Teaching and Learning, Ph.D.

Ph.D. Required Research Courses

Students admitted to doctoral programs must complete the program's research requirements.

Required Core Courses

All Ph.D. students in the Department of Teaching and Learning must complete one or both of the following core courses, depending upon program requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7004</td>
<td>Schooling in the United States</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7033</td>
<td>Seminar on Teacher Education</td>
<td>3</td>
</tr>
</tbody>
</table>

Required Cognates

All Ph.D. students in the Department of Teaching and Learning must complete two approved cognate areas as part of their doctoral study plan. Most comprehensive exams in the department are designed to cover the student's core area plus two cognate areas, so selection of cognate areas is important. Cognates also may enhance students' employment possibilities, since they represent a minor area of study.

The following list of cognates offered by program areas in the department is not exhaustive; students may select cognates from this list, or they may customize their own cognate areas in consultation with their advisors.

Foreign Language and ESL Education

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>This course:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDTL:6483</td>
<td>Second Language Classroom Learning</td>
<td>3</td>
</tr>
<tr>
<td>Two of these, chosen in consultation with faculty:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDTL:6400</td>
<td>Fundamentals of Second Language Assessment</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6402</td>
<td>Second Language Program Management</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6403</td>
<td>Language Policy and Planning</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6409</td>
<td>Cultural Curriculum</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6480</td>
<td>Issues in Foreign Language Education</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6484</td>
<td>Reading in a Second Language</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6497</td>
<td>Principles of Course Design for Second Language Instruction</td>
<td>3</td>
</tr>
</tbody>
</table>

Gifted Education

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative Strand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two of these, chosen in consultation with faculty:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPLS:4110</td>
<td>Administration and Policy in Gifted Education</td>
<td>2</td>
</tr>
<tr>
<td>EPLS:4111</td>
<td>Evaluation of Gifted Programs</td>
<td>1</td>
</tr>
<tr>
<td>EPLS:4113</td>
<td>Staff Development for Gifted Programs</td>
<td>1</td>
</tr>
</tbody>
</table>

Programming Strand

Both of these:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:4066</td>
<td>Curriculum Concepts in Gifted Education</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:4199</td>
<td>Program Models in Gifted Education</td>
<td>3</td>
</tr>
</tbody>
</table>

Psychology Strand

Two of these, chosen in consultation with faculty:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCE:4120</td>
<td>Psychology of Giftedness</td>
<td>3</td>
</tr>
<tr>
<td>RCE:4121</td>
<td>Identification of Students for Gifted Programs</td>
<td>3</td>
</tr>
<tr>
<td>RCE:4137</td>
<td>Introduction to Educating Gifted Students</td>
<td>3</td>
</tr>
<tr>
<td>RCE:5226</td>
<td>Assessment of Giftedness</td>
<td>3</td>
</tr>
<tr>
<td>RCE:5237</td>
<td>Seminar in Gifted Education</td>
<td>3</td>
</tr>
</tbody>
</table>

Global Education

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:6840</td>
<td>Theories and Perspectives in Global Education</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6841</td>
<td>Attaining a Global Perspective</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6842</td>
<td>Examining Power, Resistance, and Change Through Global Education</td>
<td>3</td>
</tr>
</tbody>
</table>

Language, Literacy, and Culture

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both of these:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDTL:7015</td>
<td>Ph.D. Seminar in Language, Literacy, and Culture (when topic is introduction to language, literary, and culture)</td>
<td>arr.</td>
</tr>
<tr>
<td>EDTL:7015</td>
<td>Ph.D. Seminar in Language, Literacy, and Culture (topic chosen in consultation with advisor)</td>
<td>arr.</td>
</tr>
</tbody>
</table>

General Emphasis

This course:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7008</td>
<td>Seminar: Research and Current Issues (topic chosen in consultation with advisor)</td>
<td>arr.</td>
</tr>
</tbody>
</table>

Elementary Emphasis

One of these:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:6104</td>
<td>Literature for Children II</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6164</td>
<td>Early Literacy Development and Instruction</td>
<td>2-3</td>
</tr>
<tr>
<td>EDTL:6165</td>
<td>Reading and Writing Across Intermediate Grades</td>
<td>3</td>
</tr>
</tbody>
</table>

Secondary Emphasis

One of these:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:3393</td>
<td>Reading and Teaching Adolescent Literature</td>
<td>3</td>
</tr>
</tbody>
</table>
EDTL:6315  M.A. Seminar: English Education  arr.

Mathematics Education

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:5535</td>
<td>Current Issues in Mathematics Education</td>
<td>1-3</td>
</tr>
<tr>
<td>EDTL:7535</td>
<td>Seminar: Research in Mathematics Education</td>
<td>arr.</td>
</tr>
</tbody>
</table>

Two of these:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:6531</td>
<td>Technology in School Mathematics</td>
<td>2-3</td>
</tr>
<tr>
<td>EDTL:6534</td>
<td>Foundations of Mathematics Education</td>
<td>2-3</td>
</tr>
<tr>
<td>EDTL:6536</td>
<td>Teaching of Geometry</td>
<td>2-3</td>
</tr>
<tr>
<td>EDTL:6539</td>
<td>Teaching of Algebra</td>
<td>2-3</td>
</tr>
</tbody>
</table>

Science Education

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:6757</td>
<td>Learning in the Science Classroom</td>
<td>2-3</td>
</tr>
<tr>
<td>EDTL:6759</td>
<td>Advanced Pedagogy</td>
<td>3</td>
</tr>
</tbody>
</table>

Special Education

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7040</td>
<td>Advanced Topics in Teaching and Learning</td>
<td>arr.</td>
</tr>
<tr>
<td>EDTL:7945</td>
<td>Current Issues and Trends in Learning Disabilities</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7948</td>
<td>Contemporary Research in Behavioral Disorders</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7953</td>
<td>Seminar: Single Subject Design Research</td>
<td>3</td>
</tr>
</tbody>
</table>

Foreign Language and ESL Education

The Doctor of Philosophy in teaching and learning with a foreign language and English as a Second Language (ESL) education subprogram requires a minimum of 80 s.h. of graduate credit. The program provides students with the necessary content-area knowledge and research skills for independent research, program administration, and varied leadership positions in foreign language and ESL education. It is designed for individuals who have demonstrated success in foreign language and ESL teaching and who wish to prepare for positions in academia, government, or the private sector where in-depth knowledge of foreign language educational issues is required.

Most courses for the Ph.D. should be numbered 5000 or above. At least 30 s.h. must be taken in the core area of foreign language education. Students and their advisor discuss core area course work and cognate area specializations. Their progress toward the degree and their scholarship development is reviewed by the program's faculty and discussed by students and their advisor each year.

The Ph.D. in teaching and learning with a foreign language and ESL education subprogram requires the following course work. Students may be able to count some courses completed for the master's degree toward the 80 s.h. required for the Ph.D.

Required Courses

Foreign Language Education Core

Students must complete the following (21 s.h.).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:6400</td>
<td>Fundamentals of Second Language Assessment</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6403</td>
<td>Language Policy and Planning</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6409</td>
<td>Cultural Curriculum</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6483</td>
<td>Second Language Classroom Learning</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6484</td>
<td>Reading in a Second Language</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6497</td>
<td>Principles of Course Design for Second Language Instruction</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7406</td>
<td>Proposal Writing for Second Language Research</td>
<td>3</td>
</tr>
</tbody>
</table>

Students must complete both of the following Ph.D. core courses.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7004</td>
<td>Schooling in the United States</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7033</td>
<td>Seminar on Teacher Education</td>
<td>3</td>
</tr>
</tbody>
</table>

Core Electives

Students may take the following courses in addition to, but not instead of, the courses listed under "Foreign Language Education Core" above. Students must have their advisor's consent to substitute other courses as electives.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:6402</td>
<td>Second Language Program Management</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6480</td>
<td>Issues in Foreign Language Education</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7015</td>
<td>Ph.D. Seminar in Language, Literacy, and Culture (when topic is relevant)</td>
<td>arr.</td>
</tr>
<tr>
<td>SLA:6920</td>
<td>Multimedia and Second Language Acquisition</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition, students must complete an approved cognate area; see "Required Cognates" under Ph.D. Required Research Courses [p. 1] in this section of the Catalog.

The program requires 16 s.h. of course work in research methods. Three courses must be taken from the "First Tier Requirements" list, and two courses must be taken from the "Second Tier Requirements" list. Students who have little experience with social/behavioral sciences research methods when they enter the program may be advised to take remedial course work in research methods, which does not count toward the 16 s.h. requirement.

First Tier Requirements

These courses should be taken in the first two years of study (10 s.h.).
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both of these:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDTL:7405</td>
<td>Research Methods in Second Language Teaching and Learning</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6243</td>
<td>Intermediate Statistical Methods</td>
<td>4</td>
</tr>
<tr>
<td>One of these:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDTL:7070</td>
<td>Introduction to Qualitative Methods in Literacy Research</td>
<td>3</td>
</tr>
<tr>
<td>EPLS:7373</td>
<td>Qualitative Research Design and Methods</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:7331</td>
<td>Seminar: Educational Psychology I - Current Topics (when topic is qualitative educational research methods)</td>
<td>3</td>
</tr>
<tr>
<td>RCE:7338</td>
<td>Essentials of Qualitative Inquiry</td>
<td>3</td>
</tr>
</tbody>
</table>

**Second Tier Requirements**

Two additional research methods courses should be chosen in consultation with a student's advisor. These courses should be taken after the first tier courses have been completed (6 s.h.).

**Advanced Qualitative Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7071</td>
<td>Critical Discourse Analysis in Educational Research</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7072</td>
<td>Advanced Methods of Literacy Research: Qualitative Data Analysis and Reporting</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7073</td>
<td>Ethnographic Methods, Theories, and Texts</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7751</td>
<td>Advanced Qualitative Data Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

**Advanced Research Design Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7410</td>
<td>Mixed Methods Research</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6265</td>
<td>Program Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:7331</td>
<td>Seminar: Educational Psychology I - Current Topics (when topic is conducting research online)</td>
<td>arr.</td>
</tr>
</tbody>
</table>

**Advanced Quantitative Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPLS:6206</td>
<td>Research Process and Design</td>
<td>3</td>
</tr>
<tr>
<td>EPLS:6209</td>
<td>Survey Research and Design</td>
<td>3</td>
</tr>
<tr>
<td>EPLS:6370</td>
<td>Quantitative Methods for Policy Analysis</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6244</td>
<td>Correlation and Regression</td>
<td>4</td>
</tr>
<tr>
<td>PSQF:6246</td>
<td>Design of Experiments</td>
<td>4</td>
</tr>
<tr>
<td>PSQF:6247</td>
<td>Nonparametric Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6249</td>
<td>Factor Analysis and Structural Equation Models</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6252</td>
<td>Introduction to Multivariate Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6255</td>
<td>Construction and Use of Evaluation Instruments</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6257</td>
<td>Educational Measurement and Evaluation</td>
<td>3</td>
</tr>
</tbody>
</table>

**Remedial Course Work**

These courses may be required if a student is not familiar with research methods in social/behavioral sciences.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EALL:5150</td>
<td>Introduction to Educational Research</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:4143</td>
<td>Introduction to Statistical Methods</td>
<td>3</td>
</tr>
</tbody>
</table>

**Comprehensive Examination**

In order to qualify to take the comprehensive examination, students must successfully complete the required course work and an extended research activity. After successful completion of the required course work and the research activity, and upon recommendation of the program's faculty, a student is eligible to sit for the comprehensive examination. Completion of the required course work and research activities does not guarantee advancement to the examination.

After passing the comprehensive examination, students consult with their advisor to choose a Ph.D. dissertation committee of at least five faculty members, who approve the dissertation proposal. The student then conducts research under the primary guidance of the advisor.

**Admission**

Applicants must meet the admission requirements of the Graduate College. They should have at least two years of experience teaching foreign language or ESL and should hold a master's degree or have completed a significant amount of graduate course work in a foreign language or foreign language education. Applicants must have a g.p.a. of at least 3.00 in graduate course work. International applicants whose first language is not English must score at least 100 (internet-based) on the Test of English as a Foreign Language (TOEFL) with a speaking score of 26 and a writing score of 25.

Application materials should include a statement of purpose explaining the applicant's professional goals, transcripts of all undergraduate and graduate work, Graduate Record Exam (GRE) General Test scores, a sample of academic writing, and three letters of recommendation.

**Language, Literacy, and Culture**

The Doctor of Philosophy in teaching and learning with a language, literacy, and culture subprogram requires a minimum of 88-90 s.h. of graduate credit. The program brings together scholarly traditions and contemporary theory in literacy and cultural studies. Course work provides a broad background in relevant theoretic and research literature and opportunities to conduct original studies that explore the nature of literacy practices both in and out of school. Graduates find employment in university and college teaching, research, curriculum development, and administration of literacy programs.
Required Courses

Students complete an introductory seminar in language, literacy, and culture; at least 9 s.h. of additional doctoral seminars in the program; approved cognate areas (see “Required Cognates” under Ph.D. Required Research Courses [p. 1] in this section of the Catalog); and 9-12 s.h. of graduate course work outside the Department of Teaching and Learning with 6 s.h. of those outside the College of Education. Students also earn 10-12 s.h. of dissertation credit.

Students must complete at least 18 s.h. in research course work.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7070</td>
<td>Introduction to Qualitative Methods in Literacy Research</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6243</td>
<td>Intermediate Statistical Methods</td>
<td>4</td>
</tr>
</tbody>
</table>

Additional semester hours as outlined below:

A sequence of courses that meets the specific research interests of a student (selected in consultation with an advisor and the language, literacy, and culture faculty)

Semester hours may be taken in any combination of qualitative, quantitative, or other relevant research paradigms

Courses may be taken either within or outside of the College of Education

It is recommended that students take EALL:5150 Introduction to Educational Research (3 s.h.) early in their programs of study

And, students complete one of these core courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7004</td>
<td>Schooling in the United States</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7033</td>
<td>Seminar on Teacher Education</td>
<td>3</td>
</tr>
</tbody>
</table>

Comprehensive Examination and Dissertation

As students near the completion of their course work, they identify several key strands for review and synthesis. With guidance from their advisors, students prepare for three forms of written and oral exams: they answer take-home questions in two areas of literacy; they submit a substantive issues paper, typically a report of an exploratory study or a review of research literature on a topic of special interest; and they design a syllabus for a literacy course and write a reflective commentary that demonstrates understanding of the relationship between theory and practice.

Following successful completion of all components of the comprehensive exam, students work with a faculty member to develop a proposal for a study that will make an original contribution to the understanding of some aspect of literacy. After the proposal has been approved, students conduct research and report their findings under the primary guidance of a dissertation chair.

For detailed information, see Language, Literacy, and Culture on the Department of Teaching and Learning website.

Admission

Applicants must meet the admission requirements of the Graduate College. They should have at least three years of experience teaching or tutoring language or literacy (reading, writing, English, language arts) and should have earned a master’s degree in a literacy-related field. Application materials should include a statement of purpose explaining the applicant’s reasons for pursuing graduate study and describing future goals; transcripts of all undergraduate and graduate course work; Graduate Record Exam (GRE) General Test scores; a sample of academic writing; and three letters of recommendation.

Applications for admission and for financial aid are reviewed December 1 each year.

Mathematics Education

The Doctor of Philosophy in teaching and learning with a mathematics education subprogram requires a minimum of 80-90 s.h. of graduate credit. Students must have a cumulative g.p.a. of 3.00 or higher in all graduate work in mathematics, all University of Iowa graduate work in mathematics, all graduate work, and all University of Iowa graduate work.

The program prepares supervisors, teacher education personnel, community college personnel, and researchers in mathematics education. It is administered by the College of Education. Students must update graduate course work completed more than 10 years before admission to the program.

The Ph.D. program in teaching and learning with a mathematics education subprogram requires the following course work.

Required Courses

Students must complete EALL:5150 Introduction to Educational Research during the first year of their Ph.D. program. They also must complete an additional minimum of 15 s.h. in qualitative and quantitative course work, with at least 9 s.h. from one area (qualitative or quantitative) and at least 6 s.h. from the other. Students select from courses listed under Ph.D. Research Requirements on the College of Education website.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7004</td>
<td>Schooling in the United States</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7033</td>
<td>Seminar on Teacher Education</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition, students must complete an approved cognate area; see "Additional Requirements" below.

Students must complete a minimum of 24 s.h. of graduate work in the Departments of Computer Science, Mathematics, and Statistics and Actuarial Science, as approved by their advisor. Electives are encouraged in the pure mathematics and applied mathematics sequences.

Students who completed their mathematics requirement at another institution must complete at least 6 s.h. of additional course work in mathematics at the University of Iowa, chosen with advisor approval. They also must complete at least six
courses in mathematics education, including EDTL:5535 Current Issues in Mathematics Education and EDTL:7535 Seminar: Research in Mathematics Education.

Additional Requirements

Students concentrate in two additional comprehensive examination areas in either the mathematical sciences or education. A minimum of three courses usually are required for a comprehensive examination area, but candidates should consult with faculty members in the areas selected to determine which courses they should take in order to adequately prepare for the examinations.

Students must complete a total of at least 36 s.h. in College of Education courses; this includes the course work listed above. They must complete an approved cognate area; a partial list of potential cognate areas is available from the mathematics education program.

Comprehensive Examination

Students take three written comprehensive examinations, one in mathematics education and two in other fields of education or mathematics; an oral examination follows the written examinations.

Dissertation

Students must earn 10 s.h. of dissertation credit in EDTL:7493 Ph.D. Thesis. Each candidate completes a dissertation on a research problem in mathematics education. A prospectus of the proposed research must be presented to the dissertation committee before the candidate undertakes the study. Upon completion of the dissertation, the candidate defends the dissertation in an oral examination.

Admission

Applicants must meet the admission requirements of the Graduate College. They must have an undergraduate major in mathematics or the equivalent, a current teaching license/certificate, and at least two years of teaching experience are strongly preferred. A faculty review committee makes admission decisions.

Core Courses

All doctoral students in science education must complete one or both of the following core courses. Students may not substitute other courses for these.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7004</td>
<td>Schooling in the United States</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7033</td>
<td>Seminar on Teacher Education</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition, all doctoral students in the Department of Teaching and Learning must complete an approved cognate area; see "Required Cognates" under Ph.D. Required Research Courses [p. 1] in this section of the Catalog.

Science Education

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:6757</td>
<td>Learning in the Science Classroom</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6759</td>
<td>Advanced Pedagogy</td>
<td>3</td>
</tr>
</tbody>
</table>

Graduate-level science education courses chosen in consultation with advisor

Education

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EALL:5150</td>
<td>Introduction to Educational Research</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6200</td>
<td>Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6275</td>
<td>Constructivism and Design of Instruction</td>
<td>3</td>
</tr>
</tbody>
</table>

Research in Science Education

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7750</td>
<td>Seminar: Science Education (taken three times for 1 s.h. each)</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7755</td>
<td>Independent Study in Science Education Research (taken six times for 3 s.h. each)</td>
<td>18</td>
</tr>
</tbody>
</table>

Science Area

Students complete a family of courses (total of 12 s.h.) in a major science area.

Dissertation

Students earn 10 s.h. of thesis credit in EDTL:7493 Ph.D. Thesis.

Admission

Applicants must meet the admission requirements of the Graduate College. They should have completed a bachelor's degree in a science area (or combination of science areas), in science education, or in elementary education with a science emphasis; have a cumulative g.p.a. of at least 3.00 on undergraduate and graduate work; and have a combined score of at least 300 on the verbal and quantitative portions of the Graduate Record Exam (GRE) General Test. Applicants
must submit three letters of recommendation; a statement of purpose describing their reasons for pursuing graduate work and their goals for graduate study; and an example of their academic writing.

Social Studies Education

The Doctor of Philosophy in teaching and learning with a social studies education subprogram requires a minimum of 90 s.h. of graduate credit. The program prepares secondary department chairs, supervisors, curriculum directors, teacher education personnel, and college instructors in the social sciences and in social studies education.

The required 90 s.h. of credit includes course work and the dissertation (10 s.h.).

Required Courses

Students are required to complete 16 s.h. of course work focused on research methodology.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSQF:6243</td>
<td>Intermediate Statistical Methods</td>
<td>4</td>
</tr>
<tr>
<td>EDTL:7070</td>
<td>Introduction to Qualitative Methods in Literacy Research</td>
<td>3</td>
</tr>
<tr>
<td>EPLS:7373</td>
<td>Qualitative Research Design and Methods</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:7331</td>
<td>Seminar: Educational Psychology I - Current Topics (when topic is qualitative educational research requirements)</td>
<td>arr.</td>
</tr>
<tr>
<td>RCE:7338</td>
<td>Essentials of Qualitative Inquiry</td>
<td>3</td>
</tr>
</tbody>
</table>

In consultation with advisor, 9 s.h. of research methodology course work appropriate to dissertation design from these:

**Qualitative Methodology**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7071</td>
<td>Critical Discourse Analysis in Educational Research</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7073</td>
<td>Ethnographic Methods, Theories, and Texts</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7410</td>
<td>Mixed Methods Research</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7751</td>
<td>Advanced Qualitative Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7953</td>
<td>Seminar: Single Subject Design Research</td>
<td>3</td>
</tr>
<tr>
<td>EPLS:5240</td>
<td>Topics in Education (when topic is introduction to historical methodology)</td>
<td>arr.</td>
</tr>
<tr>
<td>PSQF:6265</td>
<td>Program Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>RCE:7444</td>
<td>Qualitative Research in the Multicultural Context</td>
<td>3</td>
</tr>
</tbody>
</table>

**Quantitative Methodology**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPLS:6206</td>
<td>Research Process and Design</td>
<td>3</td>
</tr>
<tr>
<td>EPLS:6209</td>
<td>Survey Research and Design</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6220</td>
<td>Quantitative Educational Research Methodologies</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6244</td>
<td>Correlation and Regression</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSQF:6246</td>
<td>Design of Experiments</td>
<td>4</td>
</tr>
<tr>
<td>PSQF:6247</td>
<td>Nonparametric Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6249</td>
<td>Factor Analysis and Structural Equation Models</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6252</td>
<td>Introduction to Multivariate Statistical Methods</td>
<td>3</td>
</tr>
</tbody>
</table>

Students that want to take a course that is not listed above to receive credit toward their program requirements must obtain prior approval from their advisor and from the social studies education program.

Core Courses

In addition, students must complete one or both of the following core courses.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7004</td>
<td>Schooling in the United States</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7033</td>
<td>Seminar on Teacher Education</td>
<td>3</td>
</tr>
</tbody>
</table>

Social Studies Education Course

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:6833</td>
<td>History and Foundations of Social Studies Education</td>
<td>3</td>
</tr>
</tbody>
</table>

Global Education Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:6840</td>
<td>Theories and Perspectives in Global Education</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:6841</td>
<td>Attaining a Global Perspective</td>
<td>2-3</td>
</tr>
<tr>
<td>EDTL:6842</td>
<td>Examining Power, Resistance, and Change Through Global Education</td>
<td>3</td>
</tr>
</tbody>
</table>

The remaining course work must be distributed among approved cognate areas (see “Required Cognates” under Ph.D. Required Research Courses [p. 1] in this section of the Catalog), history, social sciences or related areas, and professional education, depending on a student’s background and goals.

Seminars and courses numbered 5000 or above are required in each of the study areas that constitute the major.

Comprehensive Examination

Students take three three-hour examinations, one in each of the study areas. Depending on the distribution of course work, the nine hours of written examinations may be rearranged. The Ph.D. examining committee consists of five members, who are selected according to the nature of the student’s Ph.D. program and distribution of course work. An oral examination is conducted by the committee following the written exam.

Dissertation

Candidates, in consultation with their committee, may choose to complete a dissertation organized by either chapters or publishable articles, depending on their career goals and the
nature of their study. In either case, the scholarly pursuit must be on a philosophical or social science research problem in social studies education. The candidate must present a prospectus of the proposed scholarship to the committee before undertaking the dissertation. Upon completion, the candidate defends the dissertation in an oral exam.

**Admission**

Applicants must meet the admission requirements of the Graduate College. They must have a bachelor’s degree in history, the social sciences, or education; a master’s degree in history, the social sciences, or education; a cumulative g.p.a. of at least 3.00; and a combined verbal and quantitative score of at least 310 on the Graduate Record Exam (GRE) General Test. At least two years of teaching experience is strongly preferred. Applicants who did not write a thesis as part of their M.A. must submit seminar papers or field research as equivalents.

**Special Education**

The Doctor of Philosophy in teaching and learning with a special education subprogram requires a minimum of 90 s.h. of graduate credit. The program prepares students for teaching and research positions in higher education, and for curriculum, supervisory, and research positions in state and local education agencies. The program permits students to study and practice extensively in their special education interest area and in an interest area outside of special education.

The Ph.D. curriculum includes an emphasis on research skills, all facets of special education, an approved cognate area (see “Required Cognates” under Ph.D. Required Research Courses [p. 1] in this section of the Catalog), and at least one specialization area.

**Required Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EALL:5150</td>
<td>Introduction to Educational Research</td>
<td>3</td>
</tr>
</tbody>
</table>

**Quantitative Research Requirements (13-15 s.h.)**

Both of these:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSQF:4143</td>
<td>Introduction to Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6243</td>
<td>Intermediate Statistical Methods</td>
<td>4</td>
</tr>
</tbody>
</table>

Two of these:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPLS:6206</td>
<td>Research Process and Design</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6220</td>
<td>Quantitative Educational Research Methodologies</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6244</td>
<td>Correlation and Regression</td>
<td>4</td>
</tr>
<tr>
<td>PSQF:6246</td>
<td>Design of Experiments</td>
<td>4</td>
</tr>
<tr>
<td>PSQF:6247</td>
<td>Nonparametric Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6249</td>
<td>Factor Analysis and Structural Equation Models</td>
<td>3</td>
</tr>
<tr>
<td>PSQF:6252</td>
<td>Introduction to Multivariate Statistical Methods</td>
<td>3</td>
</tr>
</tbody>
</table>

**Qualitative Research Requirements (6 s.h.)**

This course:

EDTL:7953 | Seminar: Single Subject Design Research | 3 |

One of these:

EDTL:7410 | Mixed Methods Research | 3 |
EPLS:7373 | Qualitative Research Design and Methods | 3 |

**Core Course**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7004</td>
<td>Schooling in the United States</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7033</td>
<td>Seminar on Teacher Education</td>
<td>3</td>
</tr>
</tbody>
</table>

**Proseminar Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7943</td>
<td>Proseminar: Issues, Trends, and Research in Special Education</td>
<td>3</td>
</tr>
<tr>
<td>EDTL:7944</td>
<td>Proseminar: Issues, Trends, and Research in Special Education II</td>
<td>3</td>
</tr>
</tbody>
</table>

**Minor**

Students also must complete an interdisciplinary minor in a discipline outside of special education (minimum of 12 s.h.).

**Comprehensive Examination and Dissertation**

In addition, students are required to write the comprehensive examination and complete a doctoral dissertation, earning a minimum of 10 s.h. in the following course.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTL:7493</td>
<td>Ph.D. Thesis</td>
<td>10</td>
</tr>
</tbody>
</table>

**Admission**

Applicants must meet the admission requirements of the Graduate College. They must have a master’s degree or equivalent in special education; those without an M.A. thesis must have completed an equivalent project. Applicants should have a graduate g.p.a. of at least 3.50 and a combined verbal and quantitative score of at least 300 on the Graduate Record Exam (GRE) General Test. Applicants whose first language is not English must score at least 100 (internet-based) on the Test of English as a Foreign Language (TOEFL). Applicants should have at least one year of full-time teaching experience with exceptional children; several years are preferred.

Application materials must include a completed Graduate College application form, copies of official transcripts for all college course work, an official report of Graduate Record Exam (GRE) General Test scores, three current letters of recommendation, and evidence of experience and/or teacher licensure/certification. An interview may be requested.

Final admission decisions are made by the special education graduate admissions committee.