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UNIVERSITY OF NOTRE DAME

Applied and Computational Mathematics and Statistics

ACMS Doctoral Student Handbook

Preface

The purpose of this handbook is to explain the rules and procedures of the Applied and Computational Mathematics and Statistics (ACMS) Department as they pertain to ACMS graduate students. As specified by the Graduate School, all graduate programs are to have a guide that sets out the basic policies of the program and provide guidance on the department's expectations. This handbook accompanies the *Graduate Bulletin of Information* and the *Academic Code of the Graduate School* available at https://graduateschool.nd.edu/policies-forms/forms-policiesprocedures/.

A variety of topics are addressed in this handbook. Part I - Introduction gives overview of the program. Part II - The ACMS Guide to Graduate Studies describes academic policies and procedures. In Part III, the ACMS appeals procedure is discussed. Questions on specific items may be brought to the Director of Graduate Studies (DGS) of the ACMS department. In the event that errors are detected in this guide, corrections will be distributed to the department via the department's list-servs.

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Part I

Introduction

The ACMS Graduate Student Handbook consists of three parts:

1. this introduction, which gives an overview of the program;
2. the ACMS Guide to Graduate Studies, with detailed deadlines and expectations; and
3. the ACMS Appeals Procedure.

In addition to this Handbook, the Graduate School has webpages (https://graduateschool.nd.edu/policies-forms/forms-policies-procedures/) with the Academic Code of the Graduate School and other useful information such as fellowship and grant opportunities.

In addition to the requirements described in the **Academic Code of the Graduate School** and the **ACMS Guide to Graduate Studies**, students are expected to follow the procedures outlined below.

1. Finding Advisors

One of your main goals in your first year of graduate studies is to find a Ph.D. dissertation advisor.

The faculty who can serve as an ACMS Ph.D. advisor should be either an ACMS tenured and tenure-track faculty (T&TT) member or an ACMS concurrent faculty member. There are some restrictions:

- each tenured ACMS T faculty member uses his/her research grant to support his/her students;
- each untenured ACMS TT faculty member can have one student supported by a Notre Dame graduate stipend; and
- concurrent faculty must guarantee support of all ACMS students they advise, except for the semester(s) when the students teach for the ACMS). A concurrent faculty can advise at most two ACMS PhD students. The total number of ACMS PhD students advised by all concurrent ACMS faculty members combined should not exceed five.

How do you find an advisor?

Talk to faculty! Attend colloquia and seminar talks! Attend departmental teas and talk to faculty! Work hard in your classes and talk to the faculty teaching the classes!

You might have come to graduate school knowing what you want to work on, but few of us ended up working on what we thought we wanted to work on.

Why not?

After talking to faculty we realized there were interesting areas of research we never knew about, or sometimes we found that our view of what was interesting was out-of-date or did not coincide with the interests of faculty. Even if you want to work with a faculty member, they may not be able to take you as a student, e.g., if they have too many students. There are more than enough faculty to advise all the ACMS graduate students, but you might need to adjust your interests. To maximize your options, you can take ACMS 60690 and 60790 (Numerical Analysis I & II); ACMS 60650 (Applied Partial Differential

Equations); ACMS 60850 (Applied Probability); ACMS 60801 (Statistical Inference); and ACMS 60786 (Applied Linear Models). This will allow you to do either applied mathematics or statistics research.

You will need to find an advisor by Jun 30 and pass the written exams at the end of the first year in the first year to stay in the program. With the advisor, you work out the topic for your oral Ph.D. candidacy exam; the oral candidacy exam should be taken before April 15 of your second year in the PhD program. To prepare for your oral candidacy exam, you will need to work with your advisor to plan your study and research over the summer at the end of the first year and the fall semester of your second year.

2. Student Status

A student is considered full-time if he or she is registered for at least 9 credits and the adviser certifies that the student is working full-time. Part time PhD students will only be allowed in exceptional cases. A faculty member must agree to advise the PhD student, provide an explanation of the exception, submit a detailed plan for the timeline of the student's advancement through the program, and a description of how the student will meet the requirements for the written and oral qualifying exams as well as course requirements. The plan requires the approval of the DGS. Part time students are not eligible for financial support from the institution.

At first, the work is almost entirely tied to courses. Later, research and the doctoral dissertation is the focus. When the student register for research and dissertation with an advisor, the student will need to make satisfactory progress and keep the adviser informed about his or her progress to receive “pass” on the registered research and dissertation course

A student who does not succeed in passing the first year courses is not permitted to continue in the second year. A student who does not pass the written candidacy examinations is dismissed from the program by the end of fall semester of the second year of his/her study. A student who does not find an advisor by Jun 30 in the first year is not permitted to continue. A student who is identified as an extreme under-performer (e.g., GPA below 2.5 in any single semester, or below 3.0 for two consecutive semesters, three consecutive U grades are examples extreme underperformance) can be immediately dismissed.

A student must fulfill all doctoral requirements, including the dissertation and its defense, within eight years from the time of matriculation, unless interrupted by approved medical leave(s) and/or approved childbirth accommodation(s). Failure to complete any of the Graduate School or departmental requirements within the prescribed period results in forfeiture of degree eligibility. A student is normally expected to finish within five years.

3. Master of Science in ACMS en route to a Ph.D.

The Master of Science in ACMS is intended to recognize masters-level competency in applied and computational mathematics and statistics for students enrolled in a doctoral program at the University. Students in ACMS will satisfy the requirements of the master degree en route to their doctorates, and students in other doctoral programs at the University may obtain the degree by taking ACMS courses and passing the written and oral examinations described in the department web site (http://acms.nd.edu/graduate-programs/masters-program-research/). This is a different

degree from the professional Master of Science in Applied and Computational Mathematics and Statistics (MSP-ACMS), which is intended to be a terminal degree.

4. Financial Support

To receive continued financial support as TA, RA or fellows, students are required to maintain good academic standing, and to carry out in a conscientious way any teaching (or other) duties associated with the support. The ACMS Department rarely provides financial support beyond the fifth year. Students supported by TA or fellowships are not allowed to take any employment without special approval from their advisor and the DGS, including during the summer semester. Employment of students supported by non-departmental funds must be made clear prior to the start of the support and approved by the funder, advisor and DGS.

5. Teaching and TAing

The teaching assistants serve two distinct goals for our Ph.D. program. First, all courses in the department shall be served with the highest quality; the department's reputation depends on having each of its undergraduate courses be a high quality product. Second, the training of teaching is an integral part of our graduate program. For an academic job, teaching experience is vital.

First year students have minor duties for helping exams. If any portion of the stipend comes from any fraction of one TA slot, the first year student will be assigned TA duties for at most 9 hours per week.

The policy set forth here clarifies the duty expected from a teaching assistant starting from his or her second academic year of study:

- Any student whose stipend (or part of the stipend) comes from one full TA slot will be assigned 100% TA duties.
- Any student whose stipend comes from a percentage of one TA slot will be assigned TA duties proportional to the percentage from one TA slot, rounded to the nearest hours

The opportunity to teach as an instructor does exist, usually for one section of a multi-section introductory course, under the supervision of a senior faculty member, or a summer class. In order to teach their own class, students must first successfully serve as a TA and have attended the Teaching Seminar. The teaching and TAing responsibilities of an ACMS graduate student in our Ph.D. program are outlined at https://www3.nd.edu/~acms/Associate_Chair/teaching/grad/responsibility.htm.

6. Travel

All travel must be approved prior to traveling. Travel to attend conferences and to give seminars is encouraged. Travel approval forms are available on the department web site. These forms must be completed prior to travel when going on a research trip, any travel where TA or teaching duties are missed, and any extended personal trip (including summers). It is student’s responsibility to arrange a qualified person approved by the course chair/instructor to cover any missed duties. If you are the sole instructor for a course, both your advisor and the associate chair of the department need to approve. If you are not teaching or TAing, the approval from your advisor is needed.

Regarding the financial support for travelling to a conference.

- Most conferences/meetings provide some sort of travel support for graduate students.
- In addition, ask your advisor for the possibility of support. Advisors with research funding might have budget allocated to cover their students' travel expenses.
- If you are giving a talk, you may also apply for funds through the GSU (https://gsu.nd.edu/student-resources/professional-development-trec/).
- The Graduate School Professional Development Awards (GSPDA) support the academic and research training of graduate students. Please make sure you do not miss the deadline of applying travel funds (https://graduateschool.nd.edu/graduate-training/researchcommunication/gspda/).
- The department has a limited amount of money for supporting graduate student travel. When this funding is available, any graduate student, who has passed the oral candidacy examination, may apply for up to five hundred dollars of conference or seminar travel support per year from the department. The application form for the travel support from the department is available at https://acms.nd.edu/resourcesforfacultyandstudents/, and should be submitted to the DGS for approval at least two weeks before the trip.

7. Jobs outside the department

Additional jobs may not be permitted if you are being paid by the department to hold TA duties or by a fellowship. First year students who are paid a university stipend (with reduced TA duties) may not accept outside employment at all.

According to graduate school policy, graduate students are only permitted up to 20 hours/week of duties. An Instructor/TA assignment in the ACMS department is considered full-time (18 hours/week); however, the ACMS department only assigns up to 12 hours per week of TA duties so the student may focus on his/her studies and dissertation. Therefore, no additional jobs are allowed for students who are assigned full-time TA duties. Students on fellowship with no TA duties must also receive approval from his/her advisor and the DGS prior to applying for any positions outside the department.

For students supported by research grants, an additional job may be approved if it is 1) allowed by the funding source, and 2) approved by the student's advisor and the DGS.

Prior to applying for a position, the student must complete the PhD Additional Job Request Form found at the bottom of the Resources for Faculty & Students page on the ACMS website and the signed form must be submitted to the to the ACMS office.

Regardless of the duties assigned, students should always receive an approval of his/her advisor and the DGS before applying for internships or positions outside the department.

8. Colloquium, Teaching Seminar, Applied Mathematics Seminar, and Statistics seminar

Every semester, residential students in the first year are required to register for the weekly general ACMS colloquium (ACMS63010). To receive a pass for the ACMS63010, students are required to provide DGS a written report consisting of summaries on the subject matter of a

minimum of 6 talks each semester. In addition, first-year students are also required to attend the teaching seminar in the spring semester.

Residential students in Year 2 to Year 4 are required to attend at least 4 talks per semester through either the Applied Mathematics Seminar or Statistics Seminar by officially registering for ACMS colloquium (ACMS63010) in the spring semester each year. 0.5 credit hours are awarded by the end of each year after attending at least 4 seminars each semester. No written reports are required but attendance will be tracked and recorded by the department.

If the seminar schedule overlaps with other courses a student will take for a particular seminar, the student will need to provide proof and would then be excused from attending the seminar talk. For second- to fourth- year doctoral students, to receive an S grade, they need to attend a minimum of 4 Applied Mathematics or Statistics seminars in each semester.

9. PDEs Placement Exam

The placement exam does not apply to all doctoral students. If a doctoral student plans to take ACMS 60650 (a required course for Applied Math track students, or optional for Stats track students) in the spring semester of the 1st year, then the student is required to either:

1) take the PDEs placement exam on the Thursday or Friday immediately before the first week of the fall semester, or

2) skip the placement exam and enroll in ACMS 40750 (undergraduate level PDE) during the fall semester of their first year.

The placement exam covers undergraduate PDEs materials. Students can use the course materials for ACMS 40750 to study for the exam. The course is cross-listed as MATH 40750, which is likely easier to find online when searching for the syllabus, etc. Students who fail the PDE placement exam are required to take ACMS 40750 in the first-year fall semester to satisfy the pre-reqs for ACMS 60650 offered in the spring semester. Failing the placement exam should not reflect poorly on a student and has no consequences beyond taking 40750 in Fall. If a student is unsure about whether to take the Applied Math track or the Stats track for their doctoral study, it is better for the student to take the PDE placement exam rather than not.

10. Course Schedule for First-year Students

The tables below show typical course schedules for ACMS doctoral students in their first year of graduate study. Undergraduate materials will be assumed as prerequisites. Students are expected to make up any missing materials that they did not learn in their undergraduate program. For example, students who intend to take ACMS 60650 (Applied Partial Differential Equations) are expected to know undergraduate PDEs materials (see PDE Placement Exam in Section 9 above).

Applied Math Track

First Year, Fall Semester

ACMS 60850 Applied Probability (required)	3 credits
ACMS 60690 Numerical Analysis I (required)	3 credits
Either graduate-level elective *or* ACMS 40750	3 credits
ACMS 63010 ACMS Colloquium (required)	0.5 credits

First Year, Spring Semester

ACMS 60650 Applied PDEs (required)	3 credits
ACMS 60790 Numerical Analysis II (required)	3 credits
Graduate-level elective	3 credits
ACMS 63200 Teaching Seminar (required)	0.5 credits
ACMS 63010 ACMS Colloquium (required)	0.5 credits

Statistics Track

First Year, Fall Semester

ACMS 60850 Applied Probability (required)	3 credits
ACMS 60786 Applied Linear Models (required)	3 credits
Graduate-level elective	3 credits
ACMS 63010 ACMS Colloquium (required)	0.5 credits

First Year, Spring Semester

ACMS 60801 Statistical Inference (required)	3 credits
Two graduate-level electives	6 credits
ACMS 63200 Teaching Seminar (required)	0.5 credits
ACMS 63010 ACMS Colloquium (required)	0.5 credits

Part II
Guide to Doctoral Studies in ACMS

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1. Introduction

The doctoral program in Applied and Computational Mathematics and Statistics (ACMS) is designed to train researchers skilled at conducting independent research in applied mathematics, computational mathematics, or statistics. The granting of a doctoral degree is recognition that a student's mastery of the discipline and research accomplishments meet the standards recognized by the community of professionals in the field.

The program requirements for the doctorate in ACMS are structured to enable students to begin research and coursework early in their studies. The general features and specific requirements for the doctorate in ACMS are described below. These requirements include coursework, passing written and oral candidacy examinations timed to certify the student's ability to commence doctoral research, and satisfactory completion of a doctoral dissertation.

2. Course requirements

If there is conflicting information between the description below and the graduate school bulletin, the final say rests with this handbook.

Table 1: credit requirement for doctoral students

Year	Requirement		
	GPA credits	Non-GPA credits	Total (minimum)
1	18	1.5 (ACMS colloquium, Teaching seminar)	19.5
2	3♯	0.5 (ACMS seminar) + minimum 14.5 credits (e.g. ACMS 98698)	18
3	3♯	0.5 (ACMS seminar) + minimum 14.5 credits (e.g. ACMS 98698)	18
4	3♯	0.5 (ACMS seminar) + minimum 14.5 credits (e.g. ACMS 98698)	18
5*	0	minimum 18 credits *	18*
Total	27 ♯		73.5*

* A student may graduate in 4 years if all credit requirements and research requirements (per the student advisor and the official graduate school milestones) are fulfilled.

♯ If a graduate student teaches a regular course or a tutorial as an instructor, the student does not have to fulfill the 3 GPA credit requirement for up to 2 years, and the required GPA credits is $27 - \{6, 3 \times \#\text{ of years of teaching a course}\}$. For example, if a student teaches once during Y2 to Y4, then the required GPA credits for the whole doctoral students is 24; if a student teaches twice or more during Y2 to Y4, then the required GPA credits for the whole doctoral students is 21.

A doctoral student is required to complete 19.5 credits of ACMS courses at the graduate level in the first two semesters of study to remain in good standing, with a minimum of 3 regular (basic or topics) courses per semester. At the beginning of the first two semesters of study, the student must submit for approval by the Director of Graduate Studies (DGS) a list of the courses the student plans to take that semester. Students are allowed to take courses in other departments to improve their abilities to work on interdisciplinary problems.

Students who take ACMS 40750 in the fall semester of their first year are not required to take an ACMS breadth course (elective) during that semester (see schedule for first year students above). However, since ACMS 40750 does not count toward students' total PhD credit hours (see below)

These students will need to take one additional course during some other semester of their PhD to make up for the missing credit hours and satisfy the total credit hour requirements.

At the discretion of the DGS and the Graduate School, students may transfer credit from courses completed before enrolling in the ACMS PhD program. Any transfer of credits must be approved by the Graduate School and therefore must abide by the requirements described in the Graduate School Bulletin of Information. Some of these requirements are as follows:

- The courses are graduate courses appropriate for the ACMS PhD program and the student received a B or higher in the courses.
- The student was a graduate student when the courses were taken.
- The courses were completed within 5 years before admission to the ACMS PhD program.
- At most 6 credits can be transferred from an unfinished master's degree. From a completed master's degree, at most 9 credits can be transferred to an ACMS Master's degree and at most 24 credits to an ACMS PhD.

See the Graduate School Bulletin of Information for more details. Note that course requirements for PhD students after Year 1 are very light (1 course per year), so most PhD students will easily satisfy the course requirements without needing to transfer credits. As a result, transferring credits is not necessary or beneficial for most PhD students. If a student wishes to transfer credits, they should email the Director of Graduate Studies with the course descriptions and a written explanation for why the student wishes to transfer credits. Note also that the courses to transfer must have been taken while the student was a graduate student. Graduate courses taken while the student was an undergraduate student cannot be transferred.

Some advanced undergraduate courses numbered 40000 – 59999 may be taken to satisfy up to 6 hours of graduate credit requirements. Grades in these courses will count towards the student's G.P.A. For purposes of progress within the PhD program or admission to PhD degree candidacy, graduate credit is allowed for all 40000 – 59999 courses *except* for: ACMS 40390, 40750, and 40730. No graduate credit is allowed for courses below the 40000 level.

A doctoral student is required to complete a minimum of 3 credits of basic or topics courses at graduate level in each year in Year 2 to Year 4 to broaden and deepen his or her knowledge in the field of ACMS except in the year when the student serves as an instructor for a regular course or a tutorials for up to 2 years. Courses has minimal connection to the topics in ACMS (e.g. CSC 60693 - Common Good Initiative) or students' research should NOT count towards the 3 credits requirement. Students should get their advisors' approval if they want to take two or more regular or topic courses per semester in Year 2 to Year 4, or take any course other than Research & Dissertation in Year 5 and beyond. In addition, a doctoral student in Year 2 and beyond has the right to go to the ACMS Colloquium, the Applied Mathematics Seminar, and the Statistics Seminar, without acquiring permission or approval from the student's advisor and the DGS.

PhD students who completed a Master's degree in ACMS before enrolling in the PhD program might have already taken some of the required courses for the PhD program, in which case the Registrar will not allow them to enroll in these courses again. They should submit a request to the DGS for transferring credits for these courses to their PhD program. If they have already taken the courses for written qualifying exams, then they can take the exam in the summer before they begin

their PhD, but this will not count as the first try if they fail. If they fail the exam or if they choose not to take it, then they should audit the qualifying exam course(s) and enroll in a corresponding reading course with the DGS or their prospective advisor.

3. Advisors

Each student in ACMS has a faculty advisor at all stages of his or her studies. The DGS serves as the advisor of each entering student. By June 30 of the first year, the student selects a dissertation advisor from among the regular or concurrent teaching and research faculty in the ACMS department. First year students should consider allow themselves sufficient time to know the faculties' research and thus make more informed decisions. Attending seminar talks and group meetings to learn about the research of the department's faculty members will help understanding the faculty's research and work. The selection of the advisor is accomplished by submitting a signed advisor request form to the DGS.

4. Written candidacy examination

Each student must demonstrate a working knowledge of three basic areas. The materials covered in the written candidacy examinations are covered: (1) ACMS 60850 Applied Probability, (2) ACMS 60690 Numerical Analysis I (in some years, some material from ACMS 60790 Numerical Analysis II might be included. It is always a good idea to double check with the instructors.), (3) ACMS 60650 Applied Partial Differential Equations, (5) ACMS 60786 Applied Linear Models, and (6) ACMS 60801 Statistical Inference. If a student plans to take the Applied and Computational Mathematics track, then Numerical Analysis, Applied Partial Differential Equations, and Applied Probability are the 3 topics to be tested in the written candidacy exams. If a student plans to take the Statistics track, then Applied Probability, Statistical Inference and Applied Linear Models are the 3 topics to be tested in the written candidacy exams. A student has two chances to pass the written examinations. The guidelines, book list, and the sample exams from previous year can be found at http://acms.nd.edu/graduate-programs/doctoralprogram/.

The first written examinations, spanned over 2 days, are administered either the first or the second Thursday/Friday in June (the exact date will be released to students in the week after the spring break). If a student fails the first examinations, he or she will receive a letter issued by the DGS and must take the second examinations in the week immediately before the fall semester in his or her second year. If a student failed both chances to pass the written examinations, he or she is subject to dismissal by the end of fall semester of the second year, but can leave with a master's degree in ACMS if the student has satisfied all the requirements of the master's degree (http://acms.nd.edu/graduate-programs/masters-program-research/).

Notify the DGS of your intended track (Applied & computational Math, or Statistics) at least two weeks prior to the written examination date. If a student switches from Applied/Computational Mathematics to Statistics after passing the written candidacy exams, then the student will need to take the exams on Applied Linear Models and Statistical Inference in June of the academic year when the student makes the switch. Similarly, if a student switches from Statistics to Applied/Computational Mathematics after passing the written candidacy exams, then the student will need to take the exams on Numerical Analysis and Applied Partial Differential Equations in June of the academic year when the students make the switch. The student may be exempt from

re-taking the exams if both the student's new advisor and the DGS agree that the student has mastered the fundamental materials in the respective field.

5. Oral candidacy examination

The oral candidacy examination, taken after the written candidacy examinations are completed, focuses on an "advanced" topic. This material, normally taken from advanced research texts or articles, is aimed at preparing the student for dissertation research. In any case, the student should begin working on the advanced topic with an advisor during the summer following the first year of studies. The material counted as the advanced topic must be specified by the first Friday before the fall break in the second year of the doctoral study and must have the approval of the advisor.

The board of examiners for the oral candidacy examination must have a minimum of three members and a maximum of five. The student's advisor will serve as the board chair. If the student has two co-advisors, there must be at least two additional members on the board. The following table list the allowable committee structures.

Table 2: oral exam / dissertation committee structure

Scenario	**advisor**	**co-advisor**	**+ 1**	**+ 2**	**+ 3**	**+ 4**
1	T/TT ACMS	NA	T/TT ACMS	T/TT or concurrent ACMS	optional	optional
2	T/TT ACMS	T/TT ACMS	T/TT ACMS	T/TT or concurrent ACMS	optional	NA
3	T/TT ACMS	Concurrent ACMS	T/TT ACMS	T/TT or concurrent ACMS	optional	NA
4	Concurrent ACMS	NA	T/TT ACMS	T/TT ACMS	optional	optional
5	Concurrent ACMS	T/TT ACMS	T/TT ACMS	T/TT or concurrent ACMS	optional	NA
6	Concurrent ACMS	Concurrent ACMS	T/TT ACMS	T/TT ACMS	optional	NA
T / TT: Tenure or Tenure-track						

The syllabus for the oral candidacy examination must be made available to all members of the examination board **at least two weeks before the oral exam**. All examiners should restrict their questions to the advanced topic or other material on the given syllabus. Thus, the syllabus should provide guidance to the examiners. A sample syllabus may be obtained from the ACMS office.

The oral candidacy examination begins with a presentation by the student lasting between 30 and 40 minutes. This is followed by questions from the examination board. The examination usually lasts from 1.5 to 2 hours.

Students are expected to take the OCE in Spring of their second year. However, if a student's advisor decides that the student is not prepared to take their OCE in Spring of their second year, they can delay the OCE to Fall of their third year. The decision as to whether the student should take the OCE in Spring of their second year will typically be made jointly by the student and their advisor together, but the final decision ultimately lies with the student's advisor.

After the completion of the examination in Spring of the second year, the examiners can assign one of three decisions:

1) Pass

2) Conditional pass

3) Fail

A student who fails the OCE will be dismissed from the program. A student who receives a conditional pass will need to take another OCE by the end of fall of their third year.

If a student takes the OCE in fall of their third year (either because they received a conditional pass or did not take the OCE in spring), the committee can assign one of two decisions:

1) Pass

2) Fail

A student who fails the OCE in fall of their third year or does not take the OCE by the end of fall of their third year will be dismissed from the program, but can leave with a master degree in ACMS if the student satisfies all the requirements of the master degree:

http://acms.nd.edu/graduate-programs/mastersprogram-research/

A vote of "pass" means that, in the eyes of the particular examiner, the student has passed all parts of the examination. For a board of three, two votes are required to pass; for a board of four, three votes are required to pass; for a board of five members, four votes are required to pass. The student is informed of the outcome of the examination immediately.

6. Switching Advisors and Research Fields

If a student changes advisors after passing the oral candidacy exam and if the research fields between the advisor then and now are different, then the student will need to take the oral exams as early as possible after the switch. The student may be exempt from re-taking the oral exam if both the student's new advisor and the DGS agree that the change in research topic is not substantial enough to warrant another oral exam.

7. Admission to Candidacy

Admission to candidacy is a prerequisite to receiving any graduate degree. It is the student's responsibility to apply for admission, within two weeks after passing the oral examination, by submitting the appropriate form to the Graduate School office through either the program chair or the director of graduate studies. The applicable deadline is published in the Graduate School calendar at http://graduateschool.nd.edu/resources-for-current-students/.

8. Dissertation

Dissertation research, under the supervision of the dissertation director (the student's advisor),

normally begins after the successful completion of the candidacy examinations. The dissertation director is expected to be concerned with the interest and significance of a dissertation topic in applied mathematics, computational mathematics, or statistics, with the originality and accuracy of the research.

After the dissertation director has approved the dissertation, it is submitted to at least two official readers. The dissertation director and the official readers must be tenured or tenure track faculty and at least two of the readers being the regular or non-concurrent tenured or tenure-track faculty from the ACMS department. The dissertation must be submitted to the readers well before the Graduate School deadline for submission. August graduation entails special difficulties, since there are fewer faculty members available during the summer to serve as official readers. In approving the dissertation, the official readers and the dissertation director certify that it is worthy of defense; and they may continue to comment and require changes on the dissertation after the approval. **It is the student's responsibility to distribute the reader's report form to all committee members and notify the dissertation director the approval status at least one week before the dissertation defense.**

The dissertation defense is an oral examination on the contents of the dissertation and its relation to other work in the same area. The board of examiners for the dissertation defense consists of three to five people selected by the student and the student's advisor, and typically consists of the dissertation director and the official readers. If the student has two co-advisors, then the board of examiners must consist of at least two additional members with at least two being the regular or tenured or tenure-track faculty from ACMS. See Table 1 under Section 5 for the allowable committee structure.

The examination begins with a 40-50 minute presentation by the Ph.D. candidate, prepared in consultation with the dissertation director, followed by a question session by the examiners. A dissertation defense is public, in the sense that people other than the candidate and the members of the board of examiners may be present for the defense. Such people leave the room prior to the question session. Voting is for the oral candidacy examination. The candidate is informed of the outcome immediately.

After a successful defense, the candidate may still need to make some changes in the dissertation suggested by the dissertation members. The final version of the dissertation, signed by the dissertation director, is submitted to the Graduate School.

Getting the dissertation read and approved, scheduling the dissertation defense, making corrections, and having the dissertation accepted by the Graduate School is a time-consuming process that requires strict adherence to the timetables set by the Department of ACMS and the Graduate School.

9. Academic progress assessment and annual report

Since the first-year doctoral students are financially supported by the ACMS department in the summer, they are required to do research and prepare for the oral candidacy exam, or study for at least 2 months during the summer. The students should plan to discuss the summer research/study plans with their advisors (assuming they have selected their doctoral advisors) or the DGS.

A doctoral student who has passed the oral candidacy examination is required to submit a written report (2 to 5 pages) to the dissertation committee board (or the board for the oral candidacy examination if the dissertation board has not been formed yet) about his or her academic progress by April 15 each year, except for the year when the student will graduate in May or August. The report must summarize the annual dissertation progress toward the Ph.D. dissertation and describe the research plan for the next year. The student will communicate with the board in February to receive feedback. If the board has serious concerns about a student's academic performance or progress to degree, a warning letter from the DGS will be issued to the student that specifies the concerns and steps necessary to improve the performance. A student who receives a warning letter is placed on probation for one semester and must be assessed by the board again in September. Failure of a student to correct the situation specified in the warning letter may lead to dismissal from the program by the end of fall semester of the same academic year.

10. Residency requirement

The Graduate School requires four consecutive semesters of full-time study as the minimum residency requirement.

11. Responsible conduct of research and ethics requirement

As part of its holistic approach to graduate education, the Graduate School requires all Ph.D. students to complete any and all training modules for the Responsible Conduct of Research and Ethics requirements. All students supported by federal grants must be certified in accordance with national guidelines and the policies of the Office of Research. For more information, please visit: http://graduateschool.nd.edu/professional_development/.

12. Summary of doctoral student responsibilities

1. At the start of each semester in the first year of study, submit for approval by the DGS the course selection. The DGS acts as the student's advisor until the student has a Ph.D. advisor.
2. Identify a dissertation advisor and obtain approval of the potential advisor and DGS before June 30 of the first year of study.
3. Notify the DGS of your intended track (Applied & computational Math, or Statistics) at least two weeks prior to the written examination date.
4. Submit for approval by the advisor and DGS the selection of advanced topics for the oral candidacy examination by the first Friday after the fall break in the second year of study.
5. Submit to the voting members of the oral examination committee the syllabus of materials to be covered on the examination at the time at least 2 weeks before the oral exam.
6. Take the oral exam for PhD candidacy by April 15 in the second year of doctoral study.
7. Apply for admission to doctoral candidacy, within two weeks after passing the oral examination, by submitting the appropriate form to the Graduate School office through either the program chair or the DGS The application deadline is published in the Graduate School calendar (http://graduateschool.nd.edu/resources-for-current-students/)
8. Submit a written report (minimum 2 pages) to the dissertation committee board, or the board for the oral candidacy examination if the dissertation board has not been formed yet, about your academic progress annually after you pass the oral candidacy examination by April 15, unless you will graduate in May or August.
9. Prepare and obtain approval for a doctoral dissertation as described in Section 8.

13. Policy on the use of Generative AI in Comprehensive Exams, Theses, and Dissertations

This is a general policy on the use of generative (and predictive) AI in graduate examinations, theses, doctoral scholarly projects, and dissertations. It applies to graduate students in the Department of Applied and Computational Mathematics and Statistics.

As the culminating examinations in subject proficiency or work of academic writing and research produced by a student in fulfillment of the requirements of a doctoral or master's degree program, a comprehensive exam, thesis, or dissertation is expected to be the student's original work. A student must not submit a comprehensive examination, dissertation, or thesis that contains written content, images, tables, references, software/code, or data generated by artificial intelligence (AI) tools without approval from the student's advisor(s). If approved by the student's advisor(s), the extent of

generative AI usage should be disclosed and described in a statement within the work.

Students are responsible for understanding all aspects of their dissertation research and for the correctness of this work, even components that were aided by the use of generative AI.

Students who violate this policy will be subject to university disciplinary procedures for academic misconduct, which can include termination of their degree program and expulsion from the university.

Students are responsible for checking that the formatting revisions suggested by generative AI are correct and comply with their published style manual and the Graduate School's formatting requirements.

Part III

ACMS PhD Program Appeal Procedure, Academic Integrity, and Dismissal Scope

This policy concerns academic integrity, dismissal and the process for appealing a decision. Issues of personal misconduct are handled separately by Student Affairs. For issues of sexual or discriminatory harassment or disability-related grievances please consult du Lac: A Guide to Student Life at http://orlh.nd.edu/dulac/.

An appeal is a two-step process. A student will first appeal to the program the student belongs to. If the student does not agree with the program's decision, she or he may appeal to the Dean of the Graduate School, who makes the final determination. The Graduate School's grievance process can be found at http://graduateschool.nd.edu.

The following is intended to provide guidance for the first appeal or the local appeal.

1. Violations of Academic Integrity

A commitment to honesty is expected in all academic endeavors, and this should be continuously emphasized to students, research assistants, associates, and colleagues by mentors and academic leaders.

Violations of academic integrity may occur in classroom work and related academic functions or in research/scholarship endeavors. Classroom-type misconduct includes the use of information obtained from another student's paper during an examination, plagiarism, submission of work written by someone else, falsification of data, etc. Violation of integrity in research/scholarship is deliberate fabrication, falsification, or plagiarism in proposing, performing, or reporting research or other deliberate misrepresentation in proposing, conducting, reporting, or reviewing research. Misconduct does not include errors of judgment, errors in recording, selection, or analysis of data, differences in opinions involving interpretation, or conduct unrelated to the research process. Misconduct includes practices that materially and adversely affect the integrity of scholarship and research.

A violation of academic integrity is a serious accusation. The punishment of a student who violates academic integrity is determined by the ACMS CAP, which consists of all tenured faculty members. Depending on the severity of the incident, the student may be dismissed.

If a student is charged with a violation of academic integrity, he or she may appeal the program's decision.

2. Academic Integrity Appeal Process (as reflected in the Graduate Bulletin)

Any person who has reason to believe that a violation of this policy has occurred shall discuss it on a confidential basis with the department chair. If a perceived conflict of interest exists between the chair and the accused, the Dean of the College of Science shall be notified of the charge.

The chair shall evaluate the allegation promptly. If it is determined that there is no substantial basis for the charge, then the matter may be dismissed with the fact of dismissal being made known to the complainant and to the accused if he or she is aware of the accusation. A written summary of charges, findings, and actions shall be forwarded to the dean of the Graduate School as a matter of documentation. Otherwise, the chair will select an impartial panel consisting of three members, one of whom may be a graduate student, to investigate the matter.

The chair will inform the accused of the charges. The panel will determine initially whether to proceed directly to a hearing to further investigate the case, or to dismiss the charges. If the panel decides to proceed directly to a hearing, the hearing will be held within 10 business days of the original notification. If the panel decides that further investigation is necessary, the panel shall immediately notify the chair. If the panel decides that a hearing is not warranted, all information gathered for this investigation will be destroyed. The utmost care will be taken to minimize any negative consequence to the accused.

The accused party must be given the opportunity to respond to all allegations and supporting evidence at the hearing. The response will be made to the appointed panel. The panel will make a final judgment, recommend appropriate disciplinary action, and report to the chair in writing. The report will include all of the pertinent documentation and will be presented within 30 days after meeting with the accused. Copies of the report are to be made available to the accused, the chair, and the dean of the Graduate School. If a violation is judged to have occurred, this might be grounds for dismissal from the University; research/scholarship violations might be reported to the sponsor of the research effort (e.g., NSF, NIH, Lilly Foundation, etc.), if appropriate.

3. Dismissal

Students may be dismissed after failing the written or oral candidacy examination or due to poor academic performance. Expectations concerning the candidacy examinations are available in the descriptions of those examinations in Part II of the handbook.

If a student fails to pass one of the examinations, the DGS will notify the student the failure in writing. If a student is performing poorly academically at any point during his or her study, the DGS will provide the student with a written notice about the poor performance; indicate the expectations necessary to remain in the program; and give the student a specific time when he or she will be re-evaluated.

4. Dismissal Appeal Process

If a student is dismissed for academic reasons, he or she may appeal the program's decision.

Complaints must be initiated by a written statement from the student to the chair of the department within 10 business days from the time when the student is informed of dismissal. To hear the appeal, the department chair appoints an *ad hoc* committee composed of three members: him/herself and at least two faculty members unconnected factually with the case or the reasons for the appeal. A graduate student can replace one of the two faculty members on the committee if the nature of the appeal warrants such. If the department chair has been involved in the case, the Dean of the College of Science, or the Dean's designate, should appoint the committee and designate the person to serve as its chair.

The student's statement should indicate details on the nature of the problem, the date(s) the problem occurred, the grounds upon which the appeal is based, background information that the student considers important and the relief requested. The appeals committee will promptly and thoroughly investigate the appeal to determine whether the relief requested is warranted. The investigation may include interviews and/or written statements from the student, any student

witnesses, faculty or staff members who may be able to provide pertinent information about the facts, as well as a review of any pertinent documents.

In most situations, the appeals committee will complete the investigation in 30 business days. There may be some reports that cannot be investigated within 30 business days. In such cases, the chair of the appeals committee will communicate to the student that the investigation is going to take longer than 30 business days and will also include a statement indicating when the committee anticipates completing the investigation. The department chair will notify the student in writing of his/her decision. If the chair has been involved in the case, the decision will be made by the designated chair of the *ad hoc* committee.

5. Requirements for leaving the PhD program with a Master's Degree

Students who fail their written candidacy exams or other students who leave the PhD program can obtain a Research Master's degree if they meet the requirements for the degree. This section is meant to summarize these requirements as they apply to students leaving the ACMS PhD program. If there is any discrepancy between the requirements listed here and the official requirements for the Research Master's degree, then the official requirements take precedent. Students who wish to obtain a Research Master's degree should contact the Graduate Administrator as soon as possible. The requirements are as follows:

1. **The project requirement:** The project requirement is satisfied if:

    a. the student passes the Ph.D. oral examination, or

    b. the student completes at least 3 credit hours of ACMS 67695 or 98698, or

    c. the student completes the research project course ACMS 80695.

2. **Credit hours:** 30 qualified credit hours are required, with at most 6 credit hours below 6xxxx level. Among them, 21 credit hours must be ACMS courses. S-N courses do not qualify except for ACMS 98698. A maximum of 9 credit hours of ACMS 98698 may be counted towards the master's degree.

Students who fail a qualifying exam and intend to obtain a Research Master's degree must complete the degree requirements during the following fall semester. They should register for 3 hours of ACMS 67695 with their advisor (or, with the approval of the DGS, with another faculty member) and make sure that they register for enough courses to satisfy the credit hour requirement. ACMS 67695 counts toward the required credit hours.