to the Graduate School forms website

<<https://gradschool.utk.edu/forms-central/>> for graduation requirements.

- The Nuclear Engineering Graduate Program Committee is responsible for activities such as coordinating the Ph.D. qualification exam (considered the first part of the Ph.D. comprehensive exam), recruiting top domestic and international students, financial support recommendations, and annually updating the graduate handbook. The Department Head appoints a chairperson and at least two other members to the Graduate Program Committee.
- The Director of Graduate Studies is Dr. Brian Wirth. The members of the Graduate Program Committee are: Dr. Khalid Hattar and Dr. Ivis Chaple (co-chairs), Dr. Maik Lang, Dr. Xingang Zhao, and Amanda Lovelace (*Graduate Program Coordinator*).

3. Admission Requirements & Application Procedures

Admission to the program requires a Bachelor's degree from a college or university accredited by the appropriate regional accrediting agency. A foreign degree must be equivalent to a US Bachelor's degree and must be accredited by its regional or national accreditation agency. An official transcript must be provided from the former college or university. For international students, a list of the possible means for submitting official transcripts depending on the country of origin is available on the Graduate School's website <<http://gradschool.utk.edu/future-students/office-of-graduate-admissions/applying-to-graduate-school/>>. Contact gradschool@utk.edu via email for any additional questions on admissions.

The decision for admission is based upon the applicant's GPA, TOEFL or IELTS scores (for applicants whose native language is not English), letters of recommendation, and research statement. College professors, research advisors, and summer internship mentors who have first-hand knowledge of your academic and scholarly performance and capabilities make good reference providers. We recommend that applicants explore our research focuses and our faculty to investigate research topics that may be of interest and fit with applicants' career goals <<http://ne.utk.edu/research/focus-areas/>>. Prospective students are required to provide an essay describing their research interests. US degree holders must have earned a 3.0 out of a possible 4.0 GPA or a minimum of 3.0 during their senior year of undergraduate study. Foreign degree holders must have earned a minimum of 3.0 on a 4.0 scale or other equivalent to a B average. If you have completed previous graduate coursework, you must have a GPA of 3.0 on a 4.0 scale or the equivalent. The average GPA of admitted students in recent years is between 3.6 and 3.7 on a 4.0 scale.

Applicants whose native language is not English must submit TOEFL or IELTS test scores. To be fully admitted, applicants must submit a minimum score of 550 on the paper-based TOEFL, 80 on the TOEFL iBT, or 6.5 on the IELTS. Applicants may be eligible for English Proficiency Conditional Admission.

Admission to the program is through the Office of Graduate Admissions and online application procedures can be found at <http://graduateadmissions.utk.edu/>. Application deadlines are given at <https://ne.utk.edu/graduate-program/admissions/>. Meeting minimum standards does not guarantee admission to the program, and the entire package of submitted materials—GPA, letters of recommendation, and research statement—is considered holistically.

All entering students must have, as a minimum, competency in mathematics through ordinary differential equations, competency in atomic and nuclear physics, and competency consistent with an introductory course in nuclear engineering. If such competencies do not exist; the student must take appropriate courses for undergraduate credit. In addition, students without a BS degree in nuclear engineering, or the equivalent, must take 433 (Radiation Protection) and 470 (Nuclear Reactor Theory I), both of which may be taken for graduate credit. Contact the department for more information at utne@utk.edu. The Graduate Catalog contains policy and procedure information related to the graduate program <http://tiny.utk.edu/grad-catalog>.

International students are strongly encouraged to start the US VISA application as soon as possible after admission, since there may be some delay in VISA interview appointments, depending on the country and on the availability of consular services. International students should contact the Center for Global Engagement (CGE <https://cge.utk.edu/>; cge@utk.edu) in order to have a clear understanding of the steps needed to apply for a VISA, as well as the required documents and costs associated to it.

3.1 Financial Support

The university is committed to providing quality education at a reasonable cost, and a number of programs have been developed to help graduate students finance their studies. If graduate students have 20-hour per week support (a 50% assistantship) such as with a GRA, GTA/GRA, or other assistantship or fellowship that requires 20 hours per week of work, they should not have additional work requirements outside of the University during the academic year (from August to April for payroll purposes, mid-August to mid-May in actual calendar time). This means that a student on a full GRA should not have an external job or perform external consulting work. We make this requirement because history has shown that graduate students who have a 50% assistantship while attending UTNE and also try to maintain an additional external work load are not successful in our program.

Doctoral students who have started taking course NE 600 Dissertation and wish to do an internship/practicum that is relevant to their degree, but not specific to the dissertation, can petition to be exempted from the Continuous Enrollment requirement for a maximum of up to three semesters or 12 months. The petition should be submitted before the student participates in an internship/practicum, describe the nature of the internship/practicum, and must include justification. Approval must be granted first by the student's advisor, then the Department or Unit, followed by the Graduate School. Multiple

terms may be separate in time or back-to-back. Students whose petition is approved need not sign up for any coursework while doing the internship/practicum except international students must always check with the [Center for Global Engagement](https://cge.utk.edu) (CGE) [<https://cge.utk.edu >](https://cge.utk.edu) to ensure that they remain compliant with their specific type of visa. The time limit to degree is not extended as a result of an internship/practicum. The petition form is available at the [Graduate School's Forms Central](https://gradschool.utk.edu/academics/forms-central/) [<https://gradschool.utk.edu/academics/forms-central/ >](https://gradschool.utk.edu/academics/forms-central/).

3.2 Departmental Graduate Assistantships

The Nuclear Engineering Department has Graduate Teaching Assistant (GTA) and Graduate Research Assistant (GRA) openings with extremely competitive stipends, especially considering the relatively low cost of living in Knoxville. The Nuclear Engineering Department has the largest Nuclear Engineering Ph.D. enrollment in the country and nearly all these students are fully funded through the university and other external entities. The NE department strives to maintain a common pay scale for all graduate students. Stipend amounts are competitive and included in your offer letter. GTA offer letters will specify a limited duration; typically for one semester. Beginning August 2025, GRA offer letters will be renewed each academic year depending on the availability of funding and the satisfactory academic and research performance of the student.

3.3 Funded Graduate Student Performance Expectations

Students receiving financial support provided by the University of Tennessee, Tickle College of Engineering, or Nuclear Engineering Department are expected to make progress towards their degree and meet the performance expectations of their graduate advisors. If a student works as a GTA, they are expected to work on average 10 hours per week and return graded assignments in a timely manner as defined by the course 5 instructor. Failure to achieve set goals will result in a warning and areas of improvement will be identified. If performance does not improve within an agreed upon time, your Graduate Assistantship (tuition waiver and stipend) will be subject to termination. More detailed information on UTK assistantships and related policies can be found at [< http://gradschool.utk.edu >](http://gradschool.utk.edu). More details on graduate student performance and mentorship can be found in Section 4. Please review this, as it is essential to understand what is expected of you and others.

3.4 Other Financial Aid

The Graduate School has several assistantship and fellowship opportunities, some of which can be found here: [< http://gradschool.utk.edu/graduate-student-life/costs-funding/graduate-assistantships/ >](http://gradschool.utk.edu/graduate-student-life/costs-funding/graduate-assistantships/). Another recent opportunity is the UT-ORII Graduate Advancement, Training, and Education program [< https://utorii.com/gate/ >](https://utorii.com/gate/). For other opportunities, speak with your Major Professor.

3.5 External Fellowship and Scholarship Opportunities

National organizations – such as the Department of Energy, the American Nuclear Society, and the National Academy for Nuclear Training – also offer excellent fellowship and scholarship opportunities for nuclear engineering graduate students. The department, especially your Major Professor, can provide information and assistance in applying for these fellowships. An especially good time to apply for these fellowships is the fall semester before you start graduate school or your first fall semester. Obtaining a prestigious fellowship is a benefit to your curriculum vitae, showing your ability to support your own work.

- US Department of Energy Student Programs and Internships <<https://www.energy.gov/careers/students-recent-graduates>>, US Department of Energy Internship Programs and Other Opportunities – from the website, which points to a variety of opportunities: “DOE is a solutions-focused agency engaged in a wide range of challenging and innovative work, from national security to basic research, that impacts the world in incredible ways.”
- US Department of Energy Nuclear Energy University Program, <<https://www.energy.gov>> The US Department of Energy, Office of Nuclear Energy Fellowship Program supports nuclear engineering students conducting their graduate work engineering and science programs related to nuclear energy.
- NASA Space Technology Graduate Research Opportunity (NSTGRO), <<https://www.nasa.gov/directorates/spacetech/strg/nstgro>>. For U.S. citizen and permanent resident graduate students who show significant potential to contribute to NASA’s goal of creating innovative new space technologies for our Nation’s science, exploration and economic future; involves a generous stipend and an annual 6-10 week visiting technologist experience at NASA Centers and/or at nonprofit U.S. R&D laboratories.
- National Science Foundation (NSF) Graduate Research Fellowship Program (GRFP), < <https://www.nsfgrfp.org> >, the NSF Graduate Research Fellowship Program recognizes and supports outstanding graduate students in NSF-supported science, technology, engineering, and mathematics disciplines who are pursuing research-based Master’s and doctoral degrees at accredited United States institutions.
- DOE NNSA Stewardship Science Graduate Fellowship, < <https://www.krellinst.org/ssgf/how-apply> > , The Department of Energy National Nuclear Security Administration Stewardship Science Graduate Fellowship (DOE NNSA SSGF) program provides outstanding benefits and opportunities to students pursuing a Ph.D. in areas of interest to stewardship science, such as properties of materials under extreme conditions and hydrodynamics, nuclear science, or high energy density physics. The fellowship builds a community of talented and committed doctoral students that solve complex science and engineering problems

critical to stewardship science (national defense); fellows are provided opportunities to work with some of the nation's most sophisticated and powerful experimental and computational facilities at DOE NNSA national laboratories.

- American Nuclear Society Scholarships, < <https://www.ans.org/scholarships/> >. The American Nuclear Society believes in rewarding its members for their academic, services and leadership excellence. To do so, scholarships are granted to qualified student members of ANS who have demonstrated a high commitment to the standards set by the Society.
- Society of Women Engineers (SWE) Scholarships, < <https://swe.org/scholarships/> >. SWE Scholarships support women pursuing ABET-accredited bachelor or graduate student programs in preparation for careers in engineering, engineering technology and computer science in the United States.
- Roy G. Post Foundation Scholarship, < <http://www.roygpost.org/roypost/Scholarship> >. The Roy G. Post Foundation is a non-profit organization formed by his students, peers and protégés to provide scholarships to students to develop careers in the safe management of nuclear materials and to participate in the WM Conference.
- Rickover Fellowship Program in Nuclear Engineering, <<https://www.scuref.org/program/rfp-01/>>. The program will assist in preparing students for roles in naval nuclear propulsion and will support the broader objective of advancing fission energy development through the research efforts of the fellows.
- Nuclear Nonproliferation International Safeguards Graduate Fellowship Program, < <https://www.scuref.org/nnis/>> This fellowship provides financial support for exceptional students pursuing technical doctoral research relevant to the field of international safeguards. Participating universities foster partnerships between science/engineering programs and programs focused on nuclear nonproliferation and safeguards policy. Armed with both deep technical expertise and policy understanding, NNIS Fellows are primed to take on the exciting and challenging work of international nuclear safeguards.
- SMART Scholarship administered by the National Defense Education Program, <<https://www.smartscholarship.org/smart>>. The Science, Mathematics and Research for Transformation (SMART) Scholarship-for-Service Program is an opportunity for students pursuing an undergraduate or graduate degree in Science, Technology, Engineering, and Mathematics (STEM) disciplines to receive a full scholarship and be gainfully employed by the Department of Defense (DoD) upon degree completion.

- The NNSA Graduate Fellowship Program. < <https://www.pnnl.gov/projects/ngfp>> This program identifies and develops the next generation of exceptional national security leaders to achieve the NNSA mission: Strengthening our nation through nuclear security. It provides fellowship support for one year while you are not working on your graduate studies, perhaps between MS and Ph.D. work and after completion of your degree.

3.6 Travel Support

The Nuclear Engineering Department funds approximately \$650,000 a year in faculty, staff and student travel. Departmental travel assistance should be provided by the student's Major Professor. Other travel support, such as the Graduate Student Travel Fund, < <https://gss.utk.edu/gss-travel-awards/> > could also be utilized to attend national and international workshop and conferences. Selected conferences may also have their own sources of student travel support that are described on the conference website.

For all travel requests, a "NE Travel Request Form" must be submitted a minimum of 2 to 3 weeks prior to domestic travel (6 to 8 weeks prior to international travel). The travel request must be approved by the faculty member who is working with the student. More information is provided as an appendix to this document. Questions should be sent to the student's Major Professor or to <netravel@utk.edu>.

Note that students are expected to coordinate with the faculty member who is working with them on the travel. The Department does not typically pay for travel unless it is associated with a sponsored project. There are some exceptions to this. The most important thing is to consult the faculty member who you are working with to discuss how the travel will be supported. In the event that there is not funding support for the travel in a sponsored project, the faculty member may discuss possible funding opportunities with the Department.

4. Graduate Student Assistant Responsibilities, Duties, and Mentorship Expectations

The graduate student work-study experience is expected to be a transformational learning and development process. Graduate school is an opportunity to learn what is expected of you in your research and professional career. It is also the place to learn and apply a new way of thinking about challenges and opportunities in the world, while simultaneously working safely, maintaining excellent ethical standards, and working in an atmosphere that cultivates mutual respect.

The graduate student work-study experience is also unique to each student. Graduate school is a truly holistic opportunity to develop. Graduate students may seek mentorship and learning opportunities from their advisors, program managers, laboratory supervisors, postdocs, and each other. In addition, these same mentors also learn from the

graduate students. Graduate school is also a place to explore academic opportunities, including mentorship of other less senior graduate and undergraduate students, as well as teaching opportunities. Graduate students should also expect to be encouraged to engage with unique learning opportunities such as attendance at a seminar, relevant conferences, etc. Graduate school is supposed to be an invigorating and deeply rewarding experience that challenges a student in entirely new ways.

In addition to a learning experience, graduate study is also a job, the first step in a career in research and development. Because of this, there are certain expectations required of graduate students, who are typically tasked with delivering important engineering work on a fixed schedule to financial sponsors. Graduate students must work independently and also work well with others to achieve important project goals while maintaining strong ethical standards.

It is also essential for graduate students to carefully follow University procedures, University policy and also United States and international law. On some occasions, graduate study in nuclear engineering requires handling or working with sensitive materials (e.g., related to security, export control, or business sensitive and proprietary information governed by a nondisclosure agreement). These materials require the utmost care and professionalism, while following applicable plans or rules. Additionally, sensitive experimental tools or export-controlled software require similar care and respect. Projects associated with research and development institutions (e.g., Oak Ridge National Laboratory) or industry may have access requirements and institutional policies that must be carefully followed. It is a privilege to have access to resources and facilities, so please make the effort to comply with their requirements. Graduate Teaching Assistants must carefully comply with privacy laws regarding education, for example Family Educational Rights and Privacy Act (FERPA), < <https://ferpa.utk.edu/> >.

Graduate students must treat others with respect and dignity, and they deserve to be treated with respect and dignity. The objective of this section is to outline best practices in our Department for developing guidelines and expectations for graduate student performance as well as performance expectations for mentorship. In all cases, communication is essential. (Your future employers will value this as well). Working as a team and keeping each other informed can alleviate potential misunderstandings.

It is also important to understand how research is funded and completed and for student researchers to take ownership of their roles. Faculty members write research proposals to funding agencies or partnering organizations, and, if successful, are responsible to complete the research milestones and deliverables on the proposed timeline. Faculty members hire graduate students and provide the scholarly guidance and mentorship to enable the deliverables to be met. If deliverables are not met, it is likely that the funding agency will not provide future funding to the faculty (and by extension, the student); therefore, it is the goal of the research team to perform the proposed research and complete the deliverables according to the research schedule. Since the faculty are

responsible to the funding agency to complete the deliverables, they must make sure the project is moving forward as planned or make changes as necessary.

4.1 Performance Expectation Documents

Performance expectation documents for graduate students in research groups should outline the following:

1. Access requirements and work station information, i.e., how to get access to the lab and information about your particular assigned workstation.
2. Graduate student training requirements and training records retention information.
3. Establishing graduate student semester coursework and research schedules, and, if applicable, research goals. This can include a Gantt chart or similar for research goals in a given period.
4. Laboratory best practices and safety policy information (including laboratory and/or site-specific training): working safely is always essential! Your future employers will also value this.
5. Information pertaining to security plans or technology control plans for sensitive information, including proprietary and export-controlled information, if applicable.
6. Data retention, procedure reporting, and best practices.
7. Where to go if you have questions or concerns; what the appropriate method for communicating those questions is, and what that process looks like.
8. Practice project, thesis and dissertation requirements, as applicable, including applicable identification of duration for each degree and expected pathway to degree completion.
9. Expectations or requirements for research output (including journal publications), conference attendance, and other key metrics. These may exceed departmental requirements, at the discretion of the advisor, but this should be clearly outlined up front.
10. In the case of Graduate Teaching Assistant appointments, expectations for turning back graded student work are paramount. With split appointments (GTA/GRA), the class professor, research advisor, and student must work together to make sure research deliverables and graded work are both completed on schedule. Again, communication is key to ensure expectations are met.

4.2 Mentorship Expectations

The performance expectation documents for each student should also outline expectations for mentorship. Best practices expectations for the graduate student and mentor relationship include, but are not limited to, the following:

1. Graduate student mentors must clearly define their expectations of their students in a well-organized document. These expectations should state the desired weekly time commitments and publishing frequency where applicable. Each research

group is expected to have such a document outlining expectations, which will serve as the basis for annual student performance reviews.

2. Students and mentors should engage in mutually civil communication and civility in general towards each other and their co-workers. We are all a team, and we are in this together to get our work done.
3. Students should expect their mentors to demonstrate and work with them to transfer technical expertise and knowledge in their field of study, as well as provide general guidance.
4. Mentors and students should work together to facilitate the meeting of not only the needs of the financial sponsor, but also the professional and educational goals of the student. Graduate school should be a win-win-win opportunity for the student, the mentor, and the financial sponsor. Everybody should be working together and working hard to facilitate a positive outcome. The development of graduate students should be treated holistically: not just focused on deliverables but also on other opportunities for development, like professional conferences, training sessions, etc.
5. Graduate student mentors should encourage, accept, and practice a healthy work-life balance. Graduate student mentors must also outline expectations for what this might entail.
6. Graduate students also must recognize that different projects might have varying expectations. For example, some projects may require working in a remote location or temporarily working a longer schedule to accomplish an experimental campaign or meet a particular milestone. This should be communicated by the mentor upfront, if possible, so that the student knows what they are getting into.
7. Graduate students and their mentors must both work together to practice timely communication and have sufficient availability. It is recommended that a hard response time be set at 48-72 hours from initial contact, if possible. This response can simply acknowledge the contact was received. One method to facilitate this is to share calendars amongst the group, for example, as may be relevant.

4.3 Graduate Student Support

The NE Department is committed to an inclusive and welcoming environment and to making student success our number one objective.

4.3.1 Nuclear Engineering Graduate Student Assembly (NEGSA)

The Nuclear Engineering Graduate Student Assembly (NEGSA) is a student-run organization within the Department of Nuclear Engineering which serves to increase communication both amongst graduate students and between graduate students and the Department. The mission of the Nuclear Engineering Graduate Student Assembly is to serve as a collaborative forum that enables University of Tennessee graduate students in the Nuclear Engineering Department to initiate and engage in discussions, events, and programs hosted by the organization. In addition to giving graduate students a voice and agency, the NEGSA is dedicated to supporting graduate students through creating a

community for nuclear engineering graduate students to express their opinions, questions, and ideas for improving the department.

The NEGSA is open to all graduate students within the NE Department and typically meets once per month. Since its creation in 2019, the NEGSA has worked with the Department to create a formal way for students to request specific colloquium speakers, helped establish a NE graduate student orientation, helped revamp the graduate student recruitment process, and organized several community outreach events. The NEGSA also organizes periodic social events for graduate students to encourage the formation and sustainment of a department community.

The NEGSA is committed to working with the NE Department on the action items defined in the Pledge for Allyship, social justice, and outreach. Through participation with the department on their action items and establishing open and regular feedback channels, the NEGSA hopes to help in the pursuit of measurable progress in the support of members of our community who are consciously or unconsciously disadvantaged by policies and practices in the department, university, and nuclear industry.

4.3.2 Retention and Access Development (RAD) Committee

The focus of this committee of faculty, staff, and students is to monitor and improve efforts of our department related to student recruitment and retention, departmental climate and community, hiring, and research activities, always recognizing that there is value in sharing opportunities. The RAD Committee recommends actions, programming, and initiatives to the department and our constituent groups. Students, faculty, and staff are encouraged to participate in the RAD Committee. We value and appreciate the labor that is involved in service committees. Students interested in participating in the RAD Committee can contact Prof. Coble (jamie@utk.edu) to join the RAD Committee email list or join the Department Slack Workspace and the RAD Committee channel.

4.3.3 NE Department Slack Workspace

Professor Coble maintains an optional Nuclear Engineering Department Slack workspace. Students are encouraged to join the UTNE Slack workspace if interested, where they can find channels for departmental news and announcements, job opportunities, upcoming webinars/trainings, RAD communications, NEGSA, receive real-time help with research, etc. If students are interested in joining, please contact Professor Jamie Coble (jamie@utk.edu) for an invitation or visit < <https://utne.slack.com/>>.

4.3.4 University Ombudsperson

In addition to measures taken by the Department to support students, the University offers an Ombuds office to provide the University community with an informal channel of conflict resolution and allows faculty, staff, and graduate students to access an impartial and honest mediator for the resolution of problems. From the Office of Ombuds Services,

“The Office of Ombuds Services serves as an independent, impartial, confidential, and informal resource for UT Knoxville and UT Institute of Agriculture employees—both faculty and staff—as well as graduate students.” More information about the Ombudspeople can be found online from the Office of Ombuds Services, < <https://ombuds.utk.edu/> >. Students should be aware that the Ombuds can maintain confidentiality for any issue.

4.3.5 Mandatory Reporting and University Office of Title IX

Faculty and staff may not be able to maintain confidentiality in some instances when concerns are reported to them. Faculty and staff are usually mandatory reporters to the University Office of Title IX (see < <https://titleix.utk.edu/faculty-and-staff/mandatory-reporters/> >). In some cases, GRA or GTAs may also be mandatory reporters. If you have any questions about mandatory reporting or your status as a mandatory reporter, please reach out to the Office of Title IX (titleix@utk.edu).

4.3.6 Other University Resources

The University offers many resources for student support which are not specific to NE graduate students. Nevertheless, these resources can be helpful during a student’s graduate studies. As part of the commitment to students’ success, a list of university resources for student support can be found in Section 9 under “Student Resources.”

5. Registration, Advising and Degree Progression

Academic advising is provided by the student’s Major Professor; however, if a Major Professor has not been chosen, the Department Head or designee (e.g., the Associate Department Head / Director of Graduate Studies) will provide academic advising. The goal of first year course selection for Ph.D. seeking students is to set the student up to be successful in passing the Ph.D. qualification exam offered annually in May, which represents the first of two requirements to become a Ph.D. Candidate. Students without a NE undergraduate degree are usually advised to take NE 433 and NE 470 their first semester. A full course load is usually three graduate courses per semester; see section 6.1 for more information. Some 400-level courses listed in the Graduate Catalog in Nuclear Engineering may be used for graduate credit. However, for a MS degree, at least two-thirds of the minimum required credit hours in the MS must be taken in courses numbered 500 or above. Registration deadlines are provided in the Timetable/Financial Deadline Calendar on the Registrar website: < <http://registrar.utk.edu/calendar/> >. Note that many needed items are accessible through < <https://myutk.utk.edu> >, < <https://oit.utk.edu>>, or through use of a simple term such “utk academic calendar,” “utk graduate school forms,” or “utk graduation deadlines.”

5.1 Required Course Loads

Required course loads can be found in the Graduate Catalog; this information is repeated below for your convenience and some additional information is added in brackets:

The maximum load for a graduate student is 15 credit hours, and [during the academic year (fall and spring semesters that run August through April),] 9 to 12 credit hours are considered a full load. For the summer term [(May through July)], graduate students may register for a maximum of 12 credit hours in an entire summer term or for a maximum of 6 credit hours in a five-week summer session. Students may enroll in only one course during a mini-term session. [Many of our students elect research credits but not coursework during the summer.]

Students holding a one-half time assistantship normally should enroll for 6-11 credit hours. A one-fourth time graduate assistant normally should take 9-13 credit hours. A student on a one-half time assistantship [(20 hrs/wk)] who takes 6 credit hours will be considered full time for academic purposes. [This full-time status may very well be required for support by your grant or contract.] See heading "Financial Assistance" regarding financial aid eligibility for students with Assistantships. Refer to the Policy for the Administration of Graduate Assistantships for additional information. Students receiving financial aid [who are unaware of necessary course loads] should consult with the [Department Head or Director of Graduate Studies]. Courses audited do not count toward minimum graduate credit hours required for financial assistance.

Registration for more than 15 credit hours during any semester, or for more than 12 credit hours in the summer term, is not permissible without prior approval. The academic advisor [i.e. major 14 professor] may request registration of up to 18 credit hours during a semester if the student has achieved a cumulative grade point average of 3.6 or better in at least 9 credit hours of graduate work with no outstanding incompletes. No more than 12 credit hours are permissible in the summer term without prior approval.

In summary, most students on payroll having a 25% assistantship (10 hrs/wk) are required to take 9 hours per semester during the academic year (i.e., during Fall or Spring semesters). Most students on payroll having a 50% assistantship (20 hrs/wk) are required to take 6 hours per semester during the academic year. Students who are required to work 20 hours per week don't have to take as many courses.

If a student is not on payroll but instead receives an external source of financial aid (e.g., through fellowships such as NSF, NEUP, etc.), these students are required to take 9 hours per semester during the academic year. If a student has no support, they have to take 9 hours per semester to be full time.

There are also some separate requirements for reduced full time course loads for international students. It is the responsibility of the international student to work with the Center for Global Engagement (CGE), < <https://cge.utk.edu> >, to maintain their student visa status and comply with United States law.

5.1.1 Summer Registration Requirements

Summer registration requirements differ depending on the student's situation:

- If a student is on campus at all, they need to register for at least 3 hours of the following: a traditional class, NE 500, 502, 598, or 600.
- If a student is off campus, but working on research with some advising from a faculty, they need to register for some research hours: NE 500, 598, or 600.
- If a student has started doing Ph.D. research and has taken NE 600, they need to continue to take 3 hours each semester until graduation including summers, unless they have an approved Leave of Absence (LOA). See the grad school's < <https://gradschool.utk.edu/academics/forms-central/> >.
- If a student is graduating at the end of the summer with a thesis, they need to register for 3 hours of NE 500 or NE 600, as appropriate.
- International students may have different requirements; please contact CGE.
- Some students may have different requirements due to external fellowships.

5.1.2 Graduate Student Colloquium Registration Requirement

The Nuclear Engineering Department's Graduate Seminar (NE 501) is offered on Wednesdays from 1:30 to 2:30 pm followed by light refreshments with the speaker. These seminars are an important component of the graduate educational experience. First and second year graduate students are required to attend at least 75% of the seminars each semester. Nominally, 12 seminars are given each semester, so attendance is required for 9 or 10 of them. The seminars are normally webcast; however, attendance is normally expected in person. If a student is on official travel as evidenced by an approved travel form, or if they have a conflict that is confirmed by their advisor, they will receive credit for the missed seminar after watching the seminar video and providing a short summary (about 1 page) to their advisor prior to the next seminar. Students who are performing research for an extended period at a remote location will be required to make arrangements with their advisors to meet seminar requirements.

Seminar hours can be used toward coursework credit to meet graduation requirements. For MS students, a maximum of 3 hours may be applied to the major. For Ph.D. students with an MS, a maximum of 3 hours may be applied to the major.

There are attendance requirements for the NE 501 seminar course and for students with research at ORNL, Y-12, or another offsite location, your advisor can develop a plan for you to meet these attendance requirements through in-person attendance or through watching the seminars online and then writing a summary turned into the advisor. If you have any questions, please discuss them with your advisor. If you do not have an advisor and have questions, please feel free to contact the Director of Graduate Studies or the Co-Chairs of the Graduate Committee. There is a form that NEGSA uses to initiate a graduate student request for a seminar speaker.

5.1.3 Ph.D. NE 600 Research Credits

A student must pass the qualifier (see Section 6.2) before taking NE 600: Research. At least 24 credits of NE 600 are required for a Ph.D. degree, although more may be required in order to ensure that a Ph.D. Candidate has received credit for the 72 hours required for a Ph.D. degree. (Up to 24 hours of coursework credit from a MS may be used toward these requirements, if a student's committee agrees. Students having Ph.D. interest should not list more than the required MS coursework on their MS Candidacy form because only 24 coursework credits on the form can double count toward a Ph.D. degree) Once a student begins to take NE 600, they must continue to take at least 3 hours of NE 600 each semester, including summer. The one exception is if a student has an approved leave of absence (LOA). During the LOA, no work related to a student's thesis research should be conducted. A LOA form is available at the Graduate School website <http://gradschool.utk.edu/forms-central>. If personal emergencies or other extenuating circumstances arise causing a student to have to interrupt their studies, the student may file a Request for Leave of Absence (LOA) for a maximum of two years. The LOA may be granted by the Graduate School upon approval of the home department or program. Students who have been granted a leave of absence are eligible for reinstatement to active status and do not have to apply for readmission.

Ph.D. Students who do not maintain continuous enrollment will lose their active status and may not continue in their program until readmitted. Upon readmission, students will be responsible for payment for retroactive enrollment for the missed terms during which no LOA was granted.

5.2 Qualifying Exam, Ph.D. Proposal, and the Ph.D. Committee

Graduate students can expect to complete the exam in early January or August at the end of their first or second year of graduate studies; the appropriate timing of the first QE attempt should be determined in consultation with the Major Professor. A student who fails the QE must take and pass the examination the next time it is offered to remain in the Ph.D. program. Students who fail the QE twice will be dismissed from the program. Remediation options may be offered to students who partially pass the QE. Remediation options are at the discretion of the QE committee and department faculty. Graded exams and rubrics will not be returned to the students. Students without a Bachelor's degree in

nuclear engineering will complete NE 433 (Principles of Health Physics) and NE 470 (Nuclear Reactor Theory) for graduate credit as outlined in the UTK Graduate Catalog and the NE Graduate Student Handbook.

Students must apply or show their intent to qualify for the PhD program by meeting certain criteria listed below.

1. Successfully completed a minimum of 9 NE and 12 total credit hours. This is typically achieved by the end of the second semester of the first academic year. If students have not met the minimum number of credit hours, they will take additional coursework to meet the minimum number of credit hours.
2. Obtained a minimum, cumulative GPA of 3.5 in NE credits and in total credits.
 - a. Students applying directly from a Bachelor's degree must demonstrate a cumulative GPA of 3.5 in at least nine NE graduate credits as well as in their total graduate credits.
 - b. Students applying from a Master's degree – either from UTK or another institution - must demonstrate a cumulative GPA of 3.5 in at least nine NE graduate credits (from UTK or another institution) as well as in their total graduate credits.
 - c. If a student does not have a minimum NE and/or total GPA of 3.5 at the desired term for qualification, the student can take additional classes in effort to increase the GPA. The student's Faculty Advisor can make a recommendation to the Graduate Committee to review on a case-by-case basis and pass along a recommendation to the Director of Graduate Studies.
3. Students are allowed a maximum of two attempts at the QE. Students enrolled in the PhD program should make a first attempt at the QE no later than the completion of their second academic year as a PhD student. In most cases, PhD students will make their first attempt following completion of their second semester. For example, if PhD students start in August, they should make a first attempt at the QE the following August (one calendar year). If a second attempt is warranted, the student should plan to try again the next time that the QE is offered (either January or August). If students do not successfully pass the QE after their second attempt, they will consult with their Faculty Advisor for an alternate academic plan.

The process of the PhD Qualifying Exam is outlined below: An example oral qualifying exam rubric is included in Appendix 9.3.

1. Students will select which of the subject matter topics is best suited for their field of research by the end of the first week of February, following receipt of a QE exam memo from the NE department during the first week of Spring semester classes.

2. Based on the subject matter topics, and the number of students per topic for QE part 2, the Department Head and Graduate Program Committee will select the 3-member Qualifying Exam committee for each subject matter topic (by middle of February).
3. The QE committee for each subject matter topic will identify 3 journal articles for the literature review by 1 March.
4. Each student will select one of the three journal paper options for their literature review by the end of Spring Break. Students must advise the QE coordinator of their article selection by the end of Spring Break. The student will perform a critical literature review of their selected journal article within the selected Research Topic and answer questions. The student should discuss their topic area of choice with their Major Professor who will approve, or deny, the topic selection. But faculty are encouraged not to do a dry-run of the presentation with their students.
5. The Oral Qualifying Exam should be between 30 to 45 minutes in length and administered by the appropriate three-member QE topical committee.
6. Exam format:
 - a. The student will prepare a written document that summarizes their review of the selected article, which demonstrates understanding of fundamental principles, theory, and command of the topic at hand. The written document should be approximately 7 pages (but can range from 5-10 pages) plus additional pages for references.
 - b. The written document will be submitted to the committee one week before the oral QE, with the QE coordinator on copy.
 - c. The student will prepare and present a literature review that demonstrates an active exploration of a topic or concept provided in the rubric on the topic of their choice. The presentation should be between 15-20 minutes in length, including probing questions from the committee, and may include PowerPoint (or similar) visual aide slides. Following the presentation, the student can be asked probing questions associated with the journal article review and proposed next step research.
 - d. Subsequently, the Exam committee will ask additional questions (up to the 45-minute total time allotted for the exam) on fundamental topics to demonstrate knowledge in that research subject matter.
7. After completion of all oral QEs, a faculty meeting will be held to discuss the results and agree on each student's performance (pass, fail, partial fail), and the recommended actions for remediation in the event of a fail or partial fail of the QE. Students are advised of their pass/fail/partial fail result after this faculty meeting occurs, following all QE presentations.

Subject Matter Topics

- Transport processes in nuclear engineering (including shielding and neutral particle radiation transport)
- Nuclear system dynamics & control (including instrumentation)
- Radiological engineering
- Nuclear reactor theory, safety and design
- Nuclear fuels and materials
- Nuclear security and radiation detection
- Nuclear fusion
- Radiochemistry

The oral qualification exam is offered twice per year in January and August. A memo is provided to graduate students in the first week of the Spring semester. To reiterate, registration for NE 600 research credit is not permitted until both parts of the qualifying examination are passed. (However, students may take NE 6XX coursework before passing this exam.)

A student's Ph.D. committee is created using the appropriate form at the aforementioned graduate school forms website. A student should consult their advisor regarding the constitution of the Ph.D. committee; they must then ask the permission of each member they would like to serve on this committee, referring them each to the Major Professor for any additional information required. The committee form must be signed by the Department Head. For any committee members external to the University, a curriculum vitae (CV) for this member must be submitted to the Department Head and the graduate school <gradschool@utk.edu>. (Students seeking to form MS committee should speak with their Major Professors to ensure its members are in keeping with the more stringent requirements of the University.)

The comprehensive examination is completed with the successful oral defense of a written dissertation proposal to one's Ph.D. committee. This exam is also called a proposal defense. The written proposal should be submitted to a student's committee two weeks before the oral defense. If the proposal is not submitted one week in advance, the student must obtain permission from each committee member to proceed with the planned defense. The proposal should contain the following sections:

- Introduction and background including a review of relevant work,
- List of original contributions (usually about half a page)
- Description of research work to date
- Description and schedule of remaining work
- List of references that are appropriately cited

Students should speak with their Major Professor for additional details and requirements about what is expected.

For the purpose of Ph.D. Candidacy paperwork (see the graduate school forms website), the comprehensive exam is considered complete on the day a student passes this exam. Only after a successful proposal defense should a student submit their Ph.D. Candidacy paperwork to the Director of Graduate Studies in order to become a Ph.D. Candidate.

A student should aim to complete their proposal defense as soon as possible, but certainly more than a year before completing their dissertation work such that the guidance of the committee may impact the trajectory of the student's research. We recommend a Ph.D. proposal 2-3 years after starting graduate school.

6 Degree Requirements

The Nuclear Engineering Department offers the following graduate degrees and certificates:

- Dual MS-MBA Program – Nuclear Engineering
- Nuclear Criticality Safety Graduate Certificate
- Nuclear Engineering Major, MS
- Nuclear Engineering Major, Ph.D.
- Nuclear Security Science and Analysis Graduate Certificate
- Reliability and Maintainability Engineering Graduate Certificate – Nuclear Engineering Concentration
- Reliability and Maintainability Engineering, MS – Nuclear Engineering Concentration
- Medical Physics, MS
- Medical Physics Graduate Certificate

Specific requirements can be found in the aforementioned Graduate Catalog. Graduate students will always graduate under the most recent graduate catalog.

6.1 Nuclear Engineering Major, Ph.D.

In the descriptions below, note that there are two types of credit hours: graduate coursework (not NE 600) and research credits (NE 600).

6.1.1 Ph.D. Requirements

Students in the field of nuclear engineering desiring to pursue the Doctor of Philosophy degree must have a Bachelor of Science or Master of Science from a recognized university with a major in engineering, physics, chemistry, or mathematics. Specific requirements for the Ph.D. with a major in nuclear engineering include the following:

- A minimum of 72 credit hours beyond the bachelor's degree, exclusive of credit for the MS thesis. Of this number, a minimum of 24 credit hours in NE 600 and a minimum of 39 hours of graduate coursework will be required.
- The graduate coursework requirement includes a minimum of 24 credit hours of graduate courses in nuclear engineering at or above the 500-level, exclusive of thesis, practice project, or dissertation credit.
- Three credits (1+1+1) of NE 501 Graduate Seminar are required as part of the 24 hours of graduate coursework in nuclear engineering.
- A minimum of 12 additional coursework credit hours is required, subject to approval by the student's Ph.D. committee.
- At least 6 credit hours of the above coursework must be at the 600-level, with at least 3 of these credit hours in nuclear engineering.
- At the discretion of the student's dissertation committee and depending on the student's background, more than 39 credit hours of courses may be required.
- A maximum of 24 credit hours from a master's degree may be used to satisfy the course requirements for the Ph.D.

6.1.2 Ph.D. Process and Forms

The forms required to complete the Ph.D. process are detailed below. Be sure to consult with your faculty advisor as needed and be aware of deadlines listed at the aforementioned graduate school deadlines site.

1. Work with your Major Professor to select a committee and fill out the Ph.D. Committee form: <<https://gradschool.utk.edu/forms-central/phd-committee-form/>>. The revised committee form is useful too if you ever need to change your committee for whatever reason or if you have more than 4 committee members: <<https://gradschool.utk.edu/forms-central/revise-phd-committee-form/>> . CVs are required for committee members that are external to the University of Tennessee. This form gets submitted to the Department Head who will sign and submit it to the Graduate School.
2. Once your Major Professor thinks you and your written proposal are ready, schedule your dissertation proposal; no forms are needed for this step!
3. Complete the Admission to Candidacy form and have your Major Professor review it prior to the day of your proposal defense. Take the Admission to Candidacy form to your proposal defense. Have the committee sign it if you pass: <<https://gradschool.utk.edu/forms-central/admission-to-candidacy-doctoral-degree/>> . The day you complete the comprehensive exam is the date of your successful proposal defense. The Director of Graduate Studies will review your form and submit it to the Graduate School once it is fully signed. Common mistakes on the Admission to Candidacy form include:

- Listing the wrong date for completing the comprehensive exam, which isn't done until the Ph.D. proposal defense is passed.
 - Listing NE 500, NE 502, and NE 598 credits, which don't count toward a Ph.D. degree.
 - Not listing enough NE 600 research credits to obtain an overall total of 72 credits for the Ph.D. degree.
 - Not fulfilling the course requirements (e.g. the number of NE courses).
4. As you work on writing your dissertation while your Major Professor reviews chapters, submit a draft of it to the dissertation consultant for formatting requirement suggestions. Pay attention to any other communications from the Graduate School about your graduation. Prior to distributing it to the committee (2 weeks in advance of defense date), the dissertation should be given to, and approved by, your Major Professor, so you should provide it to them ~4 weeks prior to the defense date.
 5. Take the Dissertation Approval and Report of Final Examination/Dissertation Defense forms to your dissertation defense. Have the committee sign the approval form if you pass: < <https://gradschool.utk.edu/academics/forms-central/thesis-dissertation-approval/> >.
 6. The report of Final Examination/Dissertation Defense form is here: <<https://gradschool.utk.edu/forms-central/report-of-final-exam-dissertation-defense/>>. Your committee members will sign it after you have completed the dissertation edits that they require.
 7. After the dissertation has been finalized, submit it to the dissertation consultant for final review and approval by the University.
 8. Graduate! If you would like your Major Professor to attend your hooding ceremony, make sure to communicate about this event. (Your cap, gown, and hood must be ordered in sufficient time.)

6.2 Nuclear Engineering Major

6.2.1 MS Requirements

The Department of Nuclear Engineering offers a Master of Science degree in Nuclear Engineering, which can provide additional exposure to a nuclear engineering subfield, such as traditional fission energy, nuclear security, nuclear materials, nuclear fusion, or radiation protection. Students may elect to complete a concentration in Nuclear Safety or Radiological Engineering. These concentrations are described in the Graduate Catalog and in Sections 6.6.6 and 6.6.7 of this handbook.

The MS program requires a minimum of 24 hours of coursework, as well as a research option totaling 30 hours overall. The research option and specific coursework should be selected by the student in coordination with the student's graduate committee and is based on the student's personal interests, academic background, and work experience, as well as the nature of projects currently available in the department. A thesis requires the student to conduct independent, in-depth research. An engineering practice project is similar to a thesis project but smaller in scope and can be research, design, product development, special operations, or a critical review of published literature in a specific technical area. The final report for an engineering practice project is normally prepared in thesis format; however, another formal report format may be used if approved by the student's graduate committee.

The program requires 15 credit hours of graduate courses across the breadth of Nuclear Engineering (courses coded NE). A minimum of 2 credit hours of NE 501 are required, and a maximum of 3 credit hours of NE 501 can be used. An additional 9 credit hours of graduate courses are required; these courses should be related to the student's research, as approved by the student's committee, and are typically selected from Nuclear Engineering, Physics, Mathematics, Computer Science, Mechanical Engineering, Material Science and Engineering, or other STEM fields. Students without a BS in nuclear engineering, or the equivalent, must take NE 433 and NE 470, both of which may be taken for graduate credit. A maximum of 9 credit hours of 400-level courses (taken for graduate credit) can be applied toward the MS coursework requirements.

In addition to the minimum 24 hours of coursework, students are also required to complete one of three research options:

Option 1 – a thesis project (6 credit hours of NE 500)

Option 2 – two engineering practice projects (6 credit hours of NE 598)

Option 3 – one engineering practice project (3 credit hours of NE 598) plus 3 credit hours of additional nuclear engineering coursework

Students must pass an oral examination on all work presented for the degree (all coursework and research findings). All selections related to coursework and research options should be made in consultation with the student's research advisor and committee.

6.2.2 MS Process and Forms

The forms required to complete the MS process are detailed below. Be sure to consult with your Major Professor as needed:

1. MS degree seeking students should confer with their Major Professors in order to form a MS committee that meets the stringent requirements of the Graduate School. (The committee members should be UTK faculty members that are on an existing graduate school list.) MS committee members may be tenure/tenure track,

research faculty, joint faculty, or adjunct faculty. A 4th MS committee member inside or outside the university is allowed, as long as the department is OK with them having the 4th committee member. They must have a minimum of 3 faculty from UT Knoxville on the form. The Department must approve an outside member using their latest CV.

2. The Admission to Candidacy form must be submitted by the last day of classes the semester before you intend to graduate. This includes selecting your committee and listing classes. This form is located here: <<https://gradschool.utk.edu/forms-central/admission-to-candidacy-masters-or-specialist-degree/>>. If you need to change your committee, use the Revised Admission to Candidacy form. The Director of Graduate Studies (Dr. Wirth, bdwirth@utk.edu) is the last person to sign the form, and it may be submitted by the Major Professor or the Director of Graduate Studies.
3. Submit your thesis for format review by the review deadline for the semester you intend to graduate.
4. The thesis defense or practice project should be scheduled for a time after the Admission to Candidacy form has been submitted.
5. During your defense, bring the Report of Final Examination form. This is what will be submitted by your Major Professor or the Director of Graduate Studies to the Graduate School to record a pass/fail of the defense. This does not finalize your thesis. See: <<https://gradschool.utk.edu/academics/forms-central/report-of-final-examination-defense-of-thesis-project-capstone-masters-or-specialist-degree/>>
6. After the thesis has been finalized, submit your thesis to the dissertation consultant for final review and approval by the University. The Thesis Approval Form is submitted by your Major Professor or the Director of Graduate Studies indicating your committee's acceptance of your written document.
7. Graduate! If you intend to participate in the Graduate Hooding Ceremony, RSVP and order your cap and gown with sufficient time to receive it.

6.2.3 Concurrent Master's Degree Program

Currently enrolled UT doctoral students who plan to complete the master's degree while maintaining enrollment in the doctoral program must submit a Request for Concurrent Master's Degree form to the Graduate School graduation office two weeks prior to the deadline for submission of the graduation application for the Master's Degree. No fee will be assessed for submission of this form.

For students receiving financial support from the Department, if your main interest is in receiving the terminal degree for our graduate program, a Ph.D. degree, we advise that you enroll as a Ph.D. student and, if interested in a MS degree along the way, request a concurrent Master's Degree. Obtaining a MS degree along the way is a good idea in case either you or the Department decides that a Ph.D. degree at UTK is not in your best interest. You should plan to meet the requirements to obtain a MS degree within 18 to 24 months. If

a student is enrolled in the BS-MS program at the University of Tennessee, it may be possible to obtain the MS degree within 12 months.

6.2.4 MS Defense Combined Ph.D. Proposal Option

In particular, if a Ph.D. seeking student in NE utilized the concurrent option to get an MS in NE as the student progressed towards the Ph.D., they may combine the MS practice project defense with their Ph.D. proposal defense. Specifically, if a student:

- Desires to obtain a concurrent MS degree in Nuclear Engineering
- Elects one of the practice-project-based options to obtain this MS degree
- Is conducting MS and Ph.D. research in the same topical area
- Includes three members of the NE department in their Ph.D. committee, and
- Has the consent of their Major Professor, then the student may elect to incorporate their MS defense into their Ph.D. proposal defense.

In particular, the “Contributions to date” section (see Section 6.2) of the Ph.D. proposal defense will double as the MS defense. The Ph.D.-seeking student must still follow the guidelines of a standard Ph.D. proposal defense in the NE department, incorporating the following sections into both the written proposals and oral defenses:

1. Introduction and background, including a review of prior relevant work
2. Statement of original scientific contributions
3. Contributions to date
4. Remaining tasks and expected schedule for completion
5. References

Separate decisions will be made by the committee as to the outcome of this defense for MS degree conferral and Ph.D. Candidacy. Naturally, any committee member who is only on the Ph.D. committee (and not the MS committee) only weighs in on the Ph.D. Candidacy, and vice versa, if applicable.

6.2.5 Five-Year BS-MS Program, Nuclear Engineering Major

The Department offers a 5-year BS-MS program with a BS (major in nuclear engineering) and an MS (major in nuclear engineering) for qualified students. The primary component of the program is that a qualified student may take up to 6 credit hours of 24 approved graduate courses for their senior undergraduate electives and have them count toward both the Bachelor's and Master's degrees at the University of Tennessee. This program is designed for students attending the University of Tennessee for their Master of Science degree, because other universities may not accept these courses for graduate credit since they were used to satisfy requirements for the Bachelor of Science degree. Significant components of the program are:

- Students must have an overall GPA of 3.4 in required coursework. Conditional admission to the 5-year program may be granted after completion of 63 credit hours of required coursework, while full admission may be granted after the completion of 93 credit hours of required coursework with a minimum GPA of 3.4.
- Admission must be approved by the Department and the Graduate School.
- Students must at least be conditionally admitted to the program prior to taking courses that receive credit for both the BS and MS degrees.
- All courses taken for graduate credit must be approved by the Director of Graduate Studies. Students admitted to the program must request permission from the Graduate School to take approved courses for graduate credit. Students admitted to the program must also follow the normal procedure for admission to the Graduate School.
- Students will not be eligible for graduate assistantships until they are enrolled as graduate-level students in the Graduate School. (Graduate assistantships are reserved for Ph.D.-seeking students first.)

6.3 Medical Physics Major, MS

The CAMPEP accredited MS in Medical Physics program is designed for graduates of accredited undergraduate programs in engineering, physics, or a closely related field who would like to become certified Medical Physicists and/or conduct research in Medical Physics. Students that desire a more in-depth research experience may want to pursue the MS in Medical Physics on their way towards a Ph.D. in Nuclear Engineering.

A major consisting of 20 credit hours of graduate courses in engineering which must include each of the following core courses: BME 574, NE 490, NE 551, NE 565, NE 566, NE 567, NE 568, and NE 569. An additional 2 graduate courses from the following list of electives: NE 406, NE 542, NE 550, NE 552, NE 582, NE 583, or NE 588. Two foundational courses: BCMB 230 (5 credit hours), EEB 250 (3 credit hours), and EEB 251 (1 credit). Please see the current undergraduate catalog for course descriptions. NOTE: These courses cannot be taken for graduate credit.

Option Requirements

- Thesis Option: NE 500 Thesis, 6 credit hours
- Project Options (NOTE: Research topic must be related to Medical Physics): Two engineering practice projects, NE 598 for 6 credit hours; One engineering practice project, NE 598 for 3 credit hours, plus 3 credit hours of additional nuclear engineering (NE) coursework as approved by the student's graduate committee.

Medical Physics MS Showcase Curriculum

<u>Term 1 (Fall)</u>	<u>Hours</u>
NE 490 Radiation Biology	3
NE 551 Radiation Protection	3

NE 567 Medical Physics I	3
<u>NE 565 Medical Physics I Clinic</u>	<u>1</u>
	=10

Term 2 (Spring)

NE 568 Medical Physics II	3
NE 566 Medical Physics II Clinic	1
NE XXX* Technical Elective	3
<u>EEB 250,251 Human Anatomy</u>	<u>4 (UG)</u>
	=7

Term 3 (Summer)

NE 569 Medical Physics Clinical Experience	3
<u>NE 584 Nuclear Engineering Practice</u>	<u>3</u>
	=6

Term 4 (Fall)

BME 574 Medical Imaging	3
BCMB 230 Human Physiology	5 (UG)
NE XXX* Technical Elective	3
<u>NE 584 Nuclear Engineering Practice</u>	<u>3</u>
	=9

Total Graduate Hours 32

Non-course Requirements:

- The Medical Physics Program Director (Dr. Michael Howard, <mhowar14@vols.utk.edu>) must be a member of all MS graduate committees.
- The determination of which option a student may undertake is made by the student's graduate committee and is based on the student's personal interests, academic background, and work experience, as well as the nature of projects currently available in the department.
- A thesis project requires the student to conduct independent, in-depth research on a Medical Physics related topic.
- An engineering practice project is similar to a thesis project but smaller in scope and can be research, design, product development, special operations, or a critical review of published literature in a specific technical area related to Medical Physics.
- The final report for an engineering practice project is normally prepared in thesis format (i.e., according to the Graduate School, Guide to the Preparation of Theses and Dissertations); however, another formal report format may be used if approved by the student's graduate committee.
- The student must also register for the appropriate number of credit hours of either NE 500 or NE 598, as specified by the student's major professor, during each semester that work is performed on a thesis or engineering practice project.

- Finally, the student must pass an oral examination on all work presented for the degree regardless of thesis or project (all course work and all projects).

6.4 Dual MS-MBA Program – Nuclear Engineering

The Nuclear Engineering Department offers a Dual MS-MBA Program. The program requirements are provided in the Graduate Catalog: < <https://catalog.utk.edu/index.php>>.

6.5 Reliability and Maintainability Engineering, MS – Nuclear Engineering Concentration

A Master of Science degree with a Major in Reliability and Maintainability Engineering is offered through an interdepartmental program. Both thesis and non-thesis options are available. See the Catalog listings for the appropriate department in the Tickle College of Engineering and the Department of Business Analytics and Statistics for more information about the courses offered. The program can be completed on campus or through distance delivery. The Reliability and Maintainability Engineering Program Director, Dr. Bing Yao, is the contact for all students interested in the concentration, <<https://tickle.utk.edu/rme/>>. The requirements are found in the Graduate Catalog: <https://catalog.utk.edu/preview_program/php?catoid+55&poid+35206>.

6.6 Graduate Certificates and Concentrations

Several graduate certificates are offered by the Nuclear Engineering Department to provide specific education in specialized areas. Most certificates require 4 courses (12 credit hours). Students must maintain a minimum of a 3.0 grade point average once in the program and complete the requirements of the certificate program as stated in the Graduate Catalog to be awarded the graduate certificate.

For all graduate certificates where another graduate degree is being pursued at the University as well, students should apply for an add-on certificate prior to the completion of six-semester hours towards the certificate requirements. The required form is available at: < <https://gradschool.utk.edu/academics/forms-central/admission-to-a-graduate-certificate-program/>>. More information is available at: <<https://catalog.utk.edu/content.php?catoid+55&navoid=11835>>.

It is important to note that any certificate added onto a degree requires an extra certificate course to be taken that does not count for degree credit. The form that shows this requirement is available here: <<https://gradschool.utk.edu/academics/forms-central/graduate-%20certificate-course-verification/>>. There is no such requirement for a concentration.

6.6.1 Medical Physics Graduate Certificate

The Department of Nuclear Engineering offers a CAMPEP accredited Graduate Certificate in Medical Physics (MP). The Graduate Certificate in Medical Physics is

designed for students who have earned a Ph.D. in a related field and who would like to become certified Medical Physicists and/or conduct research in Medical Physics.

Students can potentially transfer in a very limited number of courses if they are found to cover equivalent topics of the required courses. More information can be obtained by contacting the Medical Physics Program Director (Dr. Michael Howard).

All entering students shall have a strong foundation in basic physics demonstrated either by an undergraduate or graduate degree in physics, or by a degree in an engineering discipline or another of the physical sciences and with coursework that is the equivalent of a minor in physics (i.e., one that includes at least three upper-level undergraduate physics courses that would be required for a physics major.)

The 15-graduate credit hour certificate is earned by completing the five required courses listed below and the two undergraduate courses

<u>Required Courses</u>	<u>Credit Hours</u>
BME 574 Medical Imaging	3
NE 490 Radiation Biology	3
NE 551 Radiation Protection	3
NE 567 Medical Physics I	3
NE 568 Medical Physics II	3
BCMB 230 Human Physiology	5 (UG)
EEB 250,251 Human Anatomy	4 (UG)

The Medical Physics Program Director must be a member of all Ph.D. graduate committees for students that intend to receive a Graduate Certificate in Medical Physics as an Add-on Option. The Medical Physics Program Director will help to make the program acceptance decision.

6.6.2 Nuclear Security Science and Analysis Graduate Certificate

The Department of Nuclear Engineering offers a graduate certificate in Nuclear Security Science and Analysis (NSSA). The program is designed primarily for students seeking specialization in nuclear security science with emphasis on current or aspiring members of the nuclear security community, including those areas with an emphasis on arms control, treaty verification, non-proliferation, international nuclear security issues in both civilian and military contexts, nuclear threat detection, and principles of nuclear intelligence assessment. Additionally, this program will prepare graduate students to engage in the research and development of new tools and processes related to nuclear security science and analysis.

The 12-credit hour certificate is earned by completing four courses from the following lists, including one required course, one qualifying Nuclear Engineering elective course, and two NSSA electives.

- The required course is NE 530 - Nuclear Security Science and Analysis.

- Qualifying Nuclear Engineering elective courses include (please note that the 400-level courses must be taken for graduate credit to qualify for the certificate):
 - NE 404 - Nuclear Fuel Cycle,
 - NE 433 - Principles of Health Physics,
 - NE 470 - Nuclear Reactor Theory,
 - NE 542 - Management of Radioactive Materials,
 - NE 551 - Radiation Protection,
 - NE 571 - Reactor Theory and Design.
- NSSA electives include:
 - NE 532 - Detection, Localization, and Nondestructive Assay of Nuclear and Radiological Materials,
 - NE 533 - Physical Security for High-Consequence Facilities,
 - NE 534 - Physical Security Vulnerability Assessment,
 - NE 537 - Human Reliability in Nuclear Systems
 - NE 550 - Radiation Measurements Laboratory,
 - NE 635 - Nuclear Forensics,
 - POLS 686 - Arms Control, Deterrence and Nuclear Nonproliferation.

The selection of courses is determined through a student advising conference that considers the student's personal interests, academic background, and work experience. Criteria for acceptance to the certificate program are the same as for acceptance into the M.S. program in nuclear engineering. Students interested in the certificate are encouraged to contact Dr. Jason Hayward (jhayward@utk.edu) with any questions. He will also be the one to sign certificates after completion.

6.6.3 Reliability and Maintainability Engineering Graduate Certificate – Nuclear Engineering Concentration

The Tickle College of Engineering offers a graduate certificate in Reliability and Maintainability Engineering. The program is designed primarily for part-time students in that all of the courses are available through distance education. For more information about the RME programs, please call us at 865-974-0234 or contact the RME Program Director, Dr. Bing Yao, by email at byao3@utk.edu.

The 12-credit hour certificate is earned by completing CBE 483, IE 483, ME 483, or NE 483 and CBE 484, IE 484, MSE 484, ME 484, or NE 484, plus two elective courses selected from a list of courses provided by the participating departments – Chemical and Biomolecular Engineering; Electrical Engineering and Computer Science; Industrial and Systems Engineering; Mechanical, Aerospace, and Biomedical Engineering; and Nuclear Engineering.

Currently, the available elective courses are CBE 585 / NE 585, ECE 504, IE 516, IE 517, IE 522, ME 534, MSE 421, NE 441, NE 575, NE 579, NE 585, and STAT 567. The selection of elective courses is determined through an advising conference with each

individual student, and is based on the student's personal interests, academic background, and work experience.

6.6.4 Energy Science and Engineering Concentration

This concentration is offered in collaboration with the Bredesen Center for Interdisciplinary Research and Graduate Education. The Bredesen Center unites extensive and complementary resources at UT and Oak Ridge National Laboratory (ORNL) to advance science, technology, engineering, and mathematics research related to energy.

Students who wish to pursue this concentration will normally have completed 6 Core Credit hours, 3 credit hours of Knowledge Breadth, and 6 credit hours of Knowledge Specialization coursework (minimum 15 hours) specified under the Energy Science and Engineering (ESE) major, (Ph.D.) program in the Graduate Catalog.

Students in this program take a different qualification exam, as described on the Bredesen Center website <<https://bredesencenter.utk.edu>>. The director of the Energy Science and Engineering Concentration is Dr. Zhili Zhang (zzhang24@utk.edu).

6.6.5 Radiation instrumentation Interdisciplinary Graduate Education

The Radiation Instrumentation interDisciplinary Graduate Education (RIDGE) program began in the 2015-2016 academic year in order to establish a closer connection between engineering departments that contribute to radiation instrumentation systems research and development. The program is geared toward education of Ph.D.- seeking students through coursework and research. Though this program a student may earn either a MS degree in Nuclear Engineering, Computer Engineering, Computer Science, Electrical Engineering, or Materials Science Engineering along the way to the Nuclear Engineering Ph.D. It is also possible to earn another certificate along the way, such as one in Nuclear Security Science and Analysis. A sample curriculum along with other suggested milestones for a student seeking a Ph.D. in Nuclear Engineering can be found at: <<http://radideas.utk.edu>>. For more information about this program, please contact Dr. Jason Hayward.

6.6.6 Graduate Concentration in Nuclear Safety

This concentration requires classes be taken as part of the MS or Ph.D.

Required (3 courses):

- NE 421 Introduction to Nuclear Criticality Safety
- NE 585 Process System Reliability and Safety
- NE 586 NRC Licensing and DOE Standards

Two electives from the list below:

- NE 483 Introduction to Reliability Engineering
- NE 542 Management of Radioactive Materials
- NE 543 Selected Topics in Nuclear Criticality Safety
- NE 573 Nuclear Reactor Kinetics and Dynamics to Support Safety

- NE 582 Monte Carlo Analysis 30

6.6.7 Graduate Concentration in Radiological Engineering

This concentration requires classes be taken as part of the MS or Ph.D.

Required Courses (3):

- NE 490 Radiation Biology
- NE 551 Radiation Protection
- NE 552 Radiological Assessment and Dosimetry

Two elective courses from the list below:

- NE 512 Space Radiation
- NE 542 Management of Nuclear Materials
- NE 550 Radiation Measurements Laboratory
- NE 567 Medical Physics I
- NE 568 Medical Physics II
- NE 582 Monte Carlo Analysis

6.7 Committee Requirements

6.7.1 Master's Committee

A committee composed of the Major Professor and at least two other University faculty members, all at the rank of Assistant Professor or above, should be formed as early as possible in a student's program, and must be formed by the time a student applies for admission to candidacy (refer to Advisor/Major Professor). The responsibility of this committee is to assist the student in planning a program of study and carrying out research, and to assure fulfillment of the degree requirements. If the student has a minor, one member of the committee must be from the minor department.

6.7.2 Doctoral Committee

The Major Professor directs the student's dissertation research and chairs the dissertation committee. The student and the major professor identify a doctoral committee composed of at least four members. At least 2 committee members must be UT tenured or tenure-track faculty members. At least one committee member must be from outside of the student's department/interdisciplinary program. This external member can be from outside UT. UT tenured or tenure-track faculty without a doctoral degree and other experts in the field may serve on Ph.D. committees with department head approval. Students are encouraged where appropriate to seek a fifth member in the field of specialization from outside the University to serve on their dissertation committee. To officially establish the committee, the student will submit the Doctoral Committee Appointment Form with original signatures, as described in more detail above.

A doctoral student should begin to form the committee during the first year of study. Subject to Graduate Council policies and individual program requirements, the committee

must approve all coursework applied toward the degree, certify the student's mastery of the major field and any cognate fields, assist the student in conducting research, and recommend the dissertation for approval and acceptance by the Graduate School.

The doctoral committee is convened for the second part of the comprehensive exam or proposal defense and then again for the dissertation defense. A student should submit their dissertation at least two weeks ahead of the defense. If a student has not submitted their dissertation within one week of their defense, the student needs the permission of all committee members to proceed. The submitted dissertation should be a near final form, having already been reviewed by the Major Professor at this point. This also means that the student should check with the Graduate School to make sure it meets their formatting requirements. If any copyrighted materials are included in the dissertation (e.g., from journals), permission for publication should be obtained. If the dissertation needs to be approved for release by a sponsor, a national laboratory, or perhaps due to any nondisclosure agreements in place with a private company, this should also have been done.

If a student passes their oral dissertation defense, changes or editing of the dissertation may still be required by the committee. These changes must be completed before the deadline given by the Graduate School (see the Graduate School website for deadline information) in order for the Ph.D. degree to be conferred on time.

Another possible outcome of the oral defense is for the student to fail it. In this case, a student may reschedule a defense as soon as the following semester. Failure to pass the examination or to gain acceptance of a dissertation on the second try will result in dismissal from the Nuclear Engineering Ph.D. program.

6.8 Time Limits for Completion of Degree

MS Candidates have six calendar years to complete the degree, starting at the beginning of the semester of the first course counted toward the degree. Students who change degree programs during this six-year period may be granted an extension after review and approval by the Dean of the Graduate School. In any event, courses used toward a Master's degree must have been taken within six calendar years of graduation. The term(s) and/or year(s) of an approved Leave of Absence (LOA) will not be counted toward time to degree, and milestone deadlines such as Admission to Candidacy will be adjusted accordingly.

For Ph.D. students, the comprehensive examination must be completed within five years, and all requirements must be completed within eight years, from the time of a student's first enrollment in a doctoral degree program. The term(s) and/or year(s) of an approved Leave of Absence (LOA) will not be counted toward time to degree, and milestone deadlines such as Admission to Candidacy will be adjusted accordingly.

6.9 Ph.D. Residence Requirement

Residence is defined as full-time registration for a given semester on the campus where the program is located. The summer term is included in this period. During residence, it is expected that the student will be engaged in full-time, on-campus study toward a graduate degree.

For the doctoral degree, a minimum of two consecutive semesters of residence is required, except in programs where alternative or additional residence requirements have been approved.

A statement as to how and during what period of time the residence requirement has been met will be presented with the Application for Admission to Candidacy along with signatures of approval from the Major Professor and the department head/program director.

7.0 Academic Standards and Academic Standing

Graduate education requires continuous evaluation of the student. This includes not only periodic objective evaluation, such as the cumulative grade point average, performance on comprehensive examinations, and acceptance of the thesis or dissertation, but also judgments by the faculty of the student's progress and potential. Continuation in a program is determined by consideration of all these elements by the faculty and the head of the academic unit.

The academic records of all graduate students are reviewed at the end of each semester, including the summer term, to determine academic standing. For good standing, graduate students must maintain a cumulative grade point average (GPA) of at least 3.0 on all graduate courses taken for a letter grade of A-F. Grades of S/NC, P/NP, and I, which have no numerical equivalent, are excluded from this computation. There are three types of academic standing set at the end of every term of enrollment: good standing, academic probation, and academic dismissal.

7.1 Academic Probation

Upon completion of 9 credit hours of graduate coursework, a graduate student will be placed on academic probation when their cumulative GPA falls below 3.0. A student will be allowed to continue graduate study in subsequent semesters if each semester's grade point average is 3.0 or greater. Upon achieving a cumulative GPA of 3.0, the student will be removed from probationary status.

If a student is on academic probation, the degree or non-degree status will be terminated by the Dean of the Graduate School if the student's semester GPA falls below 3.00 at the end of the next semester while on probation. When the particular circumstances are deemed to justify continuation, and upon recommendation of the

appropriate academic unit and approval of the Dean of the Graduate School, a student on probation whose semester GPA is below 3.00 may be allowed to continue on a semester-by-semester basis.

If you are struggling academically, please reach out to your Major Professor, the Director of Graduate Studies, or the Department Head for help.

7.2 Academic Dismissal

If a student is on academic probation, the degree or non-degree status will be terminated by the Dean of the Graduate School if the student's semester GPA falls below 3.0 in a subsequent semester. When the particular circumstances are deemed to justify continuation, and upon recommendation of the appropriate academic unit and approval of the Dean of the Graduate School, a student on probation whose semester GPA is below 3.0 may be allowed to continue on a semester-by-semester basis.

Dismissal of a graduate student by a department or program is accomplished by written notice to the student, with a copy to the Graduate School. In those cases, where the department's requirements for continuation are more stringent than university requirements for graduate programs, the Dean of the Graduate School will evaluate the student's record to determine whether the student is eligible to apply for a change of status and register in another area of study. Registration for courses in a department from which a student has been dismissed will not be permitted, except by written authorization from that department.

7.3 Academic Dishonesty and Student Conduct

Dishonesty and other integrity issues are taken extremely seriously in the Nuclear Engineering Department as they are in the nuclear engineering industry. One falsified document could result in an accident or event that could change the course of nuclear power for the world. Our department will institute the harshest penalty allowed by the University when dishonesty, cheating, plagiarism, or other integrity issues occur. It is the practice of the Nuclear Engineering Department Head to not give second chances. Integrity is the foundation of our industry, and those without it will not have a place in our department. The Student Code of Conduct and a link to make reports of Conduct violations may be found here: < <https://studentconduct.utk.edu/> >.

7.4 Grade of Incomplete

Under extraordinary circumstances and at the discretion of the instructor, the grade of I (Incomplete) may be awarded to students who have satisfactorily completed a substantial portion of the course requirement but cannot complete the course for reasons beyond their control.

- The I (Incomplete) grade is not issued in lieu of the grade of F.

- The terms for the removal of the I, including the time limit for removal of the I, is decided by the instructor.
- It is the responsibility of the student receiving an I (Incomplete) to arrange with the instructor whatever action is needed to remove the grade at the earliest possible date, and in any event, within one calendar year of the assignment of incomplete.
- Students do not remove an I grade by re-enrolling in the course.
- The I grade does not carry quality points and is not computed as a grade of F in the grade point average.
- If the I grade is not removed within one calendar year or upon graduation, it shall be changed to an F and count as a failure in the computation of the grade point average.
- A student need not be enrolled at the university to remove a grade of incomplete.

7.5 Appeal Procedure

A graduate student may appeal three types of academic decisions to the Graduate Counsel through the Graduate Council Appeals Committee: (1) grievances concerning the interpretation of and adherence to university, college, and department policies and procedures; (2) grievances concerning grades; and (3), grieves concerning academic penalties imposed for academic and/or research misconduct. The Graduate Council Appeal Procedure can be obtained at the Graduate School or at:

<<https://gradschool.utk.edu/graduate-council/appeals-committee/the-university-of-tennessee-graduate-council-appeal-procedure/>>. Normally, grievances should be handled first at the department level through the student's academic advisor, the Director of Graduate Studies, or the Department Head. Further appeal may be made to the dean of the respective college, the Graduate Council Appeals Committee through the Assistant Dean of the Graduate School, and ultimately to the Dean of the Graduate School.

Appeals may involve the interpretation of and adherence to university, college, and department policies and procedures as they apply to graduate education and the issuance of grades based on specific allowable reasons stipulated in the Graduate Council Appeal Procedure.

Appeal procedures in regard to allegations of misconduct or academic dishonesty are presented in Hilltopics under "Disciplinary Regulations and Procedures." Students with grievances related to race, sex, color, religion, national origin, age, disability or veteran status should file a formal complaint with the Office of Equal Opportunity and Accessibility, 1840 Melrose Avenue.

7.6 Academic Policies for the Administration of Graduate Assistantships

The academic policies related to graduate teaching and research assistantships are found here: < <https://catalog.utk.edu/content.php?catoid=55&navoid=11819>>.

Work assignments for each type of assistantship should be as specific as possible and should be developed to reflect both the needs of the Department and each graduate assistant's obligation to make satisfactory progress in their program. Therefore, to the extent possible an assignment should appropriately reflect teaching hours, office hours, hours to be spent performing research or other specified tasks. Such specifications should be provided in writing at the time the offer is made.

Departments employing graduate assistants will conduct an annual evaluation of each assistant. The results of the evaluation are made available to the assistant and placed in the student's academic file. Appropriate follow-up also should occur. The evaluation, review with the assistant, and follow-up should focus not only on assistant-related work being done but should be preparatory for future employment, thus providing professional growth. In most cases, a graduate assistant's supervisor shares results of the evaluation with the assistant and takes appropriate follow-up action.

In cases where corrective measures must be taken to remediate deficiencies, the graduate assistant should be notified in writing of recommended action to solve the problem(s). Situations leading to dismissal for cause must be described in writing to the assistant being dismissed. This letter should be written by the supervisor with a copy to the Department Head. In cases where the assistant feels that university-related factors (facilities, working conditions, improper supervision, etc.) have had negative effects on specific aspects of job performance, a letter to the supervisor would be appropriate.

Graduate assistants who are performing satisfactorily are normally reappointed up to the maximum time limit as stated below. In situations where the demands of the department do not call for a job to be continued, reappointment may not be made. In cases where a department has a rotational plan for assistantships, graduate assistants likewise may not be reappointed.

When an assistantship is not to be renewed, the graduate student should be notified in advance. In most cases, this notice must be given no later than one month prior to the end of the appointment. Specific reasons for not renewing the contract should be given (e.g., discontinuation of the program or grant, significant neglect of duty, unsatisfactory academic performance or progress toward a degree, non-compliance with university policies, etc.).

7.7 Electronic Communication (“Group Chat”) Policy

The Department has a specific policy on the use of electronic communications with respect to classroom learning. The policy is quoted below. Students should also be cognizant of compliance with all regulations regarding the protection of proprietary, export controlled, or personally identifiable information when using electronic communications platforms. No export controlled or proprietary information should ever be shared on a platform like Zoom, Slack, etc. If you have questions about how to appropriately discuss or transfer export controlled or proprietary information, please reach out to your Major Professor. The group chat policy is below:

“With the recognition that effective learning requires active participation from students both inside and outside the classroom, we acknowledge and affirm the value of additional avenues of discussion between students, TAs, and faculty. These discussions should focus on developing understanding of underlying key concepts of the course and building community among students. These discussions could involve Canvas Forums, Discord, GroupMe, Slack workspaces, Piazza, and other tools that may come available. These tools do not inherently present academic integrity concerns, but students must be mindful of how they engage in these conversations and collaboration tools. Students should not use collaboration tools to share homework, project, quiz, or test answers. Collaboration tools should focus on discussing class concepts and general understanding. Discussion should not venture into disparaging faculty, TAs, or other students; this is harassment in violation of the Student Code of Conduct and will be reported according to the policies set out there. Students can report concerns stemming from discussions in collaboration tools to the faculty or to department leadership. Any discussion forum created for a class should be disclosed to the faculty and all students in that class must have equal opportunity for access. Students who establish these forums (group administrators) should take responsibility for establishing and enforcing the rules of engagement with the discussion. Participants who are not following the established rules can be removed; group administrators may choose to notify the faculty member of any poor conduct.”

8 Links to Important Resources

International students

- o International Student and Scholar Services <<https://international.utk.edu>>
- o International House <<https://ihouse.utk.edu>>
- o ITA Testing Program <<https://gradschool.utk.edu/future-students/office-of-graduate-admissions/ita-testing-program/>>

Funding

- o Costs and funding opportunities <<https://gradschool.utk.edu/costs-and-funding/>>
- o Graduate Student Senate Travel Awards <<https://gss.utk.edu/gss-travel-awards/>>
- o Financial Aid and Scholarships <<https://onestop.utk.edu/scholarships-financial-aid/financial-aid/>>

Professional development & training

- o Office of Graduate Training and Mentoring <<https://gradschool.utk.edu/about-graduate-school/training/>>
- o Best Practices in Teaching Program <<https://gradschool.utk.edu/about-graduate-school/training/gpspd/epit-3/>>
- o UT Libraries Information for Graduate Students <<https://libguides.utk.edu/graduate>>
- o Center for Career Development <<https://studentsuccess.utk.edu/career/>>
- o Teaching and Learning Innovation <<https://teaching.utk.edu>>
 - UT CIRTl: Center for Integration of Research and Teaching <<https://cirtl.net>>
- o Experience Learning <<https://experiencelearning.utk.edu>>

Student resources

- o Bias Education and Referral <<https://studentlife.utk.edu/campusclimate/>>
- o Counseling Center <<https://studentlife.utk.edu/counselingcenter/>>
- o Department Website <<https://ne.utk.edu/>>
- o College website <<https://tickle.utk.edu/>>
- o Graduate School <<https://gradschool.utk.edu>>
- o Graduation Deadlines <<https://gradschool.utk.edu/academic/graduation-deadlines/>>
- o Graduate School Forms <<https://gradschool.utk.edu/academics/forms-central/>>
- o Graduate Catalog <<https://catalog.utk.edu/index.php?catoid=55>>
- o Student obligations and appeals process <<https://gradschool.utk.edu/graduate-student-life/understanding-your-rights-and-obligations>>
- o Graduate Student Senate <<https://gss.utk.edu>>
- o Office of Graduate Admissions <<https://gradschool.utk.edu/future-students/office-of-graduate-admissions/>>
- o Student Conduct and Community Standards <<https://studentlife.utk.edu/studentconduct/>>
- o Equal Opportunity and Accessibility <<https://dae.utk.edu/ea/>>
- o Sexual Misconduct, Relationship Violence, and Stalking <<https://titleix.utk.edu>>
- o Office of Multicultural Student Life <<https://studentlife.utk.edu/campus-culture/>>
- o Office of Research Integrity <<https://research.utk.edu/research-integrity/>>
- o Thesis/Dissertation Consultant <<https://gradschool.utk.edu/academics/theses-and-dissertations/>>
- o Office of Information Technology <<https://oit.utk.edu>>
- o Office of Title IX <<https://titleix.utk.edu>>

9 APPENDICES

9.1 Graduate Student Pay

PURPOSE To establish a policy and pay scale for Graduate Teaching Assistants and Graduate Research Assistants within the department.

POLICY

1. Applies to Graduate Teaching Assistants (GTA) and Graduate Research Assistants (GRA) that are paid by a Nuclear Engineering Department account.
2. A 25% Full Time Equivalent (FTE) position requires that you work an average of 10 hours per week. A 50% FTE position requires that you work an average of 20 hours per week. Appointments exceeding 50% must have prior approval of the Dean of the Graduate School, excluding summer term.
3. Maintenance fees and tuition waivers apply to appointments at a 25% FTE basis or higher. This also includes waivers of the program and services fee, the technology fee, the facilities fee, or the transportation fee. Please see details on fee waivers here:
4. Students holding a 25% assistantship or receiving any type of external financial aid normally must enroll for at least 9 hours in order to be considered full time. Students holding a 50% assistantship must enroll for at least 6 hours to be considered full time. Students conducting thesis research at the master's or doctoral level must take a minimum of 3 hours of research during the summer semester. Refer to the Policy for the Administration of Graduate Assistantships for Additional information.
5. Graduate students are required to maintain an active status through continuous enrollment from the time of first enrollment until graduation. The minimum enrollment for international students may be different, and international students always need to check with the Center for International Education (CIE) in order to determine what minimum enrollment they must maintain to satisfy all enrollment requirements attached to their specific visa.
6. The maximum number of years that a graduate student can be appointed to a 25% FTE or more assistantship is three years as a master's student, five years as a doctoral student, or eight years in doctoral programs in which students enter with a baccalaureate degree only.
7. A GTA position is a 9-month academic position paid over 12 months. A GRA or GRA/GTA position is nominally a 12-month academic position paid over 12 months.
8. The chain of command for a student is their immediate supervisor (Major Professor), then the Department Head, followed by the Dean of the College of Engineering, and, finally, the Dean of the Graduate School.
9. The pay scale policy will be reviewed by the faculty and Department Head a minimum of every three years.

10. The pay scale can be changed with a majority vote by tenure and tenure-track faculty.
11. After passing the PhD qualifying exam, students will receive a \$1,000 increase in salary. Furthermore, doctoral students will receive an additional \$1,000 increase in salary after successfully passing the PhD proposal and advancing to candidacy.

Information about student health insurance plans may be found at the following link: <[Student Health Insurance Plan \(SHIP\) & Frequent FAQ's | Student Health Center \(utk.edu\)](#)>

9.2 Travel Guide

Please follow the steps outlined below when requesting travel for departmental activities. If you have any specific questions, please reach out by email (<netravel@utk.edu>) or stop by the front office (ZEC 421).

1. Set up your profile in DASH by using your UTK NetID and password. The link to access DASH is <https://dash.tennessee.edu/home> >.
2. Assign the following people as travel delegates that can book travel on your behalf: Gina Seifert (gseifer2@utk.edu), Caitlin Darden (ctaylo80@utk.edu), and Sarah Obenschain (sobensch@utk.edu). This will allow the delegates to assist with entering travel requests, booking airfare, and entering travel reimbursements. The travel booking tool, Get There, has a separate delegate access area that we can assist you in adding us if you need travel booked.

All travel must be submitted a minimum of 2 to 3 weeks prior to the trip (or 6 to 8 weeks prior to international travel). Submit all travel requests at <<http://tiny.utk.edu/netdx>>.

- Select Travel
- Select Travel Request
- Click on green “Travel Request” box
- The travel request will be forwarded to your professor for approval.
- Once the request is submitted and approved, we will submit your request in Concur.

International Travel

- All international travel has to be reviewed by the international team/committee prior to entering a travel request.
- These forms must be completed and approved prior to entering the travel request.
- You can find these forms at:
- We recommend these being submitted a minimum of 6-8 weeks prior to travel.

Booking Travel

- Before booking any travel, please make sure to look over the current travel policy < <https://finance.tennessee.edu/travel/> >

- We do have multiple department travel cards that can be used for airfare and conference registration
- Hotels, meals, car rental, etc. will be placed on the traveler's personal card to be reimbursed at the end of the trip
- UT does have rules/policies for what they will and will not reimburse
 - Hotel stays will NOT be reimbursed if booked over 150% of the Conus rate for the area you are staying
 - Here is a link to where you can find out the conus rate for the area you are traveling to: < <https://www.gsa.gov/travel/plan-book/per-diemrates> >
 - Please be aware of sponsor specific travel policies if traveling on a sponsored project
 - We encourage you to use Concur to book your travel
 - Third party agencies (Expedia, Spirit, Travelocity, etc.) do not normally provide detailed receipts, and your travel reimbursement may get rejected
 - Concur is an extension of World Travel Service, which is the Universities' travel agency
 - If your flight gets cancelled, or if you are having any other traveling issues, World Travel will be able to assist

Travel Reimbursement

- At the end of your trip, you will submit your completed T-3 form, as well as all of your receipts, to <netravel@utk.edu>.
 - Please contact the travel team to receive a copy of the T-3 form, if you do not already have a copy.
 - Your receipts will need to be itemized with payment information included (your name listed, as well as the last 4 digits of the card used).
 - Meals are reimbursed at a Per Diem rate set by Concur (based on the location of where you are staying). Please accurately indicate which meals will be reimbursed.
 - There are certain items that will require detailed comments (ex: Lyft/Uber/Taxi receipts must have an explanation of where/to the travel is taking place)
 - If traveling from another location other than Knoxville, a comparison airfare quote is needed. It is better to capture this comparison at the same time you book your flight
 - It is recommended that you submit your travel reimbursement to the department for entry within 30 days of your trip.
 - International travel requests in Concur do expire after 90 days, and late submission expense reports can cause your reimbursement to be delayed.

9.3 Example Oral Qualifier Rubric

Component	Attribute	Does Not Meet Expectations	Meets Expectations	Exceeds Expectations
Literature Review (oral)	1	Presentation is not logical, difficult to follow, and has missing or poor conclusions	Presentation can be followed, and conclusions are reasonable	Presentation follows a logical path; conclusions are supported by documented evidence
Literature Review (written)	2	Does not give adequate coverage of topic; lacks sources and justification	Covers topic, uses appropriate sources, is objective	Demonstrates substance and depth, is comprehensive, shows mastery of material
Addressed Hypothesis	3	Misunderstood hypothesis, incorrectly followed the logical path of the proposed work	Demonstrated understanding of hypothesis	Demonstrated understanding of the hypothesis, clearly followed the path of the proposed work, developed further questions and analyses based on the field
Knowledge of Theory	4	Demonstrated poor understanding of theoretical concepts	Demonstrates understanding of theoretical concepts	Demonstrates mastery of theoretical concepts
Addresses Questions Appropriately	5	Demonstrates little grasp of information, has undeveloped or unclear answers to questions	Shows ease in answering questions but does not elaborate	Demonstrates full knowledge of topic, explains and elaborates on all questions

Evaluation Sheet

Student Name: _____

Subject Matter Selected: _____

Grading: For each rubric category, score the students response with a numerical score between 1 (does not meet expectations), 2 (meets expectations) and 3 (exceeds expectations)

Attribute	Evaluation comments	Numerical Score
Written literature review		
Oral presentation of literature review		
Assessment of hypothesis addressed/proposed follow-on research activities		
Knowledge of Theory		
Addresses Questions Appropriately		
Summary score		

Faculty Committee Members & signatures

Grading

- 5 Categories for rubric/evaluation (15 points total)
 - Where “Does not Meet Expectations” is 1 point
 - Where “Meets Expectations” is 2 points
 - Where “Exceeds Expectations” is 3 points
- Grading evaluation should be consensus among 3 faculty committee member reviewers.
- 10/15 is pass
- 5/15 is fail
- Scores between 5 and 10 should be considered as partial fail & course of action should be discussed amongst the entire faculty.

9.4 Handbook Changes

Handbook changelog (Fall 2025)

- Updated Department Head welcome letter
- Updated PhD Qualifying Exam information and process
- Updated EEB courses for Medical Physics curriculum
- Updated graduate student pay rates
- Included information about the RAD Committee
- Updated DASH information and travel policy/guidelines

Handbook changelog (Fall 2024)

- Updated Department Head Intro
- Updated GRA/GTA pay information
- Updated graduate committee members
- Updated MS degree requirements
- Updated qualifying exam information
- Updated travel policy/guidelines

Handbook changelog (Fall 2023)

- Updated GRA/GTA pay information to reflect 12 month pay
- For students graduating in 2024-2025 academic year or later, we plan to add NE 564 to MS core course list
- Updated graduate committee members
- Updated qualifying exam information
- Updated appendices

Handbook changelog (Fall 2022)

- Clarified that NE 542 is a part of the Nuclear Security qualifier.
- References to NE 572 were removed from this handbook as it no longer exists in the graduate catalog.
- Added information on submitting travel requests.
- Mentioned NEGSA use of Slack.
- Included link to Office of Title IX.
- Updated the type of faculty that can serve on MS committees, clarifying the tenure/tenure track, research faculty, joint faculty, and adjunct faculty can serve on MS committees.
- Removed references to pre-2019 requirements.
- Added common mistakes on Ph.D. candidacy forms (e.g. including NE 598 credits or NE 500 credits).
- Clarified the following timelines for the dissertation:
 - The dissertation defense should be scheduled well in advance (~ 2 months) of the defense examination date.

- The dissertation, in the form approved by the major professor, must be distributed to the committee at least two weeks before the examination.
- Prior to distributing it to the committee, it should be given to, and approved by, the committee chair, so students should provide it to their committee chair 3-4 weeks prior to the examination to give the committee chair a week to review.
- Added information about academic probation.
- Included link to Student Conduct.
- Updated the rates of pay for new students.
- Information on fee waiver for Fall 2022.
- New appendix on travel.
- Introduced handbook changelog.