

APPLIED SCIENCE, PHD

Department Website: <https://www.smu.ca/academics/phd-applied-science.html>

The Doctor of Philosophy in Applied Science Program is a research dissertation-oriented degree program. The objectives of the program are:

- to provide graduate students with the opportunity to conduct research in a single or multidisciplinary field of study with practical application;
- to produce graduates with valuable skills in research and communication preparing them for careers in related fields of research and development in industry, government or academia.

The normal duration of the Program for full-time students is three years, with the maximum time for completion at seven years. Students benefit from the guidance of experts in related fields of study within the institution and from outside, as the composition of the supervisory committee reflects the Program's emphasis on the multidisciplinary approach to research. Collaborative research projects with experts at recognized external research institutions are an important part of the Program in the required Research Internship.

Admission Requirements

The Ph.D. in Applied Science follows the general admission requirements (<https://smu-ca-public.courseleaf.com/graduate/academic-regulations/admissions/>) and procedures of the Faculty of Graduate Studies and Research as outlined in the Graduate Studies Academic Calendar.

In addition, to apply for admission to the Program, applicants normally must have:

1. successfully completed an M.Sc. degree in Science from a recognized institution or the equivalent.
2. achieved a minimum cumulative grade point average (CGPA) of 3.70 (an 'A-' standing) in their M.Sc.-level coursework.
3. **Applicants to this program, whose first language is not English, must demonstrate their English language proficiency as outlined in Graduate Academic Regulation 1e with the following additional requirements: a TOEFL (iBT) score of at least 100, with no individual band below 20; or an IELTS score of at least 7.0, with no individual band below 6.5.**

A student wishing to transfer from the M.Sc. in Applied Science program, at Saint Mary's University, directly into the Ph.D. program must submit a form signed by each member of the supervisory committee attesting to the aptitude and motivation of the student to pursue research at the Ph.D. level. **This will normally occur before the end of the student's third semester of residency in the M.Sc. in Applied Science Program.**

The student must also supply two letters of recommendation (these can be from the main supervisor and/or supervisory committee members) that describe the student's aptitude for research and suitability for the Ph.D. in Applied Sciences Program, and the suitability of the research project for training at the Ph.D. level. This form is to be approved by the Program Executive and the Dean of FGSR. The form, the recommendation letters, an online application, and a Doctoral Research Proposal, constitute a complete Application for Transfer to Ph.D. Program.

Students transferring directly from the M.Sc. in Applied Science program at Saint Mary's University who have already taken Graduate Seminar (APSC 6600) will not be required to enroll in Graduate Seminar (APSC 7600), but will be given advance credit so that the 39.0 credit hour minimum is still met. If approved, no M.Sc. degree is conferred.

From the date in which the student officially transfers into the Ph.D. program, the student will have two semesters to complete the Doctoral Research Proposal (APSC 7602) and five semesters to complete the Qualifying Examination (APSC 7603).

Financial Support

Full-time students admitted to the program may be eligible for funding administered by Saint Mary's University. Funding recommendations are made by the program. All successful applicants are automatically considered for graduate funding. Students are encouraged to apply for external scholarships.

Program Requirements

Note: Students not registered in any course work but working on their Program/Thesis must register in Prog Registration/Continuation (FGSR 9000) for every semester (including summer) in which they are in their graduate program.

1. Students will take a total of 39 credit hours comprising 9 credit hours in two core courses (Graduate Seminar (APSC 7600) and Research Applications and Knowledge Transfer (APSC 7610)) plus 30 credit hours of other requirements. At the discretion of the Supervisory Committee, students may also be required to take additional formal courses prior to, and in preparation for, the Doctoral Research Proposal (APSC 7602). The other requirements include:

Code	Title	Credit Hours
APSC 7602	Doctoral Research Proposal	6
APSC 7603	Qualifying Examination	6
APSC 7620	Research Internship	6
APSC 7604	Doctoral Dissertation	12

2. The Supervisory Committee consists of the dissertation Supervisor and two other faculty members with at least one member an expert in a discipline sufficiently removed from the primary research focus. Committee members can be external to the university, but should have a PhD degree or equivalent qualification to serve on the committee. The Supervisory Committee membership should be submitted to and approved by the Program Executive within 60 days of the commencement of the program.
3. Students are expected to complete the Doctoral Research Proposal (APSC 7602) within 3-4 semesters of beginning the program. The proposal will consist of a written document and a public presentation, followed by an in camera session with the Examination Committee. The committee will examine the candidate's written proposal and determine the suitability of the proposal and aptitude of the student for research at the Ph.D. level. At this point, the Examination Committee will also determine whether the student has the required foundational knowledge of their field(s) and makes a list of required courses that the student should complete before undertaking the Qualifying Examination.
4. Students are expected to complete the Qualifying Examination (APSC 7603) within 7 semesters of beginning the program. The objective is to assess the student's ability to synthesize information across fields and potential to contribute to original research in their

field. More importantly, the Qualifying Examination determines whether the student is ready to begin writing the PhD thesis. The student must demonstrate appropriate breadth of knowledge and show an understanding of the applications of science to real-world problems in their area. The student will prepare written responses to two questions (one related to the research area of the student; one from an allied area) determined by the Examination Committee and submit the responses no later than seven (7) days after the questions were given. The student will be examined by the Examination Committee in camera who will consider primarily the content of the written responses and the student's answers to questions. The written responses will take the format of short review papers, synthesis or forum articles in peer-reviewed journals. On successful completion of this exam, the student will be considered a candidate for the Ph.D. in Applied Science. If the student is not successful, the Examination Committee will determine which components require revisions, and will re-examine the candidate within six (6) weeks. A second failure will result in the student being determined to be not in Good Academic Standing under Graduate Academic Regulation 30 (<https://smu-ca-public.courseleaf.com/graduate/academic-regulations/academic-standing/>) "Standing Required" and will be required to withdraw from the program.

5. Students must complete a Research Internship (APSC 7620) of at least 4 months duration before they finish the program.
6. Students must complete and defend a Doctoral Dissertation (APSC 7604) as the final requirement of the PhD program. The dissertation documents original research completed by the student and the bulk of this should be publishable in scientific literature. The format of the thesis (e.g. chapters as separate manuscripts versus traditional thesis) is to be determined by the Supervisory Committee. The dissertation will contain a section devoted to the description of the next steps that can be taken towards knowledge transfer. The "next steps" will vary depending on the nature of research. This requirement is distinct from the usual statements at the end of a Ph.D. dissertation indicating future research directions in that an outline of specific steps is required. This could include:
 - designs for further experiments,
 - field trials,
 - evidence of having consulted with professionals,
 - end-users or other recipients of knowledge transfer, or
 - campaigns for public outreach or extension.
 This "knowledge transfer plan" is equally important regardless of where the student's research falls along a continuum of fundamental to applied research. Students engaged in more fundamental research will be required to articulate next steps toward application of the research results, even if these are relatively distant from commercialization or other direct applications. The dissertation defense will consist of a public oral presentation, followed by questions from the public, then rounds of questioning by the Examination Committee. The questioning will be open to the public. The Examination Committee will assess the student's understanding of the completed work, including its context within the research field and potential applications of this work.
7. For the defense of the Doctoral Research Proposal and Qualifying Examination, the Examination Committee will consist of the supervisor, the supervisory committee and one external (external to the department of the primary supervisor). The same committee may be used for both the Doctoral Research Proposal defense and the Qualifying Examination. The Examination Committee for the

dissertation defense will consist of the supervisor, the supervisory committee, and one member from the related research community, but external to the University.

8. The student must meet with their Supervisory Committee in September beginning in their second and subsequent years to assess the student's progress in research and course work. The annual assessment should be submitted and approved by the Program Executive by September 30.
9. Students are required to fulfill the equivalent of three (3) years of full-time, on-campus residency (i.e. "minimum-time-for-completion"). All degree requirements must be completed within seven (7) years for full-time students (i.e. "maximum-time-for-completion") after entry into the PhD in Applied Science program. Students may not enter the program as part-time students. Per standard FGSR regulations and policies, students beyond their minimum-time-for-completion (i.e. in years 4-7 of their programs) will be considered, by default, part-time students. Students can apply for full-time status in years 4-7 of their programs, but they must meet the definition as a Full-Time Continuing Student, per Graduate Academic Regulation 8/b/(ii) (<https://smu-ca-public.courseleaf.com/graduate/academic-regulations/registration/>) as stated in the Graduate Academic Calendar