

# CIVIL AND SYSTEMS ENGINEERING, PHD

<https://engineering.jhu.edu/case/>

The PhD program at the Johns Hopkins University Department of Civil and Systems Engineering (<https://engineering.jhu.edu/case/graduate-programs/phd-program/>) aims to inspire the leaders of tomorrow to take on the challenge of creating and sustaining engineered systems that underpin our society, from the built environment to public health systems. Our graduate students work with faculty members who are world-renowned leaders in their fields and contribute to research that has a tremendous impact on society. The graduate program focuses on three fundamental areas of Structural Engineering, Mechanics of Materials, and Systems Engineering. Examples of current projects include fracture and fatigue in materials and structural systems, design of additively manufactured architected materials, earthquake engineering, and applying systems approaches to improving patient flow in hospitals and predicting virus outbreak.

Students graduate from the program with a sense of the responsibility that the civil and systems engineering profession accepts for applying the principles of engineering sciences for the betterment of the built environment and society. Its graduates have an appreciation of professional ethics and the value of service to their profession and society through participation in technical activities, and in community, state, and national organizations.

Both undergraduates and master's students are encouraged to apply to the PhD program in Civil and Systems Engineering. Once accepted to the program, students can pursue an area of interest in Systems (<https://engineering.jhu.edu/case/research/focus-areas/systems/>), Structures (<https://engineering.jhu.edu/case/research/focus-areas/structures/>), and/or Mechanics of Materials (<https://engineering.jhu.edu/case/research/focus-areas/mechanics-materials/>). Students do not need a civil engineering degree to apply - students from all technical backgrounds are welcome.

## Financial Support

Financial support from the Department of Civil and Systems Engineering for PhD students provides full tuition, health insurance coverage, matriculation fee, and a 12-month stipend for enrollment for the entire duration of the program when PhD students are in a fulltime, resident status.

## Admissions

- Apply online (<https://applygrad.jhu.edu/apply/?sr=9aceddc1-d563-4a68-a7b8-a023986c3cb7>)
- Frequently Asked Questions (<https://engineering.jhu.edu/case/admissions/graduate-programs/graduate-admissions-faqs/>) on the CaSE Admissions page (<https://engineering.jhu.edu/case/admissions/graduate-programs/>)
- Full-Time Engineering Graduate Admissions (<https://engineering.jhu.edu/admissions/graduate-admissions/full-time-programs/how-to-apply/>)

## Program Requirements

PhD student requirements for the Civil and Systems Engineering Department include:

- 8 Courses at the 600- or 700-level, completed with a grade of B or better
- Two years/four semesters of graduate seminar courses (Fall semester – EN.560.691 Graduate Seminar, Spring semester – EN.560.692 Civil Engineering and Systems Engineering Graduate Seminar)
- Department Qualifying Examination (DQE)
- AS.360.625 Responsible Conduct of Research short course
- EN.500.603 Graduate Orientation and Academic Ethics short course
- Final PhD Thesis Defense and Graduate Board Oral Examination (GBO)

There are a number of Whiting School of Engineering policies (<https://homewoodgrad.jhu.edu/academics/policies/>) related to PhD students.

## Typical Timeline for PhD Students

First Year					
Fall	Credits	Spring	Credits	Summer Term	Credits
Selection of first semester courses (typically 3 or 4) with Director of Graduate Studies or research advisor		Second semester coursework and research		20 Research	9
Language/communication testing and placement for International Students		Department Qualifying Exam (DQE) (completed in May or June)			
AS.360.625	0.5				
EN.500.603	0				
First semester coursework and research	20				
Annual Review completed by January 31					
	20.5		20		9

Second Year					
Fall	Credits	Spring	Credits	Summer Term	Credits
Research	17	Research	20	Research	9

Coursework (typically finishing up this semester)	3 Coursework (if necessary)	
Ph.D. Thesis Committee Meeting encouraged prior to end of Fall semester		
Annual Review completed by January 31		
	20	20
		9

Third Year					
Fall	Credits	Spring	Credits	Summer Term	Credits
Research (Year- round)	20	Research (Year- round)	20	Research	9
Ph.D. Thesis Committee Meeting encouraged		Research			
Annual Review completed by January 31					
	20		20		9

Fourth Year			
Fall	Credits	Spring	Credits
Year 4 and Beyond:		Final semester:	
Research (Year- round)	20	Thesis Defense and Graduate Board Oral Examinator (GBO)	
Ph.D. Thesis Committee Meeting encouraged every Fall prior to the end of the semester		Research	20

Annual review completed by January 31	
	20
	20
<b>Total Credits 187.5</b>	

**Note:** Teaching is an important component of PhD education and students may therefore be assigned teaching assistant duties during one or more semesters.

## Language/Communication Testing and Placement

All PhD students who do not have a prior degree from an English speaking university must take an English Language Assessment. If it is determined at the assessment that the student needs further English language instruction, they will be required to take AS.370.602 American English Pronunciation or equivalent.

## Determination of Permanent Advisor

Students are admitted to work with a specific advisor, the faculty member, listed in the offer letter. If several faculty in the Department of Civil and Systems Engineering expressed a strong desire to work with the student, a nominal advisor will be assigned before the first semester to aid in course selection and provide general advice on PhD degree requirements. In this case, a permanent research advisor, from the faculty who expressed interest, will be selected by the end of the first semester.

A PhD student will not be able to remain in good standing with their academic and research progress if they do not have a research advisor. A student who is without a research/dissertation advisor for a period of 3 months may be placed on probation or terminated from the PhD program.

## Interession

Interession (the period between Fall and Spring terms) is an important time for research. Any leave taken during interession is subject to the policies outlined in the Leave of Absence Guidelines. (<https://homewoodgrad.jhu.edu/academics/graduate-board/enrollment-status-change-forms/>) Release time (if any) granted in that period must be approved by the advisor.

## Department Qualifying Examination (DQE)

The DQE is a comprehensive oral exam to determine whether or not the student is properly prepared to continue in the PhD program. All first-year students studying for a PhD take the DQE towards the end of their second semester, typically in May of the first year. This exam evaluates whether the student is prepared to continue in their PhD studies based on their research progress to date and plans for future research, as well as a grasp of the underlying mathematics and engineering concepts. Possible outcomes of the exam are Pass, Retake, or Fail. Only an outcome of Pass is considered passing the exam. If the student receives a Retake, they are provided a single retake of the exam, typically in the Fall of the second year. Possible outcomes of this exam retake are Pass or Fail. If the outcome of the exam is Fail, the student may pursue, with approval from the chair, a MSE degree. Financial support for a student beyond a failed DQE is not typical.

## Annual Reviews

Reviews of all PhD students in Civil and Systems Engineering must be performed annually prior to January 31, and are consistent with the WSE policy found in the Graduate Student Academic Review Policy. (<https://>

[homewoodgrad.jhu.edu/academics/policies/](http://homewoodgrad.jhu.edu/academics/policies/)) The review process follows the format given in the annual review form ([https://e-catalogue.jhu.edu/engineering/full-time-residential-programs/degree-programs/civil-engineering/civil-engineering-phd/Annual\\_Review\\_Form.pdf](https://e-catalogue.jhu.edu/engineering/full-time-residential-programs/degree-programs/civil-engineering/civil-engineering-phd/Annual_Review_Form.pdf)). The completed form must be submitted to the Academic Program Administrator by January 31. If this annual review is not completed by this date, the student's funding may be jeopardized.

## PhD Thesis Committee

Every PhD student must have a Thesis Committee of at least 3 faculty members. The advisor, in consultation with their student, selects the makeup of the committee, and this information is recorded in the student's file. The student is encouraged to meet with this committee a minimum of once per year. The thesis committee also typically serves as a subset of the actual GBO examination committee and forms the final PhD defense committee. This committee must consist of a minimum of 2 full-time faculty of the Civil and Systems Engineering Department.

## Responsible Conduct of Research

Every PhD student of the Whiting School of Engineering is required to take the Responsible Conduct of Research course (details on the requirement can be found on the WSE Policy on the Responsible Conduct of Research Training (<http://engineering.jhu.edu/wse-research/resources-policies-forms/responsible-conduct-of-research/>) webpage). For Civil and Systems Engineering students, this should be completed in the Fall or Spring of the first year of studies. Students who do not complete this requirement prior to Fall of their third year of studies may put their funding in jeopardy.

## GBO Examination

The University maintains complete guidelines for the Graduate Board Orals here. (<https://homewoodgrad.jhu.edu/academics/graduate-board/graduate-board-oral-exams/>) The GBO committee consists of 5 members, (3 in department, 2 outside) with 2 alternates (1 in department, 1 outside) and is selected by the Department Chair and the Director of Graduate Studies, who will consult with the student's advisor. The GBO in the Civil and Systems Engineering Department is a Final Exam and therefore held simultaneously with the student's thesis defense. Both students and advisors should be aware that 4-8 weeks advance notice is needed in order to allow for scheduling the exam with the faculty and with the Graduate Board.

The student should provide a copy of the dissertation to the GBO committee at least 2 weeks prior to the exam. The exact format of each GBO examination is specified by the individual Chair of the GBO committee; however, a typical format is described here. The public thesis defense is conducted (see below) followed by a private examination conducted by the GBO committee. The examination questions may be on any topic of the committee members' choosing, but many of the questions relate to the student's research. At the conclusion of the examination, the GBO committee will recommend one of the following outcomes: pass, conditional pass, fail with re-examination, fail (final).

## M.S.E. Degree for PhD Students

PhD students may petition for a non-terminal M.S.E. degree following a passed DQE. If a student fails the DQE, they may petition for a terminal M.S.E. degree. In all instances, the student must have satisfied the M.S.E. degree (<https://engineering.jhu.edu/case/academics/masters-program/>) course requirements.

In instances where the research is highly interdepartmental, the student, with permission of the advisor, may request that the M.S.E. degree be

awarded by another department in the Whiting School of Engineering. In such cases, the student must have satisfied M.S.E. degree requirements and receive approval from the awarding department, as well as satisfied M.S.E. degree requirements of the Department of Civil and Systems Engineering and receive approval from our Department Chair. In all cases, the awarding of any JHU M.S.E. degree to a civil and systems engineering PhD student may only occur after the student has completed the DQE.

## Thesis Defense

The Thesis Defense, together with the GBO, is the final examination before the conferral of the PhD degree. The student defends their thesis in a seminar setting that is open to the public. The seminar is followed by a comprehensive examination of the student by the GBO committee.

**Ethics:** The Department of Civil and Systems Engineering is dedicated to upholding the highest standards of academic and research integrity. Plagiarism, and other forms of unethical conduct, are not tolerated. Students are referred to the JHU Graduate Board Policy (<http://homewoodgrad.jhu.edu/academics/policies/>) webpage and the Whiting School of Engineering's Responsible Conduct of Research Policy (<https://engineering.jhu.edu/research/resources-policies-forms/responsible-conduct-of-research-training-for-students-and-postdoctoral-fellows-revised-spring-2020/>) for a discussion of ethics and university policies.

**Thesis Readers:** A committee of at least 3 members is required to read the candidate's dissertation and sign the Readers Letter confirming that the dissertation meets the standards of a PhD thesis. The letter may be signed at the time of the defense if the thesis is found satisfactory or may be signed at a later time if corrections are required. The Advisor in consultation with the department selects the committee members, at least 2 of whom must be full-time faculty of our department. The 3 readers are also expected to serve on the GBO committee. Selection of the readers should be done at the beginning of the semester in which the student plans to graduate. It is the student's responsibility to keep the committee members apprised of all deadline dates.

**Scheduling and Pre-Defense:** The Defense should be scheduled, at least 4 weeks in advance through the department's Academic Program Administrator. A complete written dissertation should be given to the GBO committee at least 14 days in advance of the exam. Failure to meet this 2-week deadline will result in rescheduling the PhD defense and GBO exam. A thesis abstract suitable for advertising the defense should be delivered to the Academic Program Coordinator at least 14 days in advance. The date and place of the Defense, along with the thesis abstract, will be circulated by the department at least 5 days prior to the exam.

**Post-Defense:** Completion of the PhD requirements typically takes 2-8 weeks after a successful defense examination. All data and source codes related to the thesis should be properly archived according to requirements set forth by the Advisor. Any changes or additions specifically requested by the reviewers before or during the defense seminar should be incorporated into the thesis in consultation with the Advisor. A final copy of the thesis must then be made available to the reviewers for inspection no less than 48 hours before the deadline date for filing set by the Graduate Board.

**Additional Information:** It is the responsibility of the student to be aware of requirements and deadlines. It is suggested that this information be obtained before the start of the semester of intended graduation. All students should plan the timing of the final defense accordingly (making

sure to account for the 4-8 week period following the defense) to satisfy any deadlines related to upcoming graduation or exhaustion of funding.

University requirements (<https://homewoodgrad.jhu.edu/academics/graduation-guide/>) for the thesis can be obtained from the Graduate Board website (<https://homewoodgrad.jhu.edu/academics/graduate-board/>). Information sheets entitled "Dissertation Requirements" are available to student and contain details on the form, cost, and timing for submitting the thesis. Doctoral Theses must be submitted to both the ETD (Library) and the department. The deadline date for filing is set by the Graduate Board Office. This date also applies to filing with the Whiting School Graduate Committee and with the department. A receipt of ETD approval email must be sent to the Academic Program Coordinator and the Graduate Board/WSE Office of Academic Affairs (for M.S.E students).

For current faculty and contact information go to <https://engineering.jhu.edu/case/faculty/>