Interdepartmental Program in Transportation
Doctoral Transportation Guide

Steps to a Doctoral Degree in the Interdepartmental Program in Transportation

1. Complete **General Exam Part 1 (**Core Knowledge) **and Part 2** (Research Aptitude) [by end of Academic Year 2]
2. Complete **Responsible Conduct of Research** course [by end of Academic Year 2]
    a. Instructions Found in Appendix A
3. Formation of Doctoral Thesis Committee following completion of General Exam
4. **Approval of Doctoral Research Proposal** [by Dec. 31, Academic Year 3]
5. Meet regularly [minimum of once per year] with Doctoral Thesis Committee
6. Doctoral Degree earned with satisfactory defense of the Ph.D. thesis [Academic Year 5 or 6].

In this document you will find specific information pertaining to:

- Degree Program, Funding, Thesis Supervision and Registration
- Research Requirement, 1.THG and Expectation of Satisfactory Progress
- General Exam Process
- Thesis Proposal and Annual Committee Meetings
- Defense and Thesis Submission

Degree Program, Funding, Thesis Supervision and Registration

Doctoral Program

A Doctoral Program in the Interdepartmental Program in Transportation consists of 120 units of graduate level coursework, including a base in Transportation System Analysis (TSA) that consists of subject 1.200 + one of (1.202, 1.208, 6.7260, 1.260 and 11.478) and then a set of five defined research areas that are represented by two subjects (see page 4). Students must also enroll in 11.251 Frontier of Transportation Research in the fall and spring of their first year and fulfill a computation/analytics requirement and select one of the following subjects: 6.C51 + 1.C51, 6.3732, 6.7910/9.520, 6.7900,15.071, or 15.072.

Required Transportation Systems Analysis (TSA) Base

- 1.200 Transportation: Foundations and Methods (12 units)
- Select one (12 units)
    - 1.202 Demand Modeling
    - 1.208 Resilient Networks

    - 6.7260 Network Science and Models
    - 1.260 Logistics Systems
    - 11.478 Behavioral Science, AI, and Urban Mobility
- 11.251 Frontier of Transportation Research (3 units)
  Students enroll in the subject in the fall and spring of their first year (6 units earned over two terms)

Computation/Analytics Requirement Subjects (select one)

- 6.C51 Modeling with Machine Learning: from Algorithms to Applications + 1.C51 Machine Learning for Sustainable Systems (must be taken and completed simultaneously)
- 6.3732 Statistics, Computation and Applications
- 6.7910/9.520 Statistical Learning Theory and Applications
- 6.7900 Machine Learning
- 15.071 The Analytics Edge
- 15.072 Advanced Analytics Edge

The remainder of the doctoral program consists of a set of specialized subjects in transportation and related fields (see page 4). MIT graduate-level subjects taken to fulfill the requirements of the MST degree may be included in the doctoral program.

Funding
All students admitted to the doctoral program are financially supported with Research Assistantships (RA) and/or internal or external Fellowships. This funding includes paid tuition and health insurance, and a monthly stipend.

Thesis Supervision
A student's thesis supervisor can be MIT Interdepartmental Transportation Faculty member(s) or MIT Interdepartmental Transportation Senior Research Scientist/Engineer. A thesis supervisor is responsible for certifying and signing the thesis. In the case of co- supervisors, both must certify and sign the thesis.

Emeritus faculty
Emeritus faculty can be involved in mentorship of graduate students at their discretion, without compensation. They can serve as co-advisors if there is a primary advisor who will provide funding and who is actively engaged in supervising a student. It is acceptable for emeritus faculty to serve as PhD committee chair.

Research Requirement, 1.THG and Expectation of Satisfactory Progress

Research plays an integral role in the PhD degree, and this research effort is tracked academically through enrollment in 1.THG. The number of credit hours is determined in consultation with your advisor. If a student is registered only for 1.THG during a term, the

program recommends a load of 36 units. Through enrollment in 1.THG, students are formally graded on research performance each

semester and 1.THG in the semester when a student is on the degree list in accordance with MIT Faculty Rules and Regulations 2.62.3 and 2.62.1. http://facultygovernance.mit.edu/rules-and-regulations.

Students earning an MST on their degree path toward the Transportation PhD will follow 1.982 registration guidelines as outlined in the MST program guide.

Receipt of "J" grades in 1.THG signals satisfactory academic progress in the research associated with a student's funded appointment. A "U" grade is used to indicate unsatisfactory research progress. Following a "U" grade, the student will receive a departmental letter outlining steps needed to meet research expectations. If a student earns two consecutive "U" grades the students funding may be withdrawn and further registration at the Institute denied such that a student may no longer continue in the Transportation PhD program.

General Exam Process

All doctoral students are expected to take the General Examination no later than the fourth term of graduate study at MIT.

General Exam Part 1 [Core Knowledge]

A Doctoral Program in the Interdepartmental Program in Transportation consists of 120 units of graduate level coursework, including a base in Transportation System Analysis (TSA) that consists of subject 1.200 + one of (1.202, 1.208, 6.7260, 1.260 and 11.478) and then a set of five defined research areas that are represented by two subjects. Note that some subjects appear as one of the base electives and in the research areas. When this occurs, students may **not** use one subject to satisfy both the base and the research areas.

The student should consult their faculty advisor when preparing their Doctoral program of study. **Part 1 of the General Exam** is structured to test core knowledge, testing the base Transportation Systems Analysis and then one of the five defined research areas. To pass General Exam Part 1, the student must receive a grade of A in all four subjects (allowing maximum two A-s with the approval from the lead faculty in the area of focus). The four subjects are comprised of two from Transportation Systems Analysis: 1.200 + one of (1.202, 1.208, 6.7260, 1.260 and 11.478) and two subjects selected from one research area. If a student selects the research area, "Planning and Policy", students must take one separate written exam.

The subjects identified in the research areas are firm and rarely are exceptions permitted. In the circumstance where a subject is not offered for two consecutive academic years and there are no other options within the 2-Subject list, a comparable level graduate subject may be substituted with approval from a student's advisor and Transportation Director. The process for substitution is a memo, that includes the rationale for the substitution and the advisor's

signature of approval, which is reviewed by the Transportation faculty during the PhD application review.

General Exam Part 1 Subjects

Required Transportation Systems Analysis (TSA) Base

- 1.200 Transportation: Foundations and Methods (12 units)
- Select one (12 units)
    - 1.202 Demand Modeling
    - 1.208 Resilient Networks
    - 6.7260 Network Science and Models
    - 1.260 Logistics Systems
    - 11.478 Behavioral Science, AI, and Urban Mobility

Select one of the five approved research areas (select two subjects from each area):

1. Performance and Optimization: (6.7700 or 6.7720) and (15.093 or 15.081 or 6.7920)
    a. 6.7700 Fundamentals of Probability or 6.7720 Discrete Probability and Stochastic Processes
    AND
    b. 15.C57 Optimization Methods OR 15.081 Introduction to Mathematical Programming OR 6.7920 Reinforcement Learning: Foundations and Methods
2. Planning and Policy: two of 11.478, 11.526, 11.540 **[written exam required for this area]**
    a. 11.478 Behavioral Science, AI, and Urban Mobility
    b. 11.526 Comparative Land Use and Transportation Planning
    c. 11.540 Urban Transportation Planning
3. Networks: (6.7260 or 1.208) and (15.083 or 15.094)
    a. 1.208 Resilient Networks OR 6.7260 Network Science and Models
    b. 15.083 Integer Optimization OR 15.094 Robust Modeling, Optimization, and Computation
4. Logistics: If 1.260 is NOT used in the TSA base, 1.260 and (15.764 or (15.762 + 15.763)). If 1.260 is used in the TSA base, 15.764 and (15.762 + 15.763)
    a. 1.260 Logistics Systems
    b. 15.764 The Theory of Operations Management
    c. 15.762 Supply Chain Analytics and 15.763 Supply Chain: Capacity Analytics
5. Demand: If 1.202 is NOT used in the TSA base: 1.202 and (1.205 or 14.382)

If 1.202 is used in the TSA base: 1.205 and (14.382 or (14.380 + 14.381)

Note for either selection (14.380 + 14.381) and 14.382 can be replaced with one of the following more advanced subjects: 14.384, 14.385, and 14.386.

a. 1.202 Demand Modeling
b. 1.205 Advanced Demand Modeling
c. 14.382 Econometrics
d. 14.380 Statistical Method in Economics and 14.381 Estimation and Inference for Linear Causal and Structural Models
e. 14.384 Time Series Analysis
f. 14.385 Nonlinear Econometric Analysis
g. 14.386 New Econometric Methods

General Exam Part 2 [Research Aptitude]
This exam tests the following skills. First, can the student formulate a research question, set out a plan of research, and interpret the results. Second, can the student clearly present and defend this research. Third, does the student have sufficient understanding of the field to answer a broad range of questions and to comment on relevant literature. The research presented by the student can be drawn from their MST thesis, their current RA at MIT, or research conducted as part of a previous position. The research must be in the same field as the subgroup core listed in the Doctoral Program.

Part 2 of the General Exam must be completed by the end of the fourth academic term. In most cases, this exam occurs in April or May of AY2. Students should consult their research advisors when choosing the members of the evaluation committee (see requirements below). Your Part 2 general exam committee should be similar or identical to the thesis committee.

Students *must* submit the Part 2 Schedule Form [available at https://cee.mit.edu/resources/] before the beginning of the term in which the exam will be held, which is the end of January for exams in April/May of AY2.

The exam has three components:
1. A written document describing research completed.
2. A review of a relevant publication chosen by your advisor. The paper will be assigned one week before the presentation meeting.
3. A 30-minute oral presentation of research completed with significant questioning from committee.

Research Paper
The research paper should have a maximum of 10 pages, single-spaced, with 12-pt font and should review research done to date. The page limit includes figures, but not references.

Students may ask their advisor for advice in the preparation of this document. Students may also get assistance from MIT's Writing and Communication Center, http://writing.mit.edu/wcc and the CEE Communications Lab, https://mitcommlab.mit.edu/cee/. The following elements must be included:

Abstract - A concise summary of the motivation, research objectives, methods, and key results. A person unfamiliar with the topic should be able to understand the abstract.

Introduction – [≈ 2 pages] At least one paragraph should be written for a general audience, clearly enunciating why someone outside your field should care about this work. The introduction should also contain a detailed literature review that explains how your research done to date is related to previous research in the field and what your research will add to the larger body of research. Finally, the introduction should clearly state the short- and long- terms goals of the work, connecting to a broad engineering or societal problem that motivates the work.

Methods – Describe and defend your methods, including your assessment of uncertainty. Include citations of previous applications of the method.

Results - Describe specific results, including a careful explanation of the uncertainty.

Discussion - Compare and contrast the results with other studies, including citations. Explain how you have addressed the technical questions and long-term applications mentioned in the methods and introduction.

The student distributes the research report to their committee **a minimum of one week** before the presentation. The student should inquire whether each committee member prefers a pdf or hard copy and deliver the preferred format.

Review of a Relevant Publication

Your advisor, in consultation with the GE2 committee, will select a single journal publication in your field. It may be a seminal paper from years ago or a new paper. It should not be longer than 20 pages and cannot be too broad, e.g., no general reviews of the field, nor should it be written by a member of the committee. You should be prepared to informally discuss the paper (no slides), focusing on a set of 2 to 4 questions that will be provided by the committee when the paper is assigned. The questions may include some of the following, or they may be more specific to the paper. Please prepare for the paper review on your own.

- What is the most important result and why is it significant?
- What is the value of the paper to the broader field?
- What are the limitations of the work and results presented?
- What is the most significant uncertainty and how could it be reduced? How do the results of this paper relate to your research?

- Please show the full derivation of equation (5). Are all the conclusions justified by the results? Are the boundary conditions realistic?
- Explain in physical (chemical, biological) terms why the relationship shown in Figure 7 makes sense or does not make sense.
- How does this paper challenge the existing theory regarding _____ ?
- Propose a new research question or hypothesis that expands on the work presented in this paper, i.e., where would you go next? Defend your choice.

Oral Presentation Meeting

The student should schedule the committee meeting for 2 hours. The Chair of the Committee, who will be sent specific instructions before the meeting, runs the meeting. The student will begin by informally presenting their response to the question(s) posed by the committee regarding the paper chosen for review (see *Review of a Relevant Publication* above). The student should not prepare slides for this response. Necessary visuals or equations can be sketched on the black board. Committee members may ask questions for clarification or to go into further depth. After twenty to thirty minutes, the committee chair will end this discussion and instruct the student to begin their research presentation on work done to date. The student should plan a 30-minute presentation, but the actual presentation will take longer as faculty will interrupt with questions. The committee members are expected to have read the report and come prepared with questions. The committee members should push questions to the point at which the student says, “I don’t know”. The student should not be afraid of saying, “I don’t know”. It is at this point that the real scientific discourse begins, an exchange of ideas that provides a learning experience for the student. It is important to note that the research advisor is encouraged to ask questions, but he/she *should not answer questions*. This is a test of the student's understanding and research ability, not a test of the advisor’s research ideas. The GE oral presentation also serves as a practice for the student in preparation for their thesis proposal, which has a similar format, and is distinct in topic as it will talk about future research.

Evaluation Committee for General Exam Part 2

The evaluation committee for Part 2 is comprised of three people, including the student’s thesis advisor. The committee must have a minimum of two faculty or Senior Research Staff in the Transportation Education Committee (TEC). In many cases this group will become the Doctoral Thesis Committee. The chair of the evaluation committee must be a faculty member or Senior Research Staff in TEC and cannot be the thesis advisor. The student invites the committee members and includes their names on the Part 2 Schedule Form.

General Exam Part 2 Outcomes

After the exchange of questions and ideas has finished, or at 1hr 40 min, whichever comes sooner, the committee chair will ask the student to leave and wait nearby. The faculty advisor will be given a few minutes to add their perspective on the student’s performance that day, on the student’s broader research ability, and any specific requirements for the student. The committee chooses one of the following outcomes, which must be communicated with the student immediately following the meeting.

1. Pass with no additional requirements (may include minor changes to paper)
2. Re-take (may include additional requirements as noted below)
3. Fail with no option to retake (only if this is a second attempt)

Additional requirements could include any activity that the committee feels will improve on a perceived deficiency in core knowledge or research skill. Here are some examples:

- Repeat a class as a listener to strengthen weakness in fundamental knowledge.
- Write a detailed review of a particular experimental method or paper.
- Take a public speaking course.
- Meet with writing center staff to go over research paper.
- Do a more complete literature search.
- Re-write a section of the research paper.
- Complete additional analyses on the data presented in the paper.

The student is informed of the outcome directly after the meeting. In addition, the outcome is officially recorded with the General Exam Part 2 form [available at https://cee.mit.edu/resources/] that is sent to the Assistant Director of Academic Program Administration (Sarah Smith) at the Academic Programs Office (Room 1-290; ssmith1@mit.edu) and provides a copy to the student.

Completion of any additional requirements will be monitored by the faculty advisor and communicated to the Assistant Director of Academic Program Administration (Sarah Smith) when completed.

Thesis Proposal and Annual Committee Meetings

Doctoral Thesis Committee and Approval of Doctoral Research Proposal

After passing Part 1 and Part 2 of the General Exam (typically at end of AY2), the student schedules a Thesis Proposal meeting, i.e., typically by the end of Fall Term AY3. The Doctoral Thesis Committee is composed of at least two members of MIT Interdepartmental Program in Transportation's faculty or senior research staff. If appropriate, the student may invite members from outside MIT. The Committee Chair must be a faculty member of the Interdepartmental Program in Transportation and may not be the student's advisor. Once the Thesis Committee is formed, the student prepares a Research Proposal and schedules a date to present the proposal orally to the Doctoral Thesis Committee. The objectives of the research should be prepared with guidance from the advisor. Because most doctoral research is funded by existing projects developed by the advisor, it may need to meet specific benchmarks. The proposed work must accommodate these constraints. The proposal should be a maximum of 15 single-spaced pages. The necessary components are given below. The oral presentation is 45 minutes, followed by 45 minutes of questions.

Required Components in the Research Thesis Proposal

The thesis proposal should be a maximum of 15-pages of single-spaced, 12-point font. Figures are included in the page count, but references are not. The following sections must be included:

Abstract - A one-page (or less) summary of the topic, the objectives/hypotheses to be achieved/tested, and the methods. The abstract should be written for a general scientific audience, i.e. a person unfamiliar with the topic should understand what is being proposed and why it is important.

Introduction - The goal of this section is to motivate the research. Convince the reader why the project is important. The following progression is recommended. Introduce the topic and explain the broader relevance, e.g. what is the practical or fundamental importance. Demonstrate familiarity with previous studies. Identify knowledge gaps and connect to the proposed research.

Objectives and Hypotheses - Clearly state the research question to be answered and/or hypotheses to be tested and support it by explaining the logic that led to it. Preliminary data may be used as support.

Proposed Research - Describe the methods in sufficient detail to give a clear picture of how each research question will be answered and/or how each hypothesis will be tested. Include a timeline to demonstrate that the proposed work is feasible within the duration of a PhD degree. Describe specific expected results.

Defense of Thesis Proposal to Doctoral Thesis Committee

At least 10 days prior to the proposal defense, the student e-mails copies of the written proposal to the committee members with a final schedule of when and where the presentation will take place. After e-mailing the proposal to the committee, the candidate should neither solicit nor expect to receive feedback from any of the committee members, including the advisor, prior to the presentation. On the day of the proposal defense, the student brings a copy of the form, Record of Approval of Doctoral Thesis Research, which is available at https://cee.mit.edu/resources/, as well as a pdf copy of their thesis proposal.

During and after the oral presentation, the Committee members ask questions related to the presentation, the written proposal, and the general topic of the proposed research. The Committee may raise questions about the motivation, novelty, potential impact, and feasibility. As in the Part 2 evaluation, the research advisor is encouraged to ask questions, but should not answer questions. If necessary, the advisor may prompt the student with further questions to help them answer on their own. Remember that this is a test of the student's understanding and research ability. It is not a test of the advisor.

At the end of the question period, the student is asked to leave the room while the Committee (including the advisor) evaluates the candidate’s performance in these areas: quality of written presentation, quality of oral presentation, technical quality of proposed research, feasibility of

research within duration of degree, ability to respond to questions. The possible outcomes are:

1. Accept as written.
2. Accept with modifications
3. Retake within 6 months – the committee must include a list of specific deficiencies
4. Fail with specific notes on deficiencies (only if this is the second attempt)

The Committee Chair records the outcome and any specific requirements for alteration on the form Record of Approval of Doctoral Thesis Research. The Committee Chair forwards the completed form and a pdf copy of the thesis proposal to the Assistant Director of Academic Program Administration (Sarah Smith) in the Academic Programs Office (Room 1-290) and provides a copy to the student.

After the approval of the thesis proposal, the student schedules regular meetings with the doctoral committee to demonstrate progress and receive feedback. Two meetings per year are strongly recommended, with a minimum requirement of one per year. In addition, the committee chair may require additionally meetings in response to significant problems or changes in research direction. The student should bring a copy of the form, Record of Doctoral Thesis Committee Meeting, to each meeting. The form is available at https://cee.mit.edu/resources/. The student should submit the original, signed form to the Academic Programs Office (cee-apo@mit.edu), and should keep a copy of the form for their own records. The minimum requirement will be assessed during each Interdepartmental Program in Transportation Grades Meeting (January and May) using the forms on file at the Academic Programs Office.

Defense and Thesis Submission

Approaching the Defense of a Doctoral Thesis – Green Light Meeting

One or two months before the anticipated doctoral defense date, the student must convene a final committee meeting, called the Green Light meeting, usually around 90 minutes in length. The student presents an outline of the full thesis, highlighting results from each chapter, indicating papers published, in review or in prep, and lays out a timeline for completion. They may then spend time discussing new results (since last committee meeting) and the plan for uncompleted work prior to the defense. The committee will provide their opinion of what is the weakest component of the work and what they foresee as possible stumbling blocks for completion. The committee will then decide whether to approve the outline, which allows the student to schedule the thesis defense. If the committee approves the work, they will sign the *Green Light Thesis Committee Meeting* form [available at https://cee.mit.edu/resources/]. The student downloads the form and brings to the meeting and the Committee Chair completes and submits following the instructions on the form. A copy of the form should also be provided to the student by the Committee Chair. Once this form has been received, the student can schedule the doctoral defense.

Checklist for Doctoral Thesis
MIT has specific guidelines for writing and formatting your thesis. Please follow them closely. https://libraries.mit.edu/archives/thesis-specs/

Please also refer to the Degree List Resources Dropbox for a formatting guide, templates, and other helpful items.

MIT has three degree-granting cycles per year: February, May/June and September. Several months prior to the defense date, the student should register to be on the appropriate degree list, by going to student.mit.edu; selecting "online degree application," and following the instructions. Once this registration is complete, the Assistant Director of Academic Program Administration will send the student an email outlining the steps to complete the degree and organize the thesis defense within the timeline required for the selected degree-granting cycle.

Preparing for and Scheduling your Defense
The doctoral defense must occur a **minimum two weeks** prior to the department's thesis submission deadline. The date changes each year, so the student must check with the Assistant Director of Academic Program Administration to find out the date for a particular degree list. The first draft of the thesis must be sent to the committee two weeks before the scheduled defense date. At least 10 days prior to the defense date the student should communicate the date, time and location to the Assistant Director of Academic Program Administration and fill out the abstract template, which is available from the Assistant Director of Academic Program Administration. The student should also send a pdf copy of the thesis draft to be shared with the CEE and Transportation faculty prior to the defense.

Planning the Public Presentation.
The thesis defense has two components, an in-person public presentation and a closed session with the thesis committee. The entire thesis committee must attend the defense, either in person or remotely via web-conferencing. The public presentation should be 40 minutes long and have a ten-minute questions period at the end. The student should encourage lab- and classmates to attend the public presentation. The public presentation must accommodate a broad audience, with an Introduction that is understandable to a general audience (including family members), but with other sections demonstrating technical depth that may only be accessible to people within the field.

After the public presentation is completed, the audience is asked to leave, so that the closed session can begin. The closed session will range from 30 minutes to 1.5 hours long. A *Record of Successful Defense* form [available at https://cee.mit.edu/resources/]. The student downloads the form and brings to the defense and the Committee Chair completes and submits following the instructions on the form. A copy of the form should also be provided to the student by the Committee Chair.

To book a room in CEE, use the conference room scheduling tool: https://scheduling.mit.edu/cee. We suggest a reservation of 3 hours – with a start time 15 to 20 minutes before the scheduled defense start time and an end time 15 to 20 minutes past the projected meeting end.

Submitting the Thesis to the Academic Programs Office

The committee will usually request edits to the written document. Once the edits have been completed, the student submits two copies electronically. The final copies must be submitted by 5 pm on the department's deadline and follow the electronic submission instruction which are provided by the Assistant Director of Academic Program Administration.

Important Notes on Thesis Completion:

- All thesis content must be present in draft form prior to the defense. When a PhD document is sent to the department to circulate two weeks in advance of the defense, the APO will verify that all the chapters listed in the Table of Contents are present in the document. If not, the APO will follow up with student and advisor.
- When the final thesis is submitted to the department:
    - the APO will confirm receipt via email.
    - the final thesis will be submitted by the APO to the MIT libraries.
- No substantive changes can be made to the final thesis after it is submitted to the department. Only minor modification (e.g., replacing a single page with an incorrect figure) will be considered prior to submitting the thesis it the MIT library, and must be approved by the Graduate Officer.
- The student's graduate appointment will be terminated on the day of their thesis submission.
    - Prorated tuition and fees are available to graduate students who complete their thesis early. The APO will notify the Registrar that the student is leaving

Congratulations!! We look forward to the hooding ceremony and commencement to celebrate!

Appendix A :: General Overview of Administrative Requirements for the Doctoral Degree

Transfer Credit
Up to 24 units of graduate credit taken outside MIT may be transferred to the Interdepartmental Doctoral Program. All transfer credits must be related to the proposed doctoral research area. The CEE Academic Programs Office routes transfer credit requests from outside of MIT to the Transportation Director for Approval. The same process applies for transferring up to 24 units from an MIT Masters program, with the exception of the Master of Science in Transportation.

Form Submission Instructions
Students are responsible for filling out and acquiring signatures for the Doctoral Program Form and also the General Exam Part 2 scheduling form.

For the following forms the Committee Chair is responsible for acquiring signatures and submitting to the Academic Programs Office [full instructions on the forms]:

- General Exam Part 2 Completion Form,
- Record of Approval for the Doctoral Thesis Research Proposal,
- Record of Doctoral Thesis Committee Meeting,
- Record of Doctoral Thesis Green Light Meeting,
- Record of Doctoral Dissertation Defense

All forms can be downloaded and submitted from this page: cee.mit.edu/resources

Summer Tuition Subsidy
Graduate students who are enrolled in a research degree program and who are **not** taking subjects are eligible to have their summer tuition subsidized from Institute general funds.

The subsidy applies to new or continuing graduate students in normal resident status during the preceding spring term, and who are only registered for thesis or pre-thesis research credit during the summer.
Some key points to remember:

- Graduate students who register for other summer subjects will be charged tuition on a per unit basis up to the maximum tuition.
- Students registering for summer internship subjects are not eligible and will be charged the per unit rate, up to a maximum of four units.
- Be sure to confirm with your advisor before registering for any summer subjects.

The Registrar's office oversees this subsidy and the source information for the points noted above can be found here: https://registrar.mit.edu/registration-academics/tuition-fees/graduate/summer-tuition-subsidy

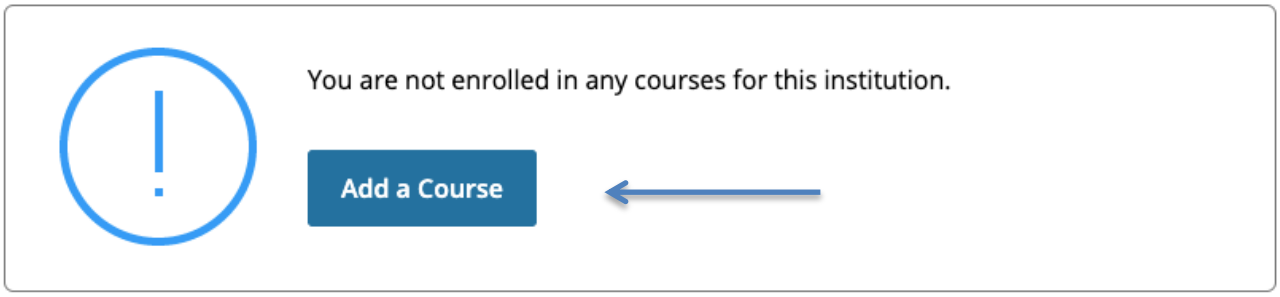
Appendix B :: Responsible Conduct of Research

Responsible Conduct of Research

Each PhD student is required to complete MIT's online course on the Responsible Conduct of Research within the first two years, i.e., by Spring term of AY2. If you are paid on an NSF grant, you are required to complete the course within 60 days of being assigned to the grant. You can access the course from this web site and following the instructions below. You will need an MIT certificate.

https://research.mit.edu/integrity-and-compliance/citi-training-courses/take-citi-courses

1. In the center of the page, slick "Log into CITI (Touchstone Required)"
2. Set up your account
3. Select "My Courses" 5. Select "Add a Course"
4. Select "Add a Course"



5. Go to question 4 and select "RCR for Engineers"
6. Complete the Integrity Assurance Statement before beginning the course.
7. Once you have completed the course (10 modules with 80% or better on the individual quizzes) send a screen shot of your completion report to the Academic Programs Office (cee-apo@mit.edu)

Appendix C :: Responsible use of Generative AI in Thesis Research

Each student is responsible for the integrity of their research and publications.

1) Prior to using generative AI for research or writing, the student must discuss these plans with their advisor.

2) It is the student's responsibility to verify the validity and novelty of all substantial content [data, code, text, images, methodologies, ideas, concepts] produced by generative AI that is not directly referenced or attributed in the thesis. Be aware that AI can generate incorrect information and fake references, as well as ideas that already exist in the literature, which could put you at risk of plagiarism. Be sure to review the literature yourself and use the appropriate citations.

3) Published work must describe the use of generative AI in the methods or implementation details in sufficient detail that others can reproduce the steps of the analysis. Keep track of what tools are used and how they are used from the start of research and throughout your thesis research process.

Students will be questioned on their responsible use of generative AI during the General Exam, Thesis Proposal, Green Light Meeting, and Thesis Defense. Students should be able to clearly enunciate what they did versus what was done by generative AI.