

Syracuse University



Department of Science Teaching

Doctoral Degree Programs

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Ph.D IN SCIENCE EDUCATION

Students with an interest in research and/or university teaching usually pursue the Ph.D. degree. Their programs emphasize intensive study in a major area of specialization and often a minor area as well, leading to the development or extension of theory and research in the major field.

To be considered for admission to a doctoral program in science education, students must submit a Graduate Application along with Graduate Record Examination General Test scores. Admission decisions are based on past academic records, GRE scores, letters of recommendation, and the personal statement that accompanies the application.

Applicants are strongly urged to meet with the Department of Science Teaching faculty members to discuss their needs, interests, and goals before deciding on which program to pursue.

Doctoral programs require several components:

1. filing the informal program of study
2. coursework requirements
3. preliminary “45- Hour” examinations
4. practicum/research requirements
5. qualifying examinations
6. admission to candidacy
7. filing of a formal program of study
8. dissertation preparation and oral defense

Ph.D. in SCIENCE EDUCATION

The following are general requirements for the Ph.D. program:

1. Your program of study must include at least 90 credits beyond the baccalaureate degree.
2. You must have a minimum of 45 credit hours in Science and Science Education (if you have a minor area, the minimum is 33). Your major area (Science and Science Education) may include courses drawn from science content and science education courses. Neither dissertation hours nor core requirements can be included in your major area.
3. Your program of study must include six credit hours of core requirements courses. The first three credits of these six must be EDU 781, "Institutions and Processes of Education." The second three credits may be EDU 782 or other courses approved for this purpose by the School of Education Assembly. To date, the following course has received Assembly endorsement:

EDU 815 Advanced Seminar in Qualitative Research
4. Your program of study must include 12 hours of research methods courses.
5. Your program of study must include 9-24 hours of dissertation credit.
6. A minor area is optional. If you elect to pursue a minor, you must select at least 15 hours in your minor area under the advisement of faculty in the minor area. You will be required to write Qualifying Exams in this area.
7. Limits on transfer credit: One-half of the credit hours submitted for your Ph.D., exclusive of dissertation credits, must be taken at Syracuse University as part of your planned doctoral program. Because total hours in a doctoral program frequently exceed the minimum 90 and because total dissertation credits are variable, the minimum credit to be taken at Syracuse University as part of the planned program, exclusive of the dissertation, is set at 36 credit hours.

GUIDELINES FOR EXEMPTION FROM EDU 781

Within each profession there are competing views of what constitutes good practice. There is controversy not only about the best way of solving specific problems, but also about how to define the problems, what will count as their solution, and what role the practitioner should play in solving them. The views of communities of practitioners about these questions are shaped by the cultural and historical contexts of their practice, as well as by competing paradigms within the profession.

The main goal of EDU 781 is to encourage students to further develop their own historical and professional paradigms that have influenced contemporary educational thought.

Therefore, students seeking exemption from EDU 781 should present evidence that they have already achieved this goal. More specifically, they should show that they have met the following objectives:

- A. Students should demonstrate knowledge of different models of desirable professional practice in education. Relevant topics included:
1. Models of the professions and their place in society
 - the social meaning of the professions
 - the relationship between theory and practice
 - the nature of the client-professional relationship
 - the professional's role in society
 - the institutional contexts conducive to professional practice
 2. Political, social, and moral ideals that are used to guide and justify professional activity in education.
 3. Competing paradigms in the student's own area of expertise or in education more generally. This knowledge of alternative models might have been developed through historical case studies, comparative analysis, or close examination of disputes within the student's area of expertise, or preferably, through a combination of these ways. Through these studies, a student should have developed a critical perspective about professional practice in education.
- B. Students should have developed their own point of view in relationship to the alternatives described in the first objective and should be able to apply their views to the analysis of problems within their own areas of expertise or in education generally.
- C. Students should demonstrate knowledge of the cultural, historical, and professional contexts that have influenced the models referred to in the first two objectives.

In terms of traditional subjects of study, the student might show that these objectives have been met by pointing to work in philosophy of education, comparative education, and political and social philosophy. It would, of course, not be necessary to have taken courses specifically focused on these areas. Students might have done relevant work as units in a variety of courses. Course syllabi and/or papers written by the student might be used to demonstrate mastery of the objectives.

Students who believe that they qualify for exemption under these guidelines should submit their petitions and supporting materials to the Higher Degrees Committee that will evaluate each case.

REQUIREMENTS FOR METHODS OF RESEARCH AND/OR SCHOLARLY INQUIRY

As a graduate of a university that emphasizes research and other forms of scholarly inquiry, you should be able to demonstrate your competence in research methods appropriate to your career path and exhibit functional familiarity with other commonly used research methodologies. Faculty in the school of Education expects all doctoral students to: understand the different conceptions of social sciences; be able to conduct and report research and/or other forms of scholarly inquiry, understand the process by which the results of research and/or scholarly inquiry contribute to a particular body of knowledge.

Ph.D. students are required to take at least 12 hours of research methodology courses. The assumption is made that those studying for the Ph.D. will seek positions in research universities where they will be expected both to engage in their own research and/or other forms of scholarly inquiry as well as serve on the committees of students doing dissertations. Such individuals should, therefore:

1. Have a depth of competence in at least one research methodology relevant to the area for which they are preparing, sufficient that they can both critique and carry out such work with facility and excellence. Their own dissertation should use that methodology. If it does not, then preparation in the dissertation's method is also necessary.
2. Acquire receptive literacy in both qualitative and quantitative research methods in their area of expertise so that they are able to appropriately critique various types of research.

The minimal requirement of 12 research credits is usually best met by completing EDU 603 and EDU/EDP 647 plus six additional credits selected to develop further expertise appropriate to your dissertation and postdoctoral work. The EDU 603 and EDU/EDP 647 core prepares students to understand the different conceptions of the social sciences, be able to conduct and report research and/or other forms of scholarly inquiry, understand the criteria used to judge the finding of research and/or other forms of scholarly inquiry, and understand the process by which the results contribute to a particular body of knowledge or practice. The core will introduce you to qualitative, survey, and experimental methodologies, as well as beginning statistics. However, as it does not provide sufficient depth for real competence in any of these areas, you must select six additional credits, with the guidance of your advisor and the approval of the Higher Degrees Committee, in order to build competence in a selected methodology.

You may select research methods sequences with the approval of your advisor. A qualitative or quantitative emphasis may be selected with further study in the areas of research design, survey methods, and methods to conduct an evaluation. Additional alternative sequences may also be approved by the Higher Degrees Committee if a rationale is provided which demonstrates the appropriateness and coherence of the proposed course sequence.

On the following page is a checklist of the specific requirements you will need to fulfill, followed by a more detailed explanation of each step.

Ph.D. CHECKLIST

Advisor _____ Advisor's Phone # _____

Dissertation Advisor _____ Phone # _____

Date completed and checked with Office of Academic Services (OAS)

- _____ **Informal Program of Study** submitted, signed by advisor in first semester
(attachment 3.0)
- _____ **Preliminary Memo** from advisor to OAS (after 45 hour review/exam)
- _____ **Formal Program of Study** plan submitted to OAS (attachment 3.1)
- _____ **Research Apprenticeship** registration form filed with OAS (attachment 3.3)
- _____ 12-hour **Research Apprenticeship** requirement completed
- _____ IRB proposal, if needed for Research Apprenticeship, approval letter to OAS
- _____ **Research Apprenticeship Report** filed with OAS (approval form/apprenticeship
paper filed by advisor)
- _____ Apply to take **Qualifying Exam** (attachment 3.4) no less than 2 weeks before the exam
- _____ **Qualifying Exam** results (per memo from advisor) to OAS
- _____ Establish Dissertation Committee
- _____ File 3 signed copies of the **Dissertation Proposal** (attachment 3.5) with OAS
- _____ **IRB Proposal** if required filed with Institutional Review Board, copy of approval sent to
OAS
- _____ Dissertation committee minutes filed with OAS
- _____ **Intent to Defend Doctoral Dissertation Notice** (attachment 3.6) approved by advisor
and submitted to OAS the semester before you intend to defend
- _____ **Request for Examination (Oral Defense)** (attachment 3.7) submitted to OAS no later
than 4 weeks prior to defense
- _____ Three copies of dissertation to Associate Dean's Secretary 3 weeks prior to defense
- _____ Contact GEMC for microfilming contract and fee information.
- _____ Dissertation successfully defended! OAS notified.
- _____ Two signed copies of completed dissertation & its abstract to Graduate School before
final day designated by Graduate School
- _____ **Diploma Request Card** filed with OAS in the beginning of the semester of the defense

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FILING YOUR INFORMAL PROGRAM

During the first semester after you've been admitted to the program, you, with the help of your advisor, should complete an Informal Program of Study form and submit it to the Graduate Recorder (270 Huntington Hall). The purpose of filing an informal plan so early in your doctoral career is to make sure that you've done some long-term thinking about your doctoral program before you've accumulated many course credits. Of course, this plan can and should be revised as you proceed with your studies.

In order to complete the form, you will need to meet with your advisor to determine such details as the number of courses you will be able to transfer into your program, when you will complete your core courses, what you will do for a practicum experience and when you will do it, etc.

Don't wait for your advisor to initiate a meeting about your informal plan. You should initiate this meeting.

PRELIMINARY EXAMINATION: ADMISSION TO DOCTORAL CANDIDACY

At the end of your first semester of full time study, or upon completion of your 45th hour of course work beyond the bachelor's degree (at least 15 of which must be earned at Syracuse University), you will be considered for candidacy for the doctoral degree.

Admission to candidacy is granted by the Committee on Higher Degrees after it has reviewed the results of a preliminary review (45-hour exam) prepared by faculty in your major area. After this review, it is your responsibility to make sure that your advisor sends a letter to the Higher Degrees Committee via the Graduate Recorder stating that you have satisfactorily passed your 45-hour review. If you don't complete this requirement by the time you've completed your 45th hour, your right to continue in the program may be jeopardized.

FILING YOUR FORMAL PROGRAM

In the semester prior to applying to take your qualifying examinations, you must file your Formal Program of Study plans. One of these is a form for the School of Education, and the other is a more abbreviated form for the Graduate School. Your Formal Plan of Study, presented in the two formats, must be approved by your advisor and by the Higher Degrees Committee. Once the program is approved, it, unlike the informal program you submitted in your first semester, must be amended by petition if changes need to be made. It is your responsibility to develop this plan in conjunction with your advisor and to submit it for approval.

RESEARCH APPRENTICESHIP REQUIREMENT

Ph.D. students must complete a research apprenticeship prior to work on the doctoral dissertation. You must submit a completed research document in publishable format to the Higher Degrees Committee before you apply to take your Qualifying Examination.

The research apprenticeship is usually supervised by a sole faculty member who is either your program advisor or another member of the faculty. It is your responsibility, in consultation with your advisor, to arrange the apprenticeship experience. Some students complete the research apprenticeship experience within the context of a regular course (in which case the course instructor sponsors the apprenticeship). Other students contract with their sponsor for an independent study course carrying 3 to 6 hours. Still others conduct the apprenticeship without any formal hours attached to it.

Obtaining advance agreement on who will be sponsoring your research apprenticeship and on authorship with that sponsor, should the research apprenticeship report be published, are important steps in the planning process.

After approval by your sponsor, three copies of your apprenticeship report must be submitted to the Graduate Recorder who sends the copies on to the Research Committee for review. The report is to be written as a research document in publishable format, according to the “style sheet” for a specified journal. The report, however, should not exceed 30 double-spaced typed pages.

You can obtain a full description and specification of procedures and standards for the report from a document prepared by the Research Committee entitled *The Research Apprenticeship*. This document, available from the Graduate Recorder, also provides a current list of faculty who are willing to sponsor students for a research apprenticeship and their own research interests.

THE QUALIFYING EXAMINATION

You will take the Qualifying Examination when you have completed between 69 and 75 hours. This exam covers the major field (Science Education) and, if applicable, the minor. For candidates who designate a minor area, the exam totals four one-half days in the major field and two one-half days in the minor.

The academic area faculty administers the exam. You must file an application with the chairperson of the Higher Degrees Committee to take the exam. Applications will be accepted only from candidates who have filed a registered program in a semester prior to the administration of the examination and have submitted their practicum report. You must submit your application to the Graduate Recorder prior to the administration of the examination.

The examination in the major area may be written and/or oral. The exam is prepared and evaluated by a committee consisting of your advisor and at least one other person of professional rank (your division may have other requirements as well). ***Your advisor must report the results of your exam to the Graduate Recorder for the Higher Degrees Committee.*** It's a good idea to remind your advisor to submit these results.

The examination in the minor area is prepared and evaluated by faculty in the area specified. The process of preparing the minor area exam and reporting the results are the same as for the major area.

The Higher Degrees Committee considers examinations in the major and minor areas separately. It is possible for a candidate to pass one, but not the other. All examinations must be passed within a two-year period. If any area is failed twice, the advisor may recommend additional courses before the third trial. A candidate who fails the major or the minor area three times will be removed from the list of doctoral candidates.

THE DISSERTATION

The doctoral dissertation must be developed following these guidelines:

THE DISSERTATION COMMITTEE

A dissertation committee composed of at least three Syracuse University faculty members must be approved by the director of the Division for the Study of Teaching. Your dissertation advisor does not need to be your program advisor, but at least one member of the committee must have faculty status in your program area.

THE PROPOSAL

After passing the Qualifying Examination, you should submit three (3) copies of your proposal with the Higher Degrees Committee (via the Graduate Recorder). Approval of your proposal will be in accordance with procedures established by the Division for the Study of Teaching and by the Higher Degrees Committee.

The dissertation proposal should include:

1. A clear statement as to the nature of the problem and why it is worthy of study as a doctoral investigation;
2. The kinds of data needed;
3. How you are going to obtain these data;
4. How you are going to deal with the data you've obtained;
5. The nature and significance of the contribution which the dissertation may make to the field of education.

INTENT TO DEFEND NOTICE

File a Notice of Intent to Defend Doctoral Dissertation form at **least one semester before you intend to schedule the oral defense of your dissertation**. This form alerts the Office of Academic Services to determine interest among the faculty in serving as a reader for your oral defense.

Oral examinations are scheduled in three time periods during the calendar year. You should register your intent to schedule an examination by *August 15* for a fall semester date, by *December 1* for the spring semester, and by *April 15* for either of the two summer sessions.

STUDIES INVOLVING HUMAN SUBJECTS

University policy requires that all proposals for activities which will involve the use of human subjects be reviewed by the Institutional Review Board for Use of Human Subjects in Research (IRB) to assure that the rights and privileges of the subjects are protected. Further, the University has entered into an institutional agreement with the Department of Health and Human Services to that effect. However, the University's concern extends to all proposals regardless of whether the sponsoring agency is a part of the Department of Health and Human Services or not.

If dissertation proposal involves the use of human subjects, you must submit to the University's Institutional Review Board ten (10) copies of the substantive portion of the proposal (budgets, bibliographies, biographies, etc. are not necessary). You must complete and attach to the proposal a human subjects questionnaire, copies of which are available from the Secretary, Committee on the Investigation of Research Involving Human Subjects, Merrill Lane. This questionnaire must be signed by your advisor. The 10 copies of your proposal, plus the completed questionnaire must be returned to the same office where they will be distributed to the committee members.

Committee members must have the questionnaire and the proposal well in advance of the Human Subjects Committee meeting so that they can be completely familiar with it. Since their meetings are scheduled for the third Monday of the month, materials should reach the Institutional Review Board no later than noon of the second Wednesday of the month.

You should be sure to include approval from the IRB when you submit your proposal to the School of Education's Higher Degrees Committee.

COMMITTEE MEETING

After filing your approved proposal, you may begin to collect data or otherwise execute the proposed research. During the period of collecting and analyzing data and writing your dissertation, you should meet with your dissertation committee as frequently as possible, but you must do so at least once between the time your proposal has been accepted and your final oral examination. You must write a brief paragraph summarizing the suggestions and decisions made at this meeting. The note must be dated and signed by everyone at the meeting, and filed with the Graduate Recorder to become a part of your permanent record (this record is checked before your oral defense is scheduled).

DISSERTATION STYLES

The conventional format of dissertations submitted to the faculty in Education at Syracuse University follows the *Chicago Manual of Style*. Manuscript form detailed in the *Publication Manual of the American Psychological Association* is also approved for use by School of Education students. A summary of some of the more frequent style problems has been published by Turabian in *A Manual for Writers of Dissertations* (available at the SU Bookstore).

Formats not specified in the references above should be approved by the Graduate School. Whatever the format, all dissertations are expected to observe the conventions of standard (edited) English.

A booklet entitled *Instructions for the Preparation of Theses and Dissertations* prepared by the Graduate School of Syracuse University is available from the Graduate Recorder in 270 Huntington Hall.

THE ORAL EXAMINATION

When your dissertation is approved by your advisor and every other member of your committee, you must submit the Request for Oral Examination form four weeks prior to your chosen defense date. You and your dissertation committee set the date of the oral defense.

You'll need to bring three completed copies of your dissertation to 270 Huntington Hall three weeks before your defense date to allow time for review by the readers.

The Chair of the Higher Degrees Committee appoints two faculty members to serve as readers of the dissertation. Readers submit written reviews 48 hours before the scheduled oral examination. One copy of the reader's review goes to the Associate Dean's Secretary, 270 Huntington Hall and one copy goes to your dissertation advisor who will share it with you and your whole committee.

The Graduate School appoints a representative of the Graduate Board from outside the School of Education as a chairperson for your defense. You are examined on your dissertation and on your field of specialization by the three members of your committee and the two readers. Your dissertation is passed if four of these five people approve your defense. One of the affirmative votes must come from a reader. Ordinarily, the chairperson of the oral examination does not vote.

It is not unusual for candidates to be passed with the provision that the Dissertation Committee supervise any corrections or additions to the final draft of the dissertation. Corrections to the dissertation for acceptance must be completed and approved two weeks prior to your proposed graduation date.

FINAL SUBMISSION OF YOUR DISSERTATION

Two complete copies of the approved version of your dissertation, along with its abstract, both signed by your advisor, must be submitted to the Graduate School prior to the final day of the graduation period. The abstract must not exceed 350 words.

You must pay a fee to the Bursar's Office to cover the cost of publishing the abstract in Dissertation Abstracts and microfilming the entire dissertation. One positive microfilm copy is sent to the Library of Congress and a second copy is sent to SU's Bird Library. The microfilm negative is kept in the archives of University microfilms, Ann Arbor, Michigan. The original copy of the dissertation is bound and kept in Bird Library.

Ph.D. in COLLEGE SCIENCE TEACHING

This program is for those who plan to teach undergraduate courses in the sciences or mathematics in a junior college, small liberal arts college, or university. The program leads to a Ph.D. in general science and offers:

1. broad training concentrated in the sciences;
2. a combination of breadth, specialization, and integration in the sciences;
3. supervised college teaching experience in the candidate's science specialty, either at Syracuse University or at another college in the Syracuse vicinity;
4. seminars in curriculum development and methods of teaching science in higher education;
5. research focused on the problems of college teaching.

Representatives of the departments of the major and the minor science areas comprise the committee which guides the student's program. An adviser is designated during the first year of study.

ADMISSION

Applicants must meet the requirements for admission to the Graduate School and must hold a bachelor's degree in a science field or in science education. Students with a master's degree in a science field, but no college teaching experience are also eligible.

PROGRAM REQUIREMENTS

The degree requires a total of 90 credits, of which a minimum of 18 must be for the dissertation. At least 54 credits of graduate courses in science and/or mathematics beyond the bachelor's degree are also required. Programs are planned individually so that each student specializes and develops teaching competence in one science field. In addition, the student must take a minor in another science field. The number of credits required is determined by the student's academic background.

The following courses, which constitute a foundation area, are also required:

Philosophy of Science	3 credits
Methods of Teaching Science in Higher Education	3 credits
Higher Education	3 credits

One research tool must be selected from the following areas: a foreign language (French, German, Spanish, Russian); statistics; or computer programming. The language requirement can be satisfied by a departmental examination or the ETS examination if one is offered. Statistics and computer programming requirements are satisfied by taking a prescribed core of courses in these areas and obtaining a grade of **B** or better in each course.
