



VANDERBILT
UNIVERSITY

Graduate Student Handbook

*Department of Mechanical
Engineering*



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*Department of
Mechanical Engineering*

Academic Year: 2025-2026

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Graduate Student Handbook

This Handbook is intended to supplement and not replace direct, open, and frequent communication between students and their respective advisor, Directors of Graduate Studies, or other faculty and staff, and the Department Chair. Students are encouraged to ask questions and seek clarification of the requirements and expectations set forth in this handbook or in any of the references cited herein.

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IMPORTANT RESOURCES

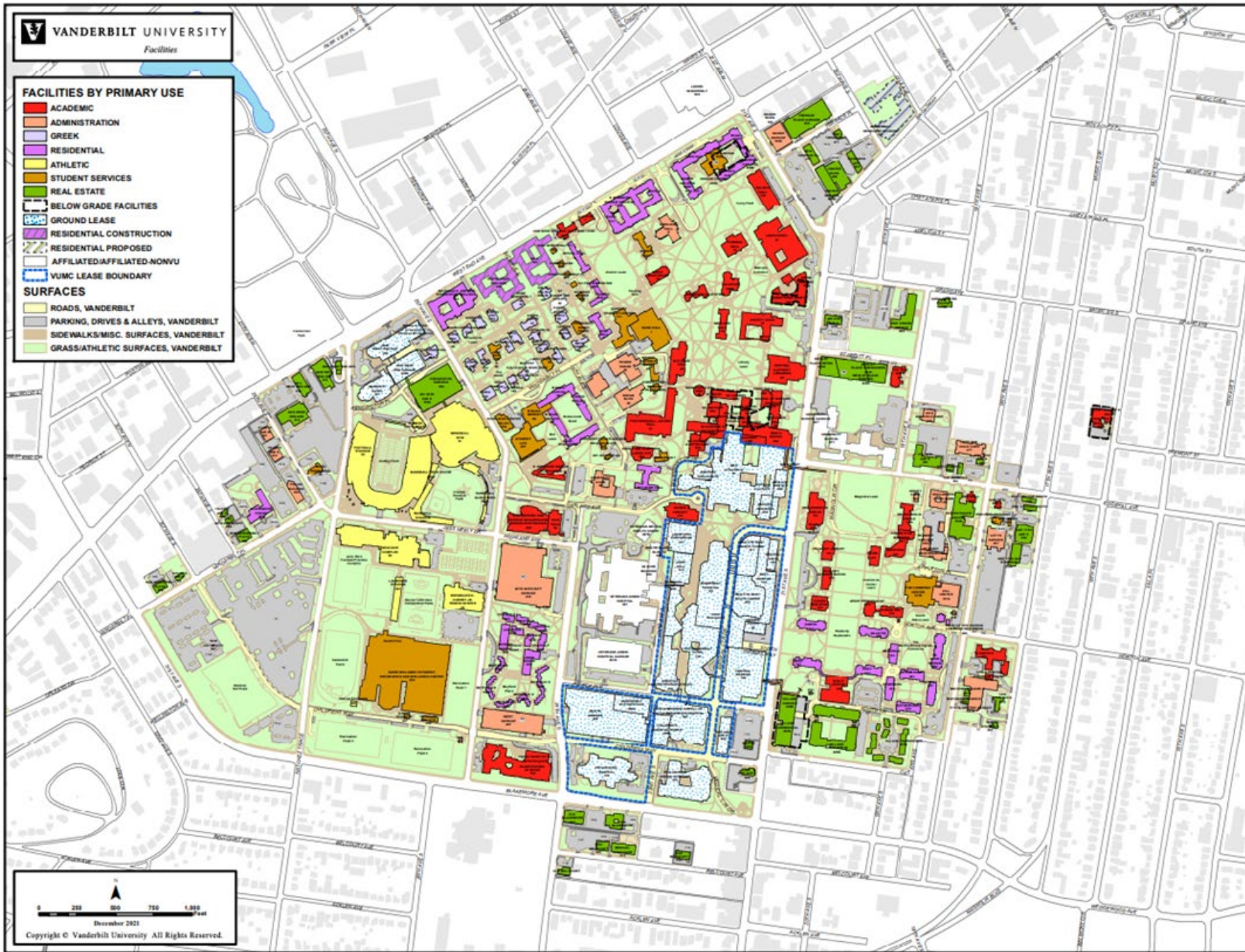
Engineering Dean's Office	615-343-3773
VUIT Help Desk	615-343-9999
Public Safety (VUPD) – Non-Emergency	(615) 322-2745
Public Safety (VUPD) - Emergency	911
Parking Services	(615) 322-2554

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Helpful Information for New Graduate Students

I. Getting a Parking Permit

For the protection of Vanderbilt University students, faculty & staff, no parking is allowed anywhere on campus without a valid Vanderbilt University registration permit, except by visitors in spaces designated for visitors.

Parking decals are available at the Vanderbilt University Police Department located at 2800 Vanderbilt Place, Nashville, TN 37212. Business hours are Monday through Friday from 7:30 AM to 4:00 PM, except holidays. Cash is no longer accepted to purchase parking permits.

Virtual Parking Permits are available to order online here:

https://vanderbiltparking.t2hosted.com/cmn/auth_ext.aspx

Applicants must bring:

1. Student identification cards. If residing off campus, students must provide verification of address (e.g., copy of lease, utility bill, etc.).
2. Year, Make, Model, and color of your vehicle. The state and license plate of the vehicle
3. Your Driver's License.

Continuing students will be able to register online. See the web site for details.

http://www.vanderbilt.edu/traffic_parking/permit-parking.php

Parking maps are available online at:

<https://vanderbilt.maps.arcgis.com/apps/webappviewer/index.html?id=ff74421dab8e42129c698ef967ca98c8>

II. Getting a Student ID Card

The CARD Office

184 Sarratt Student Center, Nashville, TN 37240

(615) 322-2273

M-F 8:30-4:00

The CARD is your student ID card. With it you are able to access: debit spending accounts, VU Meal Plans, libraries, authorized areas of Olin Hall and the Student Recreation Center. By completing the CARD Selections and Guarantor Agreement Form, VU Meal Plans and debit spending funds will be placed into your account at the beginning of the semester. There are meal plans available, more information can be found here :

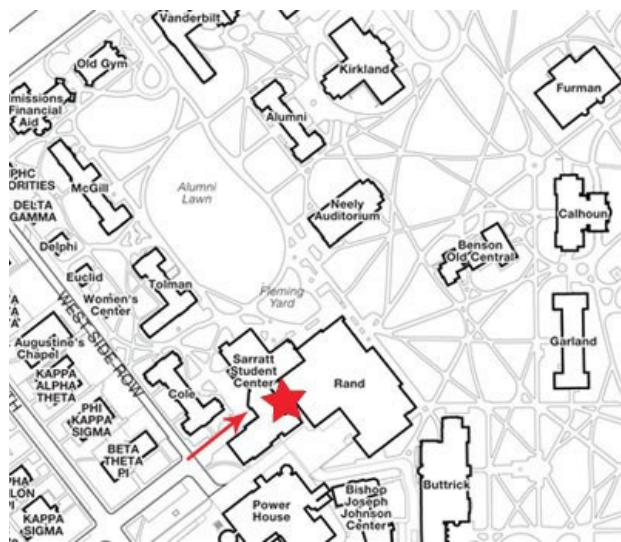
<https://campusdining.vanderbilt.edu/meal-plan-2023-2024/>

What to bring to get a CARD

Students: Driver's License or Passport and letter of admission.

Students, Faculty and Staff will receive their first CARD free of charge. Replacement cards cost \$25.00

Below is a map showing the location of the Sarratt Student Center. The link to FAQ's is located at: <https://www.vanderbilt.edu/cardservices/students/index.php>



III. Registering for Classes

1. Meet with your academic advisor prior to registering for classes.
2. Remember 9-12 hours is considered full time. You are also required to take ME 8991 seminar each semester for '0' hours. This seminar meets on Mondays; times and locations vary by semester.

If you have a conflict, you must get confirmation from your advisor to allow absence.

Students are responsible to a timely payment of all fees and charges not covered by your admission letter. **Some student activity and recreation fees are not covered and are paid by the student.** Students should stay abreast of the various course registrations and drop/add deadlines. Failure to do so may cause LATE FEES to be applied to student accounts and those fees are payable by the student.

IV. Getting your VUNet ID

Please visit the web link below for information on acquiring your VUNet ID and e-password: <https://hr.vanderbilt.edu/oe/epassword.php>

Some FAQ's:

Q: What is a 'VUNetID' and how do I get one?

A: VUNetID is the means for Vanderbilt users to identify themselves to the services on the VUNet, the campus data network. Currently enrolled students, faculty, and staff members on record with Human Resource Services are automatically eligible for a VUNetID. You will have the same VUNetID for as long as you remain a student or employee of Vanderbilt. You must activate your VUNetID by visiting:

<https://www.vumc.org/it/accessvumc>

Q: How do I change my e-password?

A: If don't you know your current e-password, you must ask a VUNet Services Administrator to set your VUNetID to 'reauthorization' status. You will then be able to set a new password using the authorize tool.

Q: What is an e-password?

A: The enhanced security password is the latest, most secure way of identifying yourself to online services at Vanderbilt. The extra security an e-password provides is necessary for access to secure applications. Students can use it to access things like their academic records. These and other applications are possible only with users operation in the more secure environment an e-password provides.

Q: How do I change my VUNetID?

A: You cannot change your VUNetID once one has been assigned to you. It does not really matter if your name has changed because nobody uses your VUNetID other than you.

V. Accessing your VU Webmail

Most students today have a variety of email applications including Google, Yahoo, Comcast, Hotmail, etc. However, it is important that a student activates their VUNetID and starts viewing their VU mail account on a daily basis. VU mail is the preferred method of communication between the faculty/staff in the Department of Mechanical Engineering and the students. Information pertaining to class work, and other important announcements related to the Department and the School is disseminated via VU mail.

Once you have activated your account, you can view your email by visiting the following website regardless of whether you are on-campus or off-campus:

<http://www.vanderbilt.edu/email/>

Please read the policy & guidelines to ensure that the University's information technology resources are used appropriately <https://hr.vanderbilt.edu/policies/electronic-communications.php>

VI. Other Relevant Information

<http://www.vanderbilt.edu/student/>

The web link above is a good resource for information on various topics including:

- Schedule of Courses
- Academic Calendar (holidays, exams)
- Library (online catalogs, journals)
- Student Handbook (rules and regulations, rights and privileges)
- Honor Code
- Activities and Organizations
- Student Recreational Center
- Student Accounts
- Financial Aid
- Student Loan

INTRODUCTION

I. Basic Program Philosophy

The graduate and professional programs in mechanical engineering are designed to provide advanced competence in mechanical engineering through didactic course work in mechanical engineering and related areas such as mathematics and electrical engineering. Further, research experience is provided for students enrolled in M.S. and Ph.D. graduate degree programs. These regulations state the requirements for M.Eng, M.S. and Ph.D. degrees in mechanical engineering and policies for student advising, guidance, performance review and financial aid. This information is intended to supplement and expand upon the regulations of the Graduate School and the Engineering School. The student is urged to read and be aware of the contents of the Graduate School Bulletin and Academic Regulations located at:

<https://vanderbilt.edu/enrollmentbulletin/>

II. Requirements for Entry

A. Master of Science (M.S.) Program

The following preparation is required for admission to the M.S. Program.

1. Satisfactory completion of appropriate course work in an accredited undergraduate program demonstration proficiency, and an undergraduate transcript indicating such is suitable evidence. Proficiency may also be determined by examination at the discretion of the advisory committee (see Section IIIC below).
2. The student's background and preparation should include the following basic areas at the undergraduate level:

SUBJECT	VANDERBILT COURSE
Fluid Mechanics	ME 3224
Mechanics	CE 2200, CE 2205, ME 2190, ME 3202
Thermodynamics	ME 2220
Design Synthesis	ME 4950
Experimental/Instrumentation	ME 2171
Computer Programming	CS 1101
Heat Transfer	ME 3248
System Dynamics	ME 3234

3. If the student is deemed to be deficient in one or more areas, then he/she must eliminate the deficiency through formal course work during his/her graduate studies. The respective courses for each of the subject areas are listed above. Mechanical Engineering course numbers below 5000 will not receive graduate credit and are not ordinarily included as part of tuition scholarship awards. The student will be informed to any apparent deficiencies in background at the time he/she is notified of a favorable admission decision.

4. Students should have a minimum of 3.0/4.0 grade point average (GPA) overall, in the last two years of undergraduate study and in their major field.
5. Students for who English is not the primary language must take the Test of English as a Foreign Language (TOEFL) examination. A minimum score of 570 is required. The computer-based acceptable score is 230 and 88 on the IBT (internet-based test) are acceptable minimums. Admission to the program is competitive. It is required by the above criteria and by available financial support and positions in laboratories.

B. Master of Engineering (M.Eng) Program

Students must have a Bachelor's degree in science or engineering or have senior status at Vanderbilt University. A minimum GPA is 3.0 for admission and, in some cases, professional experience will be allowed to supplement grade point averages that are below 3.0.

C. Dual Degree Programs

Students who seek entry into dual degree programs, such as the M.D./M.S. program, must apply separately to both programs and be admitted to both programs. Up to six hours of transfer credit are allowed for the M.S.

D. Doctor of Philosophy (Ph.D.) Program

The admission committee judge acceptance into the Ph.D. Program by the criteria outlined below. Completion of the requirements alone does not automatically lead to admission to the Ph.D. Program. Such admission is competitive based on:

1. Undergraduate preparation and TOEFL scores as outlined for the Master's degree.
2. Evidence of potential for research as, e.g., exemplified by grades in previous courses, completion of M.S. thesis research and experience. Students may apply for admission to the Ph.D. Program before completing M.S. thesis research. If planning to continue beyond the Master's degree, the student must submit the Request to Pursue a Ph.D. Degree form to the Director of Graduate Studies. It is strongly suggested that this submission be accomplished no later than four weeks prior to the M.S. final public oral examination. The student will be informed of the outcome of this request. Admission to the program is competitive. It is restricted by the above criteria and by available financial support and positions in the labs.
3. Exceptional applicants can apply to the Ph.D. program without having a Master's degree.

III. Student Guidance, Advising, and Committees

A. Advisor

A student entering the Mechanical Engineering program will be assigned an advisor to assist in registering for the first semester.

B. Research, Project or Thesis Advisor (Major Professor)

During the first semester of residence, the student will select a thesis or project advisor. This selection is by mutual consent of the advisor and student.

C. Thesis and Dissertation Committees

The student, with the advice of the advisor, will select additional members of the faculty to serve on the thesis or dissertation committee. The thesis or project advisor is the Chair of this committee. A total of three members are required for a Master of Science Committee. A Ph.D. dissertation committee is composed of five or more faculty members from the Graduate Faculty, one of which must be from outside the department. Please consult the faculty registry to determine if a faculty member is part of the Graduate Faculty:

<https://www.vanderbilt.edu/faculty-affairs/faculty-registry>.

D. The student's advisor shall nominate this committee and forward the nomination to the Director of Graduate Studies.

E. Plan of Study

During the first semester of residence, the student must prepare a Plan of Study. The research advisor and the Director of Graduate Studies must approve the Plan of Study. A copy of the approved Plan of Study must be on file in the Mechanical Engineering Graduate Office before the start of the second semester residence.

IV. Degree Requirements

A. Master of Engineering

The Masters of Engineering (M.Eng.) degree is a non-thesis Masters program that comprises 30 hours of didactic coursework and a design project supervised by a faculty member. A maximum period of 7 years is allowed to complete the degree.

DIDACTIC COURSEWORK.

The M.Eng. program requires a minimum of 30 hours of didactic coursework at the graduate level (at, or above, the 5000 level). At least 9 of the 24 hours must be in the major area (within ME). A maximum of 6 hours in independent study may be included in the 24-hour requirement.

A maximum of 6 semester hours of transfer credit may be applied toward the M.Eng. degree. Only those hours in which the student has achieved the grade B or better will be considered. Credits must have been earned within 10 years of matriculation to be eligible for transfer. Pass/fail and audited credits are not allowed for transfer. Grades earned on transferred credit do not affect the student's GPA unless such courses are transferred as quality hours. Transfer is made only on the recommendation of the chair or director of graduate studies of the major department and approval of the Graduate School.

PROJECT

All Master of Engineering students are required to complete a design project

under the supervision of a faculty project advisor. Successful completion of the design project requires submission of a final design in a written report to the advisor and final approval from said advisor. It is the student's responsibility to find an advisor to work under.

B. Master of Science

The M.S. degree has two options. Option 1 (M.S. w/ thesis): 24 hours of graduate-level formal, didactic coursework (5000 level or higher) and at least 6 credit hours of research coursework (ME 7999). This option requires candidates to write, and defend, a master's thesis. Option 2 (M.S. non-thesis): 30 hours of graduate-level formal, didactic coursework (5000 level or higher).

RESPONSIBLE CONDUCT OF RESEARCH (RCR)

Collaborative Institutional Training Initiative (CITI) training and RCRG 6303-6307

REQUIRED COURSES

At least 9 hours of didactic course work, excluding independent study hours, must be taken in the major area (i.e. with ME designation). Up to 6 hours in independent study may be included to satisfied the broader 24 hour (M.S. w/ thesis) or 30 hour (M.S. non-thesis) didactic coursework requirement. A maximum of 6 semester hours of didactic coursework transfer credit can be applied towards the degree and must be approved by the Director of Graduate Studies and the Graduate School.

All M.S. students must select a focus area below and complete 2 of the 3 gateway courses (6 credit hours) in addition to 9 hours of focus elective courses, chosen from the focus area courses listed below. A Masters degree would comprise:

Gateway courses: 6 credit hours

Focus elective courses: 9 credit hours

Electives: 15 credit hours (could include independent study or research coursework if pursuing an M.S. w/ thesis)

Focus Areas

Robotics, Controls, Mechatronics

Gateway Courses (2 required):

1. ME 5236 - Linear Control Theory
2. ME 5280 - Advanced Dynamics
3. ME 5271 - Robotics *OR* ME 8353 - Design of Electromechanical Systems

Focus Elective Courses (9 credit hours required)

*Electives include any gateway courses that go beyond the 6 credit hour gateway requirement.

ME 5259 – Vibrations

ME 5273 - Bio-inspired Robotics
ME 5284 - Modeling and Simulation of Dynamic Systems
ME 8331 – Robotic Manipulators
ME 8351 - Adaptive Control
ME 8352 - Non-linear Control Theory
ME 8359 - Advanced Engineering Vibrations

Aerospace Engineering

Gateway Courses (2 required):

1. ME 5263 – Computational Fluid Dynamics
2. ME 5267 – Aerospace Propulsion *OR* ME 8366 - Combustion
3. ME 5261 – Airplane Aerodynamics *OR* ME 8326 – Gas Dynamics

Focus Elective Courses (9 credit hours required)

*Focus electives include any gateway courses that go beyond the 6 credit hour gateway requirement.

ME 5259 - Vibrations
ME 5264 - Internal Combustion Engines
ME 5275 - Finite Element Analysis
ME 5236 - Linear Control Theory
ME 5251 - Modern Manufacturing Processes
ME 8359 - Advanced Engineering Vibrations

Materials and Sustainable Energy

Gateway Courses (2 required):

1. ME 5265 – Direct Energy Conversion
2. ME 8320 – Statistical Thermodynamics
3. ME 8363 – Conduction and Radiation

Focus Elective Courses (9 credit hours required)

*Focus electives include any gateway courses that go beyond the 6 credit hour gateway requirement.

ME 5251 - Modern Manufacturing Processes
ME 5260 - Energy Conversion
ME 5262 - Environmental Control
ME 8321 - Spectroscopic Methods
ME 8323 - Micro/NanoElectroMechanical Systems
ME 8327 - Energy Conversion Systems
ME 8333 - Topics in Stress Analysis
ME 8348 - Convection Heat Transfer
ME 8364 - Nanophotonic Materials
ME 8365 - Micro/Nano Energy Transport
IMS6310 - Atomic Arrangements in Solids

Nanoscale Engineering

Gateway Courses (2 required):

1. ME 8323 - Micro/NanoElectroMechanical Systems
2. ME 8365 – Micro/Nano Energy Transport
3. ECE 5891 – Nanoscale Innovation and Making (special topics right now)

Focus Elective Courses (9 credit hours required)

*Focus electives include any gateway courses that go beyond the 6 credit hour gateway requirement.

ME 8321 – Spectroscopic Methods

ME 8363 – Conduction and Radiation

ME 8364 – Nanophotonic Materials

IMS 5300 - Imaging Techniques in Nanoscale Engineering

IMS6310 - Atomic Arrangements in Solids

ECE 5284 - Integrated Circuit Technology and Fabrication

ECE 5288 – Optoelectronics

ECE5335 - Fundamentals of Quantum Engineering

EECE 6303 - Nanophotonic Devices

EECE 5275 - Microelectronic Systems

ADVISORY COMMITTEE

The student, with the advice of the advisor, will select additional members of the faculty to serve on the thesis advisory committee. The thesis advisor is the Chair of this committee. The M.S. committee must total three members. Two committee members must be Mechanical Engineering faculty who are also part of the Graduate Faculty. Please consult the faculty registry to determine if a faculty member is part of the Graduate Faculty: <https://www.vanderbilt.edu/faculty-affairs/faculty-registry/>.

THESIS

The thesis is based on work done at Vanderbilt by the student under the supervision of the advisor. Normally at least one journal manuscript is drawn from the thesis and submitted for publication. A suggested thesis organization is provided in Appendix A. The student shall submit copies of his/her thesis to the advisory committee no later than two weeks before the final public oral examination. The copies of the thesis shall be in a final form acceptable for submission to the Graduate School. Format and other requirements are itemized in Guidelines for the Preparation of Theses and Dissertations, available at the Graduate School Website. <https://gradschool.vanderbilt.edu/academics/thesis-dissertation-guidelines/>

FINAL PUBLIC ORAL EXAMINATION

The final public oral examination is an oral defense of the student's thesis presented before the advisory committee and the public. This can be taken a maximum of two times. The student will take this oral examination on the thesis

research no later than two weeks before the end of the term. In fall semesters, such timing for the final examination is not adequate to ensure graduating in December. Not only must the examination be passed, but also the thesis must be corrected for approval, and the approved thesis must be submitted to the Graduate School two weeks before the end of the final exam period. Note that in the spring semester, all of the steps must be completed by the deadline outlined in the graduate school calendar if the student wishes to receive a degree at Commencement.

This examination will be given in two parts. The first part will be a public presentation of the thesis. The second part will be in the form of a question period attended by the advisory committee and invited faculty only.

Students completing the M.S. thesis option shall submit, no later than two weeks before the end of the term, two approved copies of the thesis to the Graduate School office, one copy to the Department office, and on to the advisor. Approval requires at least two signatures on the thesis title page of members of the advisory committee. The candidate shall also furnish an abstract of his/her thesis to the Graduate School office.

C. Master of Science (in passing)

Students in the Ph.D. program can receive a Masters of Science, in passing, provided they have: (1) completed the Preliminary Examination, (2) completed their didactic PhD coursework (outlined in D, below), (3) completed 6 hours of research (ME 8999), and have (4) a peer-reviewed paper, as a result of their research at Vanderbilt, accepted for publication. **Students should apply for an Masters of Science, in passing, as soon as the degree requirements are met.** The Graduate School will not confer M.S. and Ph.D. degrees on the same date.

D. Doctor of Philosophy

The Doctor of Philosophy (Ph.D.) degree comprises 72 hours of coursework. This is in addition to the successful completion of the preliminary and qualification exams, in addition to the completion, and defense, of an acceptable Ph.D. thesis.

COURSEWORK

The Ph.D. program requires 72 hours of coursework. This coursework comprises (1) didactic coursework and (2) research coursework, as described below. A maximum period of 6 years is allowed to complete the degree.

A maximum of 36 semester hours of transfer credit may be applied toward the didactic coursework requirement (see below), research coursework cannot be transferred. Only those hours in which the student has achieved the grade B or better will be considered. Credits must have been earned within 10 years of matriculation to be eligible for transfer. Pass/fail and audited credits are not allowed for transfer. Grades earned on transferred credit do not affect the

student's GPA unless such courses are transferred as quality hours. Transfer is made only on the recommendation of the chair or director of graduate studies of the major department and approval of the Graduate School.

DIDACTIC COURSEWORK.

The Ph.D. program requires a minimum of 24 hours of didactic coursework at the graduate level (at, or above, the 5000 level). At least 9 of the 24 hours, excluding independent study hours, must be in the major area (within ME). A maximum of 6 hours in independent study may be included in the 24-hour requirement.

The primary objective of the course requirements is to ensure that each student completes an appropriately balanced plan that satisfies the need for academic breath as well as sufficient depth in the research area.

RESEARCH COURSEWORK

A maximum of 48 hours of research coursework may be used to reach the 72 hour coursework requirement. Before passing the qualification exam, students should enroll in non-candidate research (ME 8999) and after passing the exam students should enroll in candidate research (ME 9999) until they reach the 72 hour requirement. After reaching this requirement, students should enroll in 0 hours of ME 9999.

The primary objective of the course requirements is to ensure that each student completes an appropriately balanced plan that satisfies the need for academic breath as well as sufficient depth in the research area.

EVIDENCE OF PREPARATION FOR DOCTORAL WORK

Students must pass the program **preliminary examination** in mechanical engineering in order to take the qualifying examinations (**see detailed note on the preliminary examinations in Section D**). The responsibility and authority for the implementation of the Ph.D. preliminary examination rests with the mechanical engineering faculty. Certain portions of this responsibility and associated authority are delegated to the student's advisory committee.

Following passage of the preliminary examination, students must complete a **qualifying examination** consisting of the presentation of the written critical review and dissertation proposal and an oral examination before a dissertation proposal to qualify as a doctoral candidate (**see detailed note on the qualification examinations in Section E**). The dissertation proposal is the focal point of the qualifying examination.

Passage of this examination requires written presentation of an acceptable proposal, and passage of an oral examination on the proposed research. A suggested format is provided in Appendix B. The responsibility and authority for the Ph.D. qualifying examination rests entirely with the student's qualifying

examination committee.

Additional examinations may be required by an individual advisory committee.

ADVISORY COMMITTEE

The student, with the advice of the advisor, will select additional members of the faculty to serve on the thesis advisory committee which will preside over the Qualification Exam and Thesis Defense. The thesis advisor is the Chair of this committee. The Ph.D. committee must total five members. Four of the committee members must be from the Graduate Faculty. Three of these members must be Mechanical Engineering faculty and one must be from outside the department. Please consult the faculty registry to determine if a faculty member is part of the Graduate Faculty: <https://www.vanderbilt.edu/faculty-affairs/faculty-registry/>. Faculty members, or others carrying out research or scholarship from outside universities, may also be appointed to serve on a specific student's Ph.D. committee without being considered for Graduate Faculty status, e.g., a faculty member from outside of Vanderbilt University, a faculty member from a professional school such as law or medicine, or a scientist working in a national laboratory, with the approvals of the director of graduate studies or chair of the student's department and of the Graduate School. The request to appoint someone in this manner must be sent to the Director of Graduate Studies and accompanied by a short letter of justification explaining what expertise this person brings to the student's committee along with a copy of the faculty member's curriculum vitae. Any variation of the committee makeup must be approved by the Graduate School. The committee must be appointed by the Graduate School no less than two weeks before the time the student expects to take the qualifying examination.

RESEARCH AND DISSERTATION

Students must complete original research on a topic approved by the dissertation committee and supervised by a member of the mechanical engineering faculty. The doctoral dissertation must be presented in final written form as prescribed by the Graduate School (see Thesis and Dissertation Guidelines at <https://gradschool.vanderbilt.edu/academics/thesis-dissertation-guidelines>) and approved in writing by the Ph.D. dissertation committee. The Ph.D. committee is responsible for setting the scope and ensuring the quality of the dissertation. A sample outline for the dissertation is presented in Appendix C. The dissertation is due to the Ph.D. committee two weeks before the oral defense.

FINAL PUBLIC ORAL EXAMINATION

Students must defend the dissertation research through successful completion of a final public oral examination, and oral defense of the student's written dissertation before the advisory committee and the public. This can be taken a maximum of two times. In fall semesters, allowing only two weeks between the examination and the end of a term is not adequate to ensure graduating in December. Not only must the examination be passed, but also the dissertation must be corrected for approval, and the approved dissertation must be submitted to the Graduate School

two weeks before the end of the final exam period. Note that in the spring semester, all of these steps must be completed by March 22 or that year if the student wishes to receive a degree at Commencement.

<https://gradschool.vanderbilt.edu/academics/graduation-checklist/>

E. Ph.D. Preliminary Examinations

PURPOSE

The Ph.D. preliminary examination exists to provide assurance that all Ph.D. candidates have sufficient knowledge of fundamental principles in mechanical engineering. Therefore, all Ph.D. students, regardless of prior degree(s) held or date of entry into the Ph.D. program (that is, mid-year enrollees, those without prior ME undergraduate degrees, those with existing Master's degrees, and any other students in the Ph.D. programs) must take the preliminary examination following the same procedure as outlined below.

THE EXAMINATION

Each Ph.D. student will be evaluated at the start of the academic year following one in which they entered the Ph.D. program year (nominally one or two days before the first day of classes for the fall semester). The evaluation will be based on: 1.) performance in course work, 2.) an oral preliminary examination, and 3.) advisor's input on their research accomplishments, abilities, and potential.

- Course performance will be determined by grades and/or instructors' input.
- Generally, each Ph.D. student must choose to undertake one of two oral preliminary examinations, including undergraduate and introductory graduate level material in: 1.) Dynamics and Control, or 2.) Thermal and Fluid Science. There is also an option for altering the exam subject matter for those that do not have undergraduate degrees in Mechanical Engineering. These options are outlined below.

To prepare for the Dynamics, and Control exam, students should be thoroughly versed in undergraduate-level dynamics, system dynamics, and control. Students should also have taken several graduate ME courses during their first year and be prepared for questions on the subject matter in those courses. Examples include ME 5236 (Linear Controls), ME 5280 (Advanced Dynamics of Mechanical Systems). Note that the exam will also include underlying mathematics relevant to this subject area (i.e., that used in the undergraduate courses listed above and the graduate courses you have taken). Note that not all of these classes are offered every year, and not all of those offered necessarily need to be taken by every student.

To prepare for the Thermal and Fluid Science exam, students should be thoroughly versed in undergraduate-level thermodynamics, heat transfer, and fluid mechanics. Students should also have taken several graduate ME courses during

their first year and be prepared for questions on the subject matter in those courses. Examples include ME 8363 (Conduction/Radiation Heat Transfer), ME 8365 (Micro/Nanoscale Energy Transport) and ME 5263 (Computational Fluid Dynamics and Multiphysics Modeling). Note that the exam will also include underlying mathematics relevant to this subject area (i.e., that used in the undergraduate courses listed above and the graduate courses you have taken). Note that not all of these classes are offered every year, and not all of those offered necessarily need to be taken by every student.

Students with undergraduate degrees other than Mechanical Engineering and/or students whose research subject area is largely outside the above-described two subject areas may request separate exams with their advisor's endorsement. In this case, the student must provide the graduate committee with written documentation as to why they feel it necessary to take a separate exam. This letter must include: 1.) the student's academic background and research direction, 2.) a list of at least three subject areas related with mechanical engineering on which the student proposes the exam should be based, and 3.) a list of at least three faculty members who have agreed to administer the examination. Upon approval of the department graduate committee, the exam must be performed within one month of the established schedule as outlined here.

Examination Format

- To begin the exam, each student will be asked to present the research work that he/she has performed at Vanderbilt. This oral presentation should be limited to no more than 10 minutes (strict time limit). Next comes a period of intensive oral questioning, to which the student may respond both verbally and through working out problems on a white board. The full exam will nominally take 1.5 hours.
- Each exam committee will be composed of at least three faculty members with expertise in the subject matter.

After the exam, the committee will discuss the outcome of all the above components and jointly decide whether the student has passed the preliminary examination. There will be three options: 1.) pass the student, 2.) fail the student but give him/her another opportunity to pass with or without conditions, and 3.) fail the student without giving further opportunity to pass. If given a second (last) chance to take the exam, the student must attempt this two business days prior to the start of the immediately following spring semester.

TIMELINE

All students in the Ph.D. program must take their elected preliminary exam at the first opportunity, i.e., during the exam period which is normally two days before fall semester courses begin in the academic year following the one in which they entered the program.

Students entering the Ph.D. program in the spring semester, students entering the

Ph.D. program without a master degree, or students entering the Ph.D. program from a non-mechanical engineering undergraduate major must follow the same schedule outlined above. However, note that faculty will weigh the preparation of the student prior to their start of graduate work in the Vanderbilt Mechanical Engineering Department on a case by case basis during the oral exam (question will be adjusted appropriately), and in making final decisions on the exam. Students with undergraduate degrees other than in mechanical engineering should consult with their advisor on how to prepare for the undergraduate ME subject matter, as far in advance of the exam as possible. Failure to follow the strict timeline outlined above will be grounds for suspension of pay and/or dismissal from the graduate school.

F. Ph.D. Qualifying Examinations

PURPOSE

Passage of a qualifying examination (“research proposal”) given by the Ph.D. advisory committee is required for admission to candidacy. The purpose of the exam is to ensure that the student has the competency and knowledge required to complete their dissertation and to propose the remaining work required that will comprise the dissertation.

In both the written and oral qualifying examination, the student should:

- Demonstrate competency with fundamentals in areas that required remedial action as a result of the preliminary examination.
- Demonstrate in-depth knowledge of subject matter related to the dissertation topic.
- Propose research projects that will complete their dissertation.

THE EXAMINATION

The qualifying examination consists of a written dissertation proposal and an oral defense of the proposal. The written document must be provided to the advisory committee a minimum of two weeks prior to the examination and contain a reasonable research plan and demonstration of original work in the area of the dissertation. The oral exam must be completed in person, allowing exceptions for external committee members to join remotely. The qualifying exam can be taken a maximum of two times.

TIMELINE

A student, by Graduate School rule, must complete the 24 hours of required didactic coursework before applying to take the qualifying examination. The exam should be taken within 4 years of entering graduate school, **scheduling the exam is the student’s responsibility** but should be done with the approval of the research advisor. If the exam cannot be taken within the first 4 years then an

extension request must be submitted to the DGS.

G. Special Notes, M.S. and Ph.D. Programs

Courses in the following categories may be necessary as background for graduate students but cannot count toward degree requirements:

- Any course required for the Bachelor's degree in mechanical engineering
- Any course not approved as appropriate in level by the Director of Graduate Studies

H. Registration Responsibility

Students are required to officially register for the fall and spring semesters, even if all course and semester hour requirements have been met, unless an approved leave of absence has been secured from the Dean of the Graduate School.

Responsibility to maintain this registration rests with the student. Student status in the Graduate School ceases with failure to register. Most students should also register in the summer session for thesis or dissertation research (ME 7999, ME 8999, or ME 9999), but credit will not ordinarily be allowed during the summer session. See Appendix F for Course Registration Sample.

V. Student Performance and Evaluation

Graduate and professional student progress toward a degree in mechanical engineering is evaluated several times each year. Measures include grades, quality of work by teaching assistants, various examinations, and progress towards research objectives, publications, theses and dissertations. Students are also subject to time limitations explained below.

A. Grade Point Average and Research Grades

All graduate students must maintain at least a 3.0 average overall. A student is considered on probation following a semester in which the average falls below 3.0 or in which a grade is less than "C" has been received. If the 3.0 average is not regained at the end of the probationary semester, the student will be encouraged to withdraw. The student must have an overall 3.0 average to graduate.

Grades of satisfactory (S), low pass (LP), and unsatisfactory (U) are available for research courses (7999, 8999, and 9999). S/LP/U grades are given every semester for all research courses, regardless of the number of hours registered. The accumulation of three (3) U or LP grades over the course of study can lead to dismissal from the program and the Graduate School. No credit will be granted for courses in which a grade of U is received.

B. Time Limits

All requirements for the M.S. degree must be completed within the six years following the student's entrance to the program. For the M.Eng. Degree, completion must occur within seven years. All Ph.D. work must be finished within 4 years of passing the qualifying examination. The qualifying exam should be at least 6 months before the Final Defense. See Appendix G for a timeline table.

C. Financial Aid

Financial aid is awarded as available to encourage highly qualified students to pursue graduate study. Aid can take the forms of partial tuition award, full tuition award, full tuition plus service-free stipend (see Appendix D). The following criteria are used for awards:

- Scientific and professional promise of student as exemplified by past performance in course work, standard examinations and research or other relevant experience.
- Preparation of the student. Students needing remedial course work receive lower priorities.

D. Requirements For Students With Stipends

Graduate students supported by fellowships, stipends, or salaries during the academic year are expected to devote full time to their graduate studies, which are normally divided between coursework and research. Teaching Assistants have teaching responsibilities as well. Research Assistants and Space Grant Trainees or Fellows with full course loads are expected to spend 20 hrs/wk on research during the academic year. The number of hours is expected to increase to 40 hrs/wk as didactic coursework is replaced with research hours (ME 7999, 8999, or 9999). Teaching Assistants should expect to spend as much as 20 hrs/wk on assigned teaching duties. Summer stipends may be awarded separately each spring as required or may be awarded as part of a 12-month support program. Students who receive a summer stipend are expected to work 40 hrs/wk during the summer on their research.

E. Student Offices

Graduate student desk space is assigned by the Graduate Program Coordinator. A professional atmosphere is to be maintained at all times in graduate student office space. Priority for desk space assignments is given to full-time graduate students with either teaching assistantships or research assistantships. You MAY NOT change your assigned desk location with another person or change the configuration of the room without direct permission of the Graduate Program Coordinator.

Students are assigned a workstation in an area where others are working and this could very well be a new experience for some, so a few rules and considerations should be kept in mind:

- Be considerate of your office mates and respect their need for quiet and privacy
- Cell phones WILL be put on vibrate mode and all calls WILL be taken outside the office
- Entertain visitors and meet with classmates or students in other locations such as the Student Lounge on 1B or the meeting room on 3A.
- No visitor will work in office space without permission from the Graduate Program Coordinator
- Refrain from music, protracted telephone conversations and other disturbances
- Warm up foods with strong odors in other locations
- Do not display potentially offensive materials around your personal space.
- Maintain a professional workplace environment and positive, constructive attitude at all times
- Do not put your office mates in the position of having to complain about you
- Upon leaving Vanderbilt, after completing your degree program, clean your study area.

F. Safety Training

Safety training is required of all graduate students receiving teaching and research assistantships or involved in laboratory research. Consult with your advisor as to what training is necessary for your laboratory and make sure that you have completed all safety training **PRIOR** to starting work in the lab.

In the event of having to evacuate the building, the general evacuation procedures from Olin Hall are:

- Exit the building using the nearest stairs.
- Assemble no closer than 50 feet from the building.
- Look out for those who work or are near you, report anyone missing.
- Do not congregate near response units or activities.

Vanderbilt University policy forbids reentry to a building in which an alarm has occurred until authorization by Vanderbilt Security.

G. Student Travel

Students should familiarize themselves with Vanderbilt's Travel Policy located at: <https://finance.vanderbilt.edu/travel/files/VUTravelPolicy.pdf> before booking travel and departing on their trip.

All international travel should follow institutional guidelines and policies as outlined on <https://www.vanderbilt.edu/global/global-safety/>. If traveling internationally, use the International Travel Checklist for planning. The checklist is located at the following link: [International Travel COVID-19 Checklist \(vanderbilt.edu\)](https://www.vanderbilt.edu/global/global-safety/international-travel-checklist/)

Prior to traveling, VUSE business travelers are responsible for ensuring they have the necessary administrative approvals for a trip **PRIOR** to committing university funds. Students are expected to consult with their respective PI, advisors, etc., to get written approval. Students on service-free stipends such as the NSF are sometimes not in the system and must contact Sarah Nagy Miller for assistance.

All airline travel **MUST** be booked in Concur at <http://vu.edu/concur>, by calling World Travel agent at 877-271-9258, or via email at vanderbilt.travel@worldtrav.com. If you think you've found a lower fare online, World Travel Service has a price match guarantee on **identical U.S. domestic flights**. World Travel will match the fare or pay the difference, but you must provide a screenshot or verification in real-time and email it to World Travel. Consolidator and auction websites like Expedia or Travelocity are not included. **You MUST book airline travel through Concur or World Travel. If you book travel outside of CONCUR/World Travel, you will NOT get refunded for the expense.**

Please contact a World Travel agent when making **complex domestic air or any international air reservations**, and when changing existing, ticketed reservations by calling between the hours of 7:00 a.m. – 6:00 p.m. Central Time.

- 877-271-9258 for World Travel agent assistance
- For after hours or emergency assistance, please call: 865-777-1600

Students may apply for travel grants through the Graduate Student Council at: <https://studentorg.vanderbilt.edu/gsc/travel-funding-request/>

If you have questions about Concur, please email concurexpense@vanderbilt.edu

CREATING YOUR CONCUR PROFILE **INITIAL ACTIONS REQUIRED**

- A profile is necessary to do or book anything in Concur.
Create a personal profile by visiting--

<https://www.vanderbilt.edu/skyvu/> and click on the Concur icon.

- Make sure that your name in the profile matches the name listed in your government issued identification that you use when traveling for TSA purposes (e.g. passport, driver's license).
- DO NOT add bank account information in Concur. Vanderbilt travelers are now reimbursed via Oracle Expense.
- Fill in:
 - Date of birth
 - Gender
 - Personal credit card number to book hotels and rental cars
 - Add other optional information:
 - **Personal travel preferences (e.g. aisle or window seat, type of hotel room and rental car)**
 - **Any travel-related loyalty programs**

TRAVEL PROCESS

- Consult with your advisor and get written approval. Approval must include description of event with reason, dates, location, funding amount, and project number. Send PI approval prior to trip to megrants@vanderbilt.edu to receive funding approval.
- Book air travel using Concur by accessing the link:
 - <https://www.vanderbilt.edu/skyvu/>
- Complete your expense report via Oracle at <https://www.vanderbilt.edu/skyvu/> and go to the Oracle Cloud login, then go to "About Me" and choose "Expenses". If you need assistance completing the report, use the Wizard in Oracle and it will walk you through the process. Reach out to Sarah Nagy Miller at if you have questions.

Expense reports that do not follow format and/or Vanderbilt University Travel Policy guidelines will be returned for compliance. If students have questions or need further clarification, they should contact Sarah Nagy Miller at sarah.nagy@vanderbilt.edu or Myrtle Daniels at myrtle.l.daniels@Vanderbilt.Edu.

H. Purchase Requisitions

These procedures are for the benefit and protection of all who use University funds. Incomplete information and/or non-standard practices cause problems in the University business accounting systems, resulting in delays, mistakes, or incorrect charges.

If you are ordering anything, please complete the Purchase request form, get PI approval, and then submit via email to meordering@vanderbilt.edu. If possible, orders should be started in Oracle and then reassigned to Myrtle Daniels for further processing in addition to sending the Purchase Request form and approval

to meordering@vanderbilt.edu.

The following steps apply to all members of Mechanical Engineering. Prior signature approval is required for ALL expenditures. Individuals who initiate purchases or other obligations without proper authorization and documentation assume responsibility for meeting those obligations.

1. Prepare a ME department purchase request form, giving complete information. The Business Purpose must be included.
2. Prepare a separate form for each vendor. All Purchase forms must have a Business Purpose detailing the need. Include a complete description of item(s), model number, price, quantity, and any other information that might be helpful for the transaction. Indicate added costs such as handling, shipping, or postage, etc. If the request is for equipment or other large expenditures, several quotations and other information may be necessary, as required by the Department or University.
3. Obtain principal investigator approval and signature. Incomplete request cannot be processed. For expenditures of ME Department funds, the chairman's approval must be obtained before requests are processed.
4. Approved, completed ME Department Purchase Request Forms should be emailed to meordering@vanderbilt.edu. Note that requests for large purchases must cross several desks and/or may need several signatures before a purchase order is issued. Therefore, please do not expect immediate results. The normal turnaround is 3 business days. If it is urgent, enter URGENT into the subject title and every attempt will be made to expedite the process.
5. Verify receipt of received goods. Email meordering@vanderbilt.edu if there is an issue. Unless informed otherwise, Accounts Payable presumes all orders have been received.
6. If return of materials is necessary, a RMA & center number will be needed. Do not return anything without contacting meordering@vanderbilt.edu for instructions.
7. If you need assistance with the above procedures, or if you have questions, please contact Myrtle at 615-322-2431 or email meordering@vanderbilt.edu. See Appendix E for samples of Purchase Request Form.

I. Laboratory Safety, Courtesy and Rules

You are expected to maintain your lab area and other assigned workspace in a neat and orderly manner. You are one of the primary persons responsible for the safe operation of your experimental equipment. This effort will assist our facilities are operated in a safe manner and will help you in achieving meaningful experimental results.

Laboratory Safety

Much of the equipment and a number of our experiments are hazardous, operations can be conducted only when you have a partner in the lab. During regular working hours your lab door should be open and someone nearby should be informed of your activity.

Evenings, weekend and holidays operations of hazardous experiments and equipment are permitted, if two persons are available in the immediate area and must be on the same floor. Thoughtful analysis and judgment cannot be replaced by the rules. Many hazardous operations such as handling liquid metals, rolling mill, glass melting, laser operations, and lathe and mill operation require adherence to the buddy system described above. Students who wish to use the machine shop must complete safety training with Dr. Thomas Withrow. Safety questions should be discussed with your faculty advisor before a hazard becomes an accident.

Chemical and toxic gas should not be used until you become familiar with its properties, hazards and the handling precautions that are necessary. See *Dangerous Properties of Industrial Materials* by Sax, for a quick source of information. Disposal of some chemicals in laboratory sinks is prohibited by both the state and federal legislation. It is your responsibility to identify such chemical disposal procedures. If you have questions contact your advisor, or Vanderbilt's Environmental Health and Safety Office at 2-2057.

J. Vacation Policy

Graduate Student Holidays

Graduate student holidays will follow the University Staff Holiday Schedule with the exception that they must report on Labor Day due to classes being in session. Please note that the staff holiday schedule is different than the undergraduate term dates and holidays. There may be certain situations where graduate students have to perform assistantship duties on a university holiday, such as performing time-sensitive experiments that cannot be delayed. In those situations, those graduate students are entitled to take another day off in place of that holiday, and they should coordinate with their research advisor on the timing.

Holidays included (see the University holiday calendar for the specific days off each year: <https://hr.vanderbilt.edu/holiday-calendar.php>)

New Years Day
Martin Luther King Day
Memorial Day
Juneteenth
Independence Day
Thanksgiving Day + day after Thanksgiving
Winter Break

Additional Paid Time Off for Research Assistants

Research assistants may take up to an additional 10 weekdays off per year (August to July) with approval of their research adviser. Time off for holidays, as listed above, does not count towards the allotted time off.

K. Additional Employment

All students receiving aid agree to hold no other employment during the period for which aid is given. Students cannot accept 'extra' jobs for pay within or outside the University unless prior approval is given by the major advisor and Director of Graduate Studies. Supplementation in this way may be allowed for university work related to training in mechanical engineering, but students must have prior approval. If you receive permission to accept additional employment you must notify the Graduate Education Coordinator.

Engagement in outside employment or failure to obtain approval for University employment may result in loss of financial aid.

L. Important Web Links

The following links provide a wealth of information relevant to graduate student life at Vanderbilt University and the Nashville Community.

Graduate School Academic Forms

https://gradschool.vanderbilt.edu/academics/forms_timeline.php

Graduate School Thesis & Dissertation Guidelines

<https://gradschool.vanderbilt.edu/academics/thesis-dissertation-guidelines/>

Graduate School Catalog

<https://www.vanderbilt.edu/catalogs/kuali/graduate.php#/content/60a6a417ea6be3001cfbdde1>

International Tax (Glacier) <http://www.online-tax.net>

Student Health Center <https://medschool.vanderbilt.edu/student-health/>

Graduate Student Council <http://studentorg.vanderbilt.edu/gsc/>

Vanderbilt University Environmental Health and Safety

<https://safety.vanderbilt.edu/>

Vanderbilt University Graduate School Academic Calendar (Important Dates)

<https://gradschool.vanderbilt.edu/academics/calendar-23-24.php>

<https://registrar.vanderbilt.edu/calendars/2023-24.php>

Vanderbilt University Office of Student Accounts
<http://www.vanderbilt.edu/stuaccts/>

Vanderbilt University People Finder
https://it.vanderbilt.edu/services/directory/directory_services.php

Vanderbilt University Police Department <http://police.vanderbilt.edu/>

Vanderbilt University and Vicinity Map <http://www.vanderbilt.edu/map>

Appendix A

Suggested Table of Contents for M.S. Thesis

SIGNED TITLE PAGE

ACKNOWLEDGEMENTS

LIST OF FIGURES

LIST OF TABLES

NOMENCLATURE

Chapter I. INTRODUCTION AND SUMMARY

This section is a broad introduction to the research topic, a summary of the findings of the thesis, and an outline for the text that follows.

II. ENGINEERING MODELS FOR ENGINE COMBUSTION

This section contains a critical review of the pertinent literature.

III. DESIGN AND RESULTS OF ENGINE TEST

How any experiments were designed, and the results of the measurements are itemized here.

IV. MODEL FOR PRACTICAL COMBUSTORS

In this section the model development during this thesis effort is derived and validated with the test results presented in section III.

VI. CONCLUSIONS AND FUTURE EFFORTS

Here the specific conclusions and recommendations for future work are provided and explained.

APPENDICES

These may include detailed preliminary data, essential theoretical derivations, essential calibrations, details of algorithm, examples, modifications to experimental apparatus, etc. Appendices are supplemental material, included for clarification. They may not be used to circumvent page limitations.

A. LISTING OF ENGINE DATA

This could be a tabular listing of the measured results. It would have a brief introduction so that it stands alone.

B. PARAMETERS CALCUALTED FOR THE MODEL

Here intermediate calculated properties or model results would be listed. Again, an introduction would clarify what is included for the reader.

REFERENCES

Harvard name and date is the simplest way to cite and list references in a major written undertaking such as a M.S. thesis.

Appendix B

Suggested Table of Contents for Ph.D. Proposal

TITLE PAGE

ACKNOWLEDGEMENTS

LIST OF FIGURES

LIST OF TABLES

NOMENCALTURE

ABSTRACT (1-2 pages)

Chapter I. INTRODUCTION AND SUMMARY

This section is a broad introduction to the research topic, a summary of the proposed research and plan, and an outline for the text that follows.

II. BACKGROUND AND SIGNIFICANCE

This section contains a critical review of the pertinent literature and thus places the proposed research perspective.

III. PRELIMINARY STUDIES

Here work accomplished to date on both model and experiment is presented. The intent is to demonstrate that the research is feasible and underway. Preliminary conclusions should be drawn from the work discussed.

IV. RESEARCH PLAN

This section is an explanation of the envisioned work that remains with an estimated schedule for completion.

V. REFERENCES

Harvard name and date is the simplest way to cite and list reference in a major written undertaking such as a Ph.D. proposal.

APPENDICES

These may include detailed preliminary data, essential theoretical derivations, essential calibrations, details of algorithm, examples, modifications to experimental apparatus, etc.

Appendix C

Suggested Table of Contents for Ph.D. Dissertation

SIGNED TITLE PAGE

ACKNOWLEDGEMENTS

LIST OF FIGURES

LIST OF TABLES

NOMENCALTURE

Chapter I. INTRODUCTION AND SUMMARY

This section is a broad introduction to the research topic, a summary of the findings of the dissertation, and an outline of the text that follows.

II. ENGINEERING MODELS FOR ENGINE COMBUSTION

This section contains a critical review of the pertinent literature.

III. DESIGN AND RESULTS OF ENGINE TESTS

This section indicates how any experiments were designed and the results of the measurements.

IV. DERIVATION AND VALIDATION OF RESULTS

In this section the model developed during this dissertation effort is derived and validated with the test results in section III.

VI. CONCLUSIONS AND FUTURE EFFORTS

Here the specific conclusions and recommendations for future work are provided and explained.

APPENDICES

These may include detailed preliminary data, essential theoretical derivations, essential, calibrations, and details of an algorithm. Examples, modifications to experimental apparatus, etc. Appendices are supplemental materials, included for clarification. They may not be used to circumvent page limitations.

A. LISTING OF ENGINE DATA

This could be a tabular listing of the measured results. It would have a brief introduction so that it stands alone.

B. PARAMETERS CALCULATED FOR THE MODEL

Here intermediate calculated properties or model results would be listed. Again, an introduction would clarify what is included for the reader.

REFERENCES

Harvard name and date is the simplest way to cite and list references in a major written undertaking such as a Ph.D. dissertation.

Appendix D

What You Should Know About Financial Aid

- A. **General Information.** Some financial matters are the same for all students. They are as follows:
- All students must carry health insurance. If covered by parents/spouse or other entity, you must waive automatic insurance enrollment by providing proof of coverage to the Office of Student Accounts. Otherwise, you will be enrolled for the University's student health insurance. The only exception is if you are a part-time graduate student (registered for 4 or fewer hours of regular coursework). This exception does not apply to full-time students who have completed their course requirements and are registering for the '0' hours.
 - If you are to graduate at the end of the fall semester (December) you will need to waive your insurance from Vanderbilt and seek alternative insurance for the final four months. If your insurance is paid by the department or by your advisor you will be reimbursed for the alternative insurance coverage. You must waive the University insurance by August 1st and present a copy of the waiver confirmation to the Graduate Office so this information is on file. Failure to waive the insurance will result in you being responsible for the cost of the insurance plan. Remember the University plan covers the entire fiscal year and it will be the student's responsibility to pay for the plan if there is a failure to comply with the waiver of the plan.
 - All students must pay an activity fee each semester, including summer, unless they are classified as part-time or reside outside a predetermined zip code range and area 50 miles from Vanderbilt University. The School of Engineering will pay the Activity/Rec fee for all graduate students who are supported as a teaching assistant or research assistant.
 - All students must have a signed Student Account and Deferral Agreement Form on file in Student Accounts.
 - No matter what type of tuition scholarship award you receive you will be billed personally for it. Please pay attention to Student Account statements and monitor them for accuracy. Bring discrepancies to the attention of the Graduate Education Coordinator or Student Accounts.
 - All students must fill out a Registration Data Form each semester and send a confirmation copy by email to the Graduate Education Coordinator or they will be dropped automatically from the Graduate School.
 - All students who have been notified of a Financial Hold on their student account must work with Student Accounts and/or the department to resolve whatever the issues are. Students should not assume that the matter will simply resolve itself.
 - Students must notify the Director of Graduate Studies and the department Education Coordinator of any changes in the number of hours for which they wish to be enrolled for

each semester.

B. Financial Aid Types. There are four types of financial aid. Each type impacts the student in a different manner.

- Tuition Only, Full and Partial. These are tuition scholarships that are not considered taxable compensation to the student. They will be paid directly by the department. They do not provide stipend and do not cover insurance or activity fees.
- Teaching Assistantships. Teaching assistants are paid a monthly taxable stipend (determined by the Department Chair and the Graduate Committee) and receive a tax- free full tuition scholarship paid directly by the department. A teaching assistant may be offered insurance coverage as part of the award. This is determined by the Graduate Committee and is included as part of the graduate admission offer. Also, there may be partial teaching assistantships whose stipend and tuition scholarships are reduced accordingly. This is also determined by the Graduate Committee and is included as part of the admission offer.
- Research Assistantships. Research assistants are paid a monthly taxable salary (determined by the principal investigator of the funding source) and typically receive a full tuition scholarship, a portion of which will be treated as taxable compensation to the student. Typically, research assistants' salaries are greater than those for teaching assistants, partly to compensate for a larger tax burden.
- Service-free Traineeships/Fellowships. Taxes are not withheld from the stipends paid from these awards; however, the University's position is that the stipends may be taxable. It is the responsibility of the student to determine taxability through consultations with Internal Revenue Service or a tax accountant. Typically, these awards provide a 100% tax-free tuition scholarship (a combination of tuition awarded from the funding source and the department). Most provide the cost of health insurance (the Vanderbilt student health plan), if needed, and some will pay activity and audit fees. This will vary with the funding source. A student offered a service- free traineeship or fellowship will be notified in the offer letter which fees are covered.

Appendix E

BASIC Mechanical Engineering Purchase Order Request

Requested By:		Date Needed by (not ASAP):		Today's Date:	
PI/Faculty Name:		Room to be delivered to:			
Project Number:		Item Type (lab supplies, etc.):			
Vendor:		Total # Items for order:			
Address:		Total Order Amount:			
City:			Please choose purchase type from the list below:		
State:		Zip:		New Vendor Purchase	Amazon Wishlist Sent
Phone:		Fax:		Computer Software	Oracle PO Reassigned
Email/website:			Equipment over > \$5,000?		
Please give a brief explanation as to how this purchase relates to your project:					
By signing this form I am verifying that the Date of Charge is within the budget period of the project, the cost center is active, the account number is correct and activated on the system, prior authorization has been obtained, the cost is a reasonable direct charge to the project, allocable to the project, consistent with Vanderbilt Guidelines and allowable according to applicable regulations. This allows our faculty and students to more fully use our CAD software, CREO.					
Faculty Approval: _____ Date: _____ (Required)					
Item	Quantity	Part#	Description	Price	Amount

***Review before submitting Capital PO Req**

If you are unsure of the following questions -or if the answer is "YES", have your PI check with our Grants Management Team before submitting this PO.

Will this purchase be on a project? (Y/N):	
Is the price listed in anything other than US Dollars? (Y/N)	
Is your lab building this for a customer? (Y/N)	
Will additional parts be purchased and added to this item? (Y/N)	
Total price/quote for \$5K or more for the item itself (excluding travel/labor)? (Y/N)	
Is this a component to be added to a larger item? (Y/N)	

You may proceed to fill out the ME Fabricated Equipment PO Request (next page) only if:

- The total item price is \$5K or more once assembled (excluding travel, labor, etc.)
- The purchased items are to be used only at Vanderbilt
- Asset has a reasonably certain completion date

ME Capital Equipment PO Request

Requested By:		Today's Date:			
PI/Faculty Name:		Date Needed by (not ASAP):			
Project Number:		Item Type (lab supplies, etc.):			
Vendor:		Total # Items for order:			
Address:					
City:					
State:		Zip:			
Phone:		Fax:	*Be sure to attach quote to this request*		
Email/website:					
Please give a brief explanation as to how this purchase relates to your project: (Example: This allows our faculty and students to more fully use our CAD software, CREO.) 					
By signing this form I am verifying that the Date of Charge is within the budget period of the project, the cost center is active, the account number is correct and activated on the system, prior authorization has been obtained, the cost is a reasonable direct charge to the project, allocable to the project, consistent with Vanderbilt Guidelines and allowable according to applicable regulations.					
Faculty Approval (Required): _____ Date: _____					
Item	Quantity	Part#	Description	Price	Amount

***Review before submitting Fabricated/Capital PO Req**

If you are unsure of the following questions -or if the answer is "YES", have your PI check with our Grants Management Team before submitting this PO.

Will this purchase be on a project? (Y/N):	
Is the price listed in anything other than US Dollars? (Y/N)	
Is your lab building this for a customer? (Y/N)	
Will additional parts be purchased and added to this item? (Y/N)	
Total price/quote for \$5K or more for the item itself (excluding travel/labor)? (Y/N)	
Is this a component to be added to a larger item? (Y/N)	

You may proceed to fill out the ME Fabricated Equipment PO Request (next page) only if:

- Your PI has confirmed this purchase is for Fabricated equipment **and you have a Tag #**
- The total item price is \$5K or more once assembled (excluding travel, labor, etc.)
- The purchased items are to be used only at Vanderbilt
- Asset has a reasonably certain completion date

ME Fabricated/Capital Equipment PO Request

Requested By:		Today's Date:	
PI/Faculty Name:		Date Needed by (not ASAP):	
Project Number:		Item Type (lab supplies, etc.):	
Vendor:		Total # Items for order:	
Address:			
City:			
State:		Zip:	
Phone:		Fax:	
Email/website:			
Fabricated Tag #: *Be sure to attach quote to this request*			
Please give a brief explanation as to how this purchase relates to your project: (Example: This allows our faculty and students to more fully use our CAD software, CREO.)			
By signing this form I am verifying that the Date of Charge is within the budget period of the project, the cost center is active, the account number is correct and activated on the system, prior authorization has been obtained, the cost is a reasonable direct charge to the project, allocable to the project, consistent with Vanderbilt Guidelines and allowable according to applicable regulations.			
Faculty Approval (Required): _____		Date: _____	

Item	Quantity	Part#	Description	Price	Amount

Mechanical Engineering FedEx Shipment Request

Requested By:		Today's Date:	
PI/Faculty Name:		Weight of package:	
Project Number:		Declared Value of package:	
Company Name:		Expected delivery date:	
Contact Name:		Signature required?	
Address 1:		Schedule a pickup or are you dropping off at FedEx?	
Address 2:		Pickup: ☐ Drop Off: ☐	
City:		Will you continue to ship items to this person/address?	
State:		Yes: ☐ No: ☐	
Zip:		Type of Package:	FedEx Box: ☐ FedEx Envelope: ☐ Your Own: ☐
Phone:		If using your own package, provide box dimensions: (Length/Width/Height)	
Special instructions:		*For international shipments* Please give a brief description of the item/s:	

Appendix F

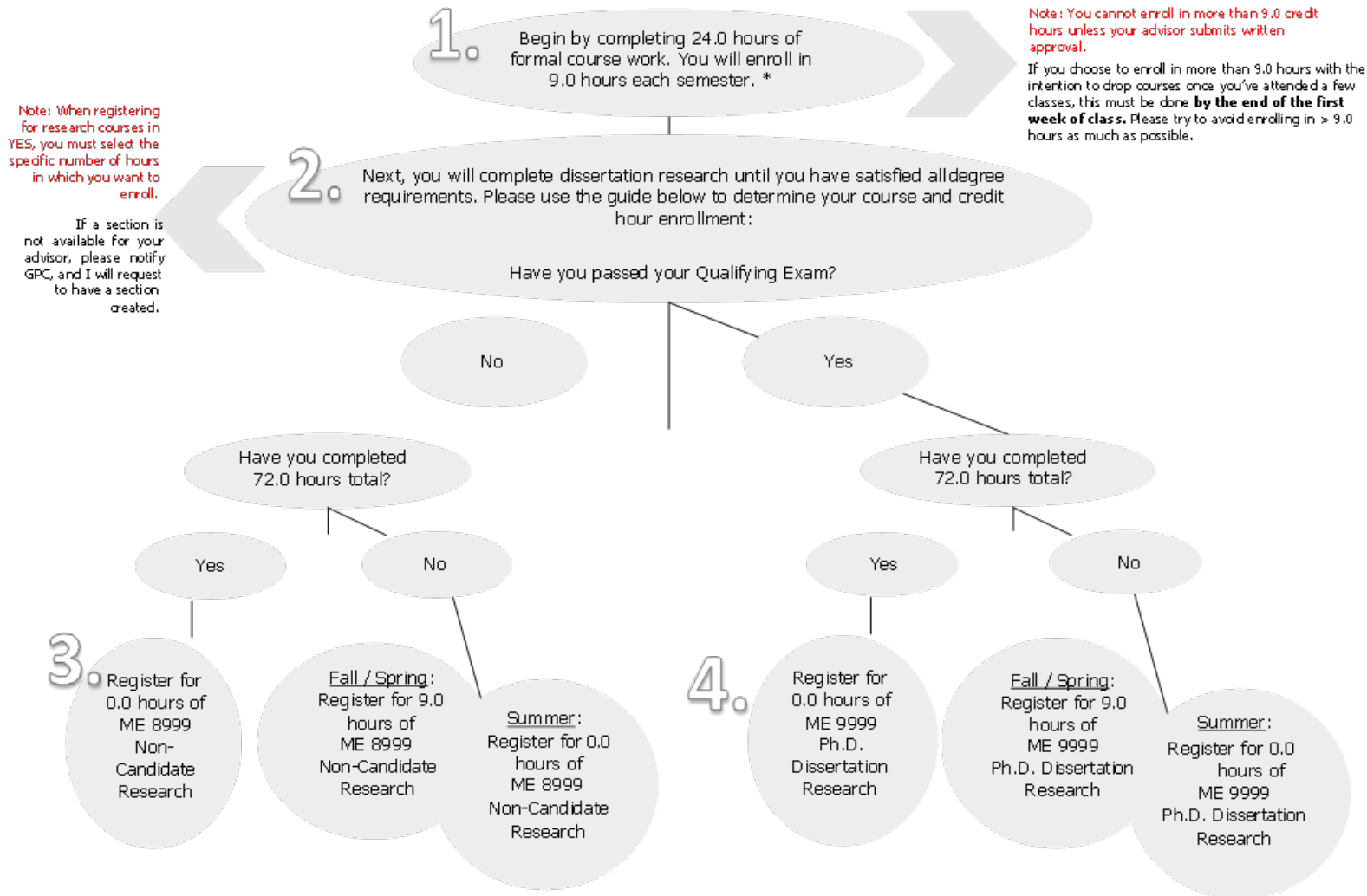
Course Registration for PhD Program

- You must be enrolled in 9.0 credit hours each semester (excluding summer term) until you have completed 72.0 hours total.
- When selecting courses in Step 1 below, please discuss with your advisor a to help determine your registration.

Appendix F

Course Registration for PhD Program

- You must be enrolled in 9.0 credit hours each semester (excluding summer term) until you have completed 72.0 hours total.
- When selecting courses in Step 1 below, please discuss with your advisor a to help determine your registration.



*Note: In most cases you will take research hours before completing 24 hours of formal course work. For example, the following or similar is typically:

- a. 1st semester: 3 courses (9hrs)
- b. 2nd semester: 2 courses (6hrs) + 3hrs research (ME8999)
- c. 3rd semester: 2 courses (6hrs) + 3hrs research (ME8999)
- d. 4th semester: 1 course (3hrs) + 6hrs research (ME8999)
- e. 5th semester on: 9hrs research (ME8999 and eventually ME9999)

Appendix G

Overview of forms and Graduation Information

Important Events and Academic Forms

Approximate Deadlines

Master of Science Degree

Form Thesis Committee	At least 2 months before thesis presentation.
Schedule Thesis Presentation	At least 2 weeks before the presentation.
Thesis Presentation (Thesis Guidelines)	Pay close attention to graduation deadlines.
Completion of Master's Degree	Pay close attention to graduation deadlines.

➤ [Intent to graduate guide](#). For more M.S. forms, please click [HERE](#).

Ph.D. Program

Preliminary Examination	1 year after admission.
Completion of Master's Degree	A "Masters in-passing" is awarded after: 1) passing the prelims, 2) publishing a first author journal paper, and 3) satisfying MS credit hours.
Form PhD Committee	At least 1 month before scheduling proposal.
Request to schedule qualifying exam (proposal)	The qualifying exam must be scheduled and passed within four years of being admitted to the program.
Submit qualifying exam results (proposal result)	
Request to schedule dissertation defense	Pay close attention to graduation deadlines.
Submit dissertation defense results	Pay close attention to graduation deadlines.

➤ [Intent to graduate guide](#). For more Ph.D. forms, please click [HERE](#).

Other important links:

- Thesis & Dissertation information and Submission details can be found [HERE](#).

You may view the Checklist for Graduation provided by Vanderbilt [HERE](#).

Important questions to ask your advisor: Please inform the Graduate Program Coordinator of the answers to these questions well before the submission deadline.

This is important to avoid a bill for tuition and/or health insurance.

- Will you continue to be paid as an RA until you graduate? Y or N
- Has your advisor agreed to cover your tuition until you graduate? Y or N
- Has your advisor agreed to cover your Health Insurance until you graduate? Y or N