



PH.D. IN ENGINEERING AND APPLIED SCIENCES

Graduate Student Handbook

UNIVERSIDAD POLITÉCNICA DE PUERTO RICO

GRADUATE SCHOOL

Contact Information: escuelagrada@upr.edu

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INTRODUCTION

This policy and procedures **Handbook** is designed for graduate students pursuing the Ph.D. in Engineering and Applied Sciences program at Universidad Politécnica de Puerto Rico. It provides essential information and official guidelines for navigating key milestones in the doctoral journey. Students are expected to be familiar with the processes and requirements described herein.

PROGRAM OVERVIEW

The Ph.D. in Engineering and Applied Sciences at Polytechnic University of Puerto Rico aims to prepare professionals with a robust background in science and engineering, capable of conducting advanced research, solving complex problems, and contributing to scientific knowledge and societal progress.

This handbook guides enrolled Ph.D. students, outlining key academic processes and expectations during their doctoral journey.

PROGRAM STRUCTURE

The Ph.D. program typically spans approximately 12 trimesters (i.e., approximately 4 years). Students enroll in coursework followed by the comprehensive exam. Then, students focus on the dissertation work, which is divided into progressive stages. Continuous enrollment in dissertation credits is mandatory to maintain academic standing and avoid delays.

Although the program is designed for this timeframe, the actual duration may be longer depending on each student's progress and individual circumstances.

MENTORING

Doctoral students must complete one-on-one mentoring, coordinated by the Graduate School, before registering for courses each term. This required process ensures personalized guidance throughout their academic journey.

DOCTORAL COMMITTEE

The committee overseeing a doctoral student's research comprises four individuals, each bringing unique expertise to the team. This committee is led by a chairperson specializing in the students' primary study area. The second member offers expertise in a supplementary area, broadening the scope of guidance. A third position is filled by a faculty member from PUPR. All could be full- or part-time, ensuring institutional graduate-level insight. Completing the team is an external member who provides an objective, outside perspective.

All four committee members must hold a Ph.D., ensuring high academic rigor and scholarly mentorship for the doctoral candidate. No friends or family members are permitted to serve on the committee to maintain impartiality and professional integrity.

COMPREHENSIVE EXAMINATION

Ph.D. students must successfully pass a comprehensive examination. The Comprehensive Examination assesses a student's mastery of core knowledge in their engineering specialty and readiness to proceed with dissertation research.

Requirements:

The exam consists of two components: a written and an oral examination. The written exam:

- Held approximately in the fifth week of regular trimesters (Fall, Winter, Spring).
- Conducted in person.
- It has a duration of up to 4 hours.
- Content focused on the student's core specialization according to Appendix A.
- The minimum passing grade (P) is 80%.

The oral exam:

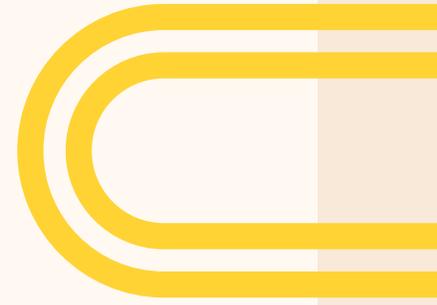
- Scheduled approximately in weeks 10 and 11 of the trimester.
- Conducted in person.
- Involves the student and all doctoral committee members.
- It has a duration of up to 4 hours.
- All doctoral committee members must agree on the passing grade of the oral exam.
- The minimum passing grade (P) is 80%

Additional Notes:

- The exam components can be attempted twice.
- A student who fails the written component must wait one trimester before retaking the exam and, during the scheduled trimester academic mentoring session prior to the start of that term, must submit a study plan specifying how the trimester will be used for preparation and what topics will be covered.
- For the oral component, the committee determines when to retake it.
- Students must consult their committee to prepare effectively for both components.

EXAM ENROLLMENT REQUIRES SUCCESSFUL COMPLETION OF ALL CORE CURRICULUM, COMPLEMENTARY AREA, DOCTORAL ADVANCED, AND COMMON DOCTORAL COURSES.

DISSERTATION PROCESS



After passing the comprehensive examination, students must remain continuously enrolled in dissertation credits until they complete the degree.

PROPOSAL PRESENTATION (P-P)

The first step is to develop and present a dissertation proposal outlining the research plan. This proposal presentation is a formal academic event strictly between the student and the doctoral committee; it is not open to the broader university community. A representative from the Graduate School oversees the event solely to attest to the formality of the process, without a vote or voice in the evaluation.

This proposal must:

- Define the research problem.
- Demonstrate familiarity with relevant literature.
- Describe the proposed methodology.
- Present an expected contribution to knowledge.

The committee will evaluate the proposal and provide recommendations. Full approval (100%) of the committee members is required for the proposal to be accepted.

The dissertation proposal can be attempted twice. A student failing the dissertation proposal must retake it when the committee determines it.

DISSERTATION DEFENSE (D-D)

The dissertation defense is a formal presentation in which candidates present their research findings to the committee and the community (i.e., the event is open to the university community). Key requirements include:

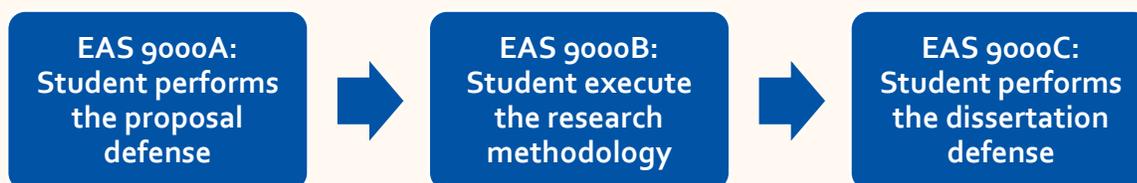
- The committee chair must notify the graduate school dean at least one month before the proposed defense event date.
- Graduate School will publish the dissertation notification to the university community at least 2 weeks in advance.
- The student must submit the complete dissertation document at least 2 weeks before the defense.
- A public oral presentation followed by questions from the committee and audience.

Approval of the dissertation requires 100% agreement from all committee members. The dissertation defense may be attempted a maximum of two (2) times. If a student does not pass the defense, it must be retaken at a time determined by the dissertation committee.

DISSERTATION TIMEFRAME

Students must remain continuously enrolled in dissertation credits (in accordance with the continuous enrollment policy) after advancing beyond coursework and until the dissertation is successfully defended and all degree requirements are completed. Dissertation course codes are EAS 9000A, EAS 9000B, and EAS 9000C.

Registration Timeline (ideal scenario):



The dissertation must reflect original research and contribute new knowledge or innovation to the field. Students should maintain regular communication with their doctoral committee to ensure progress.

EXTENSIONS AND CONTINUOUS ENROLLMENT

Students requiring additional time beyond the initial dissertation sequence must enroll in the corresponding extension course (EAS 9001A - EAS 9001F) each trimester until the dissertation is completed. These extension courses carry zero (0) credit hours but are subject to applicable fees.

After EAS 9001F, students cycle back to EAS 9000A if still incomplete. Cycle back to EAS 9000A must be approved by all doctoral committee members and the graduate school dean.



GRADUATE SCHOOL (GS) FORMS

Several official Graduate School forms (GS Forms) must be completed throughout the doctoral program. The GS Forms that apply to the graduate programs include:

- GS - 1 Master's Design Project / Thesis Supervision
- GS - 3 Doctoral Study Plan and Advisor's Information Submission
- GS - 4 Dissertation Committee Selection
- GS - 5a Comprehensive Exam Request
- GS - 5b Comprehensive Exam Written Component Certification
- GS - 5c Comprehensive Exam Oral Component Certification
- GS - 6 Responsible Conduct of Research Approval
- GS - 7 Dissertation Proposal Presentation (P-P) Completion Status
- GS - 8 Dissertation Defense Announcement Request
- GS - 9 Dissertation Defense (D-D) Completion Status
- GS - 10 Completion of Technical Content for Doctoral Dissertation, Thesis, or Design Project
- GS - 11 Scholarly Contribution Requirement
- GS - 15 Doctoral Degree Checklist
- GS - 25 Editing and Format Certification
- GS - 30 Certification of Final Document Presented: Dissertation, Thesis, or Design Project
- GS - 31 Request for Grade Review

Students must ensure all required forms are completed, signed, and submitted on time.

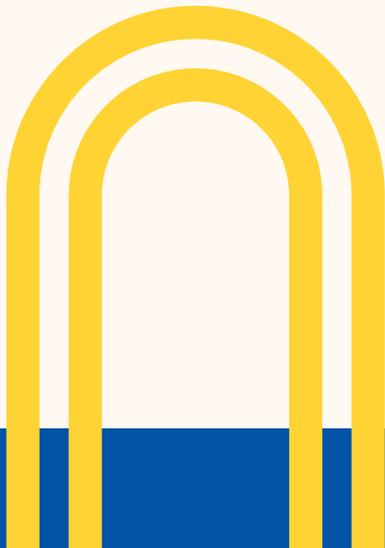
APPENDIX B INCLUDES A TABLE LISTING ALL GS FORMS, ALONG WITH THEIR NAME, PURPOSES, WHERE TO FIND THEM, WHEN TO SUBMIT THEM, AND WHERE TO SUBMIT THEM.

ADDITIONAL INFORMATION AND REMINDERS

All research conducted must uphold ethical standards and follow institutional guidelines.

Students are encouraged to contribute to publications and professional presentations to enhance their academic profile.

This handbook does not cover every scenario. Students should consult the Graduate School for additional guidance. Policies are subject to change, and it is the student's responsibility to stay informed of updates.



APPENDIX A

Guías para el Examen Comprensivo Doctoral

Ph.D. en Ingeniería y Ciencias Aplicadas

Solicitud del Examen:

Los estudiantes interesados en tomar el examen comprensivo doctoral deben completar la hoja GS5a *Comprehensive Exam Request* y entregarla en la Escuela Graduada. Una vez se evalúe y apruebe esta solicitud, se notificará al estudiante para que proceda a matricular el curso *EAS 8900 Comprehensive Exam*.

Requisitos del Examen:

El examen comprensivo doctoral tiene los siguientes requisitos:

1. El examen tiene una parte escrita y una verbal
2. El estudiante debe completar y aprobar la parte escrita antes de pasar a la parte verbal
3. La nota de pase para aprobar cada componente debe ser igual o mayor a 80%

Itinerario Académico del Examen:

El examen comprensivo se ofrece en los trimestres académicos regulares (FA, WI, SP). No se ofrece en verano.

La parte escrita del examen comprensivo doctoral se ofrecerá en la quinta semana del trimestre académico. Este examen es presencial y el estudiante tiene un máximo de 4 horas para culminar el mismo. Los resultados de este examen estarán listos en la séptima semana del trimestre académico.

La parte oral del examen comprensivo doctoral es individualizada pues requiere la presencia del comité doctoral del estudiante. Este examen es presencial y el estudiante junto a su Comité tienen un máximo de 4 horas para culminar el proceso. Estas citas para la parte oral del examen comprensivo doctoral las coordinará la Escuela Graduada entre la octava y novena semana del trimestre académico.

Contenidos Académicos:

La parte escrita del examen comprensivo doctoral será específicamente del curso medular que corresponde a la especialidad de la Ingeniería del Ph.D., según presentado en la

Tabla 1. Se recomienda que el estudiante repase los temas del curso medular utilizando de guía el prontuario y libro de texto de la asignatura correspondiente.

Tabla 1: Contenido Académico Parte Escrita del Examen Comprensivo Doctoral

Especialidad de Ingeniería	Curso Medular
<i>Civil Engineering - Structures</i>	<i>Escoger entre: CE 6370 – Finite Element Methods in Engineering MMP 6000 – Advanced Statistics and Quality Improvement</i>
<i>Civil Engineering - Water Resources & Water Treatment</i>	<i>Escoger entre: CE 6210 – Probability and Statistics in Water Resources MMP 6000 – Advanced Statistics and Quality Improvement</i>
<i>Civil Engineering - Geotechnical</i>	<i>Escoger entre: CE 6370 – Finite Element Methods in Engineering MMP 6000 – Advanced Statistics and Quality Improvement</i>
<i>Civil Engineering - Construction</i>	<i>CE 6512 – Value Engineering MMP 6000 – Advanced Statistics and Quality Improvement</i>
<i>Manufacturing Engineering</i>	<i>MMP 6000 – Advanced Statistics and Quality Improvement</i>
<i>Electrical Engineering</i>	<i>EE 6010 – Mathematical Methods for Signal Processing</i>
<i>Computer Engineering</i>	<i>Escoger entre: CECS 6120 – Computer Architecture CECS 6510 – Software Engineering I</i>
<i>Mechanical Engineering - Design, Thermal, and Fluid Mechanics, Aerospace</i>	<i>ME 6014 – Advanced Engineering Mathematics</i>

La parte oral del examen comprensivo doctoral es individualizada y se recomienda que cada estudiante consulte con cada integrante de su Comité Asesor para determinar la naturaleza específica de su examen y las áreas específicas de estudio que debe repasar.

Repetición del Examen Comprensivo:

El examen comprensivo se puede tomar un máximo de dos veces. Esto quiere decir que, los estudiantes que no pasen el examen comprensivo en el primer intento, tendrán la oportunidad de volver a tomar el examen en una próxima ocasión. Si el estudiante repite el examen comprensivo deberá dejar un trimestre (FA, WI, SP, SU) de descanso entre cada intento. En dicho trimestre, ejecutará un plan de estudios para prepararse para el segundo intento del examen comprensivo.

No hay tercer intento en este examen comprensivo. Si el estudiante fracasa por segunda ocasión el examen comprensivo, no podrá continuar en el PhD y se le referirá a mentoría académica para que evalúe opciones en otro programa académico.

APPENDIX B

GS FORMS

Form	Name	Purpose	Where to Find It	When to Submit	Where to Submit
GS-3	Doctoral Study Plan and Advisor's Information Submission	Present your program study plan and identify your Dissertation Advisor.	PUPR website → Graduate School → Graduate School Forms	Before completing the first year, as part of the Seminar A or B courses.	Graduate School
Study Plan Projection	Study Plan Projection	Project study plan for the next four years.	PUPR website → Graduate School → Graduate School Forms	With GS-3	Graduate School
GS-4	Dissertation Committee Selection	Identify Dissertation Committee members.	PUPR website → Graduate School → Graduate School Forms	Before completing the first trimester of year two, as part of the Seminar E or F courses.	Graduate School
GS-5a	Comprehensive Examination Request	Certify completion of seminar credits.	PUPR website → Graduate School → Graduate School Forms	Submitted by the Committee's Chairperson	Graduate School
GS-5b	Comprehensive Exam Component #1 (Written) Certification	Certify the written exam outcome.	N/A	After obtaining the results, the Graduate Dean emails the student	Student file
GS-5c	Comprehensive Exam Component #2 (Oral) Certification	Certify oral exam outcome.	N/A	Committee's Chairperson	Graduate School
GS-6	Responsible Conduct of Research	Confirm proposal meets ethical standards regarding human subjects. Does not apply to all proposals.	PUPR website → Graduate School → Graduate School Forms	After IRB approval	Graduate School
GS-7	Dissertation Proposal Presentation (P-P) Completion Status	Certify proposal approval.	PUPR website → Graduate School → Graduate School Forms	Committee's Chairperson	Graduate School
GS-8	Dissertation Defense Announcement	Announce final defense date.	N/A	≥3 weeks before submission	Graduate School
GS-9	Dissertation Defense (D-D) Completion Status	Certify defense approval.	N/A	Committee's Chairperson	Graduate School
GS-10	Completion of Technical Content	Certify technical content completion.	N/A	Committee's Chairperson	Graduate School
GS-11	Scholarly Contribution Requirement	Certify the required publication.	N/A	Once performed by the student.	Graduate School
GS-15	Doctoral Degree Checklist	Verify all degree requirements are met.	N/A	Graduate School representative	Graduate School
GS-25	Editing and Format Certification	Editor certifies format and content on the final paper.	PUPR website → Graduate School → Graduate School Forms	After Dissertation Defense Completion	Graduate School
GS-30	Certification of Final Documents	Certify Student met all grade requirements.	N/A	After GS-15	Graduate School
GS-31	Request for Grade Review	Grade Review Process.	PUPR website → Graduate School → Graduate School Forms	As Needed	Graduate School

APPENDIX C

MILESTONES TO THE PH.D DEGREE

1 Establish your Ph.D. trimester by trimester study plan (GS-3)



2 Select your Dissertation Advisor (GS-3)



3 Select your Dissertation committee (GS-4)



4 Complete all course work (Principal, Supplementary, Advanced, EAS8910, EAS8901A-F)



5 Request the comprehensive exam (GS-5a)



6 Approve comprehensive exam - Written Component (GS-5b)



7 Approve comprehensive exam - Oral Component (GS-5c)



8 Obtain IRB approval (only for research involving human subjects) (GS-6)



9 Present the dissertation proposal (P-P) and obtain committee approval (GS-7)



10 Execute dissertation proposal



11 Comply with publication requirement (GS-11)



12 Defend the dissertation (D-D) and obtain committee approval (GS-9)



13 Participate in the commencement ceremony (Graduation)

