Doctoral Student Handbook
Science Education Program
Department of Mathematics and Science Education
University of Georgia
Effective Spring Semester 2018
Revised for Spring Semester 2018
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This document is intended to provide an overview of the intended purpose, formal requirements, and most important informal but customary expectations of our doctoral programs, in most specifics representing a clear and explicit consensus of the Science Education faculty, and in some the informed but subjective perspective of the Graduate Coordinator based on experience. It also includes a number of highly specific details to help doctoral students and their advisors navigate the bureaucratic aspects of the Science Education doctoral programs.

Overview of Doctoral Programs

Doctoral programs in Science Education are highly individualized, since our doctoral students have a great variety of academic and professional backgrounds and career goals. Students in our doctoral programs are a unique and stimulating mixture of full-time students from across the United States (usually with extensive secondary science teaching and/or scientific research experience), local science teachers (most often studying part-time), and international students from many different countries. In consultation with a Major Professor and the three or four other faculty who form a doctoral committee, students select courses and plan a program of other experiences in light of their specific background and goals. Students regularly share the results of their work at state, regional, national and international conferences focusing on science teaching, science teacher education, and science education research. The program culminates in a doctoral dissertation study that is of unique interest and relevance to each student’s intellectual and professional context and may employ any of a wide variety of research methods.

Common Career Goals of Graduates

Doctoral study in Science Education at UGA is intended to assist educators in gaining highly advanced, theory- and research-based knowledge and skills in the teaching of science, in science teacher education, and in conducting research in science education. Most of our students have one of four general kinds of career goals, in roughly this decreasing order of frequency:

- College or university faculty positions in education, primarily teaching education courses and conducting educational research
- Teaching science in K-12 schools with the highest possible level of expertise and compensation
- Faculty positions in science content fields at non-research-oriented colleges and universities
- Positions with responsibility for supervision, coordination, and/or policymaking in science teaching, teacher education, or educational research programs at the school, district, state, or national levels, or in contexts such as informal science education centers or other organizations

Degree Options

Science Education doctoral degrees include the Doctor of Philosophy (PhD) and Doctor of Education (EdD). The PhD is considered a more purely research-oriented degree, with graduates most often seeking positions in higher education, teaching education courses and sometimes introductory science courses, and usually maintaining an ongoing program of research in science education. In principle, the EdD is considered more practitioner-oriented, with most graduates working in school or district leadership or state-level policy or supervisory positions, teaching science at non-research-oriented colleges, or continuing as classroom science teachers at the secondary (or occasionally elementary) level.

In our program, formal coursework and other degree requirements and guidelines for the two degrees in Science Education differ only in slight detail. A major consideration, however, is that the UGA Graduate School's Residency Requirement is considerably more stringent for the PhD, requiring at least one full-time year of study, and therefore students who wish to complete an entire doctoral degree on a part-time basis, while maintaining a full-time teaching job, are often limited to the EdD.
Relationship to Teacher Certification Status

Our doctoral programs have no necessary relationship to teacher certification status in Georgia or other U.S. states, nor is teacher certification in any state or country required for admission or graduation. However, teachers already holding Georgia T-4 (initial, undergraduate-level) or T-5 (master’s-level) teacher certification in a secondary science field (Biology, Chemistry, Physics, Earth/Space Science, or “Broad Field” Secondary Science, Grades 6-12) earn an upgrade to T-6 certification – the same as for completing a Specialist in Education (EdS) degree – by passing the Written and Oral Comprehensive Examination in a doctoral program, and earn an upgrade to T-7 certification upon completion of all doctoral degree requirements. Such certification upgrades will also be honored by most other U.S. states, and may also apply to those holding certification at the Middle Grades (4-8) level with a specialization in Science or in Early Childhood (K-6) with a Science endorsement.

Time Commitment

PhD study in Science Education is ideally pursued on a full-time basis. Nearly all doctoral students who are full-time for multiple years apply for financial support in the form of a Graduate Assistantship position, which includes both a cash stipend and a tuition waiver, and assistantship duties nearly always require working on the UGA campus and/or in local schools, during daytime hours, during the academic year. Only full-time students may hold Graduate Assistantship positions, and full-time status is operationally defined as enrollment for at least 12 semester hours of credit in an academic year semester (Fall or Spring) or 9 semester hours of credit in Summer Semester.

Completing either doctoral program through part-time study while maintaining a full-time K-12 or college teaching position or other career is possible, although logistically more difficult. All doctoral-level courses in Science Education meet during evening hours during the academic year, and most courses in other departments commonly taken by doctoral students in our program are offered in the evening or during the Summer Semester or, increasingly frequently, online. Part-time doctoral students should pay special attention to the UGA Graduate School’s Continuous Enrollment Policy, which requires all graduate degree students to register (for at least 3 semester hours of credit) for at least 2 of the 3 semesters of each year (defined as Fall-Spring-Summer) until graduation.

The Graduate School presumes that doctoral study will extend at least 3 full-time-equivalent years. Full-time doctoral students in Science Education most often complete the program in 3 to 4 years, with part-time or largely part-time students nearly always taking very significantly longer (most typically 5-7 years, and varying much more widely). The same Graduate School time limits apply to PhD and EdD and to full- and part-time students, and are:

- a maximum of 6 years from enrollment in the first courses included in the official Program of Study until admission to candidacy (“all but dissertation” status)
- a maximum of 5 years from admission to candidacy to successful defense of the dissertation and graduation.

Students, if supported by their Major Professor and the Graduate Coordinator, may petition the Graduate School for extension of either of these limits in the event of extraordinary personal hardship.

Tuition, Fees, and Financial Support

All UGA students, including those whose tuition is waived (see below), are responsible for paying miscellaneous fees. At the time of this writing those fees total $1133 per semester enrolled ($908 for part-time students enrolled for 5 or fewer hours) at the Athens campus.

Part-time students must pay tuition, on a per-credit-hour basis. As at most state universities in the United States, tuition rates for UGA students whose primary residence is in the state of Georgia are much lower than for out-of-state (or international) students (at the time of this writing, at the graduate level, $363 vs. $1029 per credit hour). For completely up-to-date information about current levels of both tuition and fees, please consult http://busfin.uga.edu/bursar/bursar_quick_links/.
A limited number of students may be nominated each year by the Graduate Coordinator for a Regents Out-of-State Tuition Waiver (ROOSTW) award, which allows non-residents to pay the lower, in-state rate. These awards are made on a one-year, potentially renewable basis and the call for nominations for awards for the following academic year is usually issued in late February to early March.

Nearly all full-time PhD students in Science Education at UGA hold a Graduate Assistantship appointment, typically requiring either 13, 16, or 20 hours of work per week (commonly known as 1/3-time, 40%-time and 1/2-time, respectively). This may be a teaching assistantship (working with a faculty instructor in a course, occasionally teaching a course as Instructor of Record, or field supervision of student teachers or practicum students) or a research assistantship (participating in data collection, data analysis and/or writing/presentation of results). Graduate Assistantships carry two important benefits: a waiver of all but a token $25 of tuition charges (fees must still be paid; see above), and a cash stipend whose amount varies according to both the proportion of time worked and the source of funding. Graduate Assistantship appointments are not available to part-time students.

Assistantship appointments typically begin in the Fall Semester and extend over the academic year (Fall and Spring Semesters). Although most assistantships do not require work or offer a stipend during Summer Semester, students holding an assistantship appointment in the preceding Spring and/or following Fall Semester qualify for the tuition waiver for Summer Semester as well.

While formal assistantship contracts are normally for one academic year, there is a strong tradition among our program faculty and administration of placing the highest priority on continuing to support full-time doctoral students in good academic standing for up to four years whenever possible. Students who have not yet graduated after four full-time years are rarely offered department-funded assistantships for a fifth year or more. Grant-funded assistantships may be extended for such students at the complete discretion of the grantee. All assistantships are subject to the availability of state and grant funds.

Special assistantships for new students (UGA doctoral students may not be nominated) funded directly by the UGA Graduate School or College of Education on a highly competitive basis are widely considered the most desirable, primarily because the stipend amount is higher and the commitment to multiple years of support is explicit and firm. Prospective students must be fully admitted to the program and to the Graduate School to be eligible for nomination for these awards by the department’s Graduate Coordinator before the established deadlines, which typically fall as early as January. Therefore early application (before November 1st is now highly recommended, for starting the program in the following Summer or Fall Semester) and admission is very important to maximize the possibility of being eligible for nomination for these awards. These awards include Presidential Graduate Fellowships, for which the nomination deadline is typically in late January, and the Graduate School Assistantships (GSA) and College of Education Research Scholar Awards (CRSA), for which the nomination deadline is typically in February. Please see http://grad.uga.edu/index.php/current-students/financial-information/graduate-school-based-financial-assistance/funding-from-graduate-school/ for details and exact current deadlines.

Other common sources of funding for assistantships are projects funded by grants to members of the faculty (usually for research, but sometimes in connection with special inservice teacher education courses or workshops), and assistantships funded at the department level, with funding from the College of Education (nearly always associated with teaching undergraduate courses). Upon admission, prospective students will be kept informed by the Graduate Coordinator of the possibility/probability of assistantship funding. For grant-funded assistantships, faculty may recruit and consider any existing or prospective students at any time, and the timing of any offer of an assistantship position is entirely in the hands of the grantee. For department-funded assistantships, formal offer letters are usually issued by the Department Head late in April or May for the following academic year.

Another special Graduate School assistantship, the Dissertation Completion Award, is available on a competitive-application basis for students who can convincingly demonstrate that they are
approximately one year from completion of their dissertation study and would greatly benefit from continued funding while being relieved of substantive assistantship duties during that period of time. The nomination deadline for this award is typically in early March.

The College of Education offers many competitive-application scholarships, in relatively small amounts in comparison to assistantship stipends, for which both full-time and part-time students may apply, although for many of them explicit preference is given to full-time students and many also have particular demographic or field of interest requirements. Please see https://coe.uga.edu/experience/financial-aid/phd/science-education for details.

Doctoral Advising

A First-year Advisor is appointed for each matriculating student by the Graduate Coordinator from among the faculty, and consults with the student about initial coursework choices. Any preference expressed by new students for assignment of a First-year Advisor is one (but only one) consideration in making these assignments. Students will identify a Major Professor (who may or may not be the same as the First-year Advisor) from among the Science Education faculty, by mutual agreement, usually approximately at the end of the first year or beginning of the second year in the program, after becoming more familiar with the range of expertise, interests, and working styles of the various faculty. The establishment of this relationship should be reported to the Graduate Coordinator, who will in turn report it to the Graduate School. Formal appointment of Co-major Professors is allowed, but is usually discouraged because it is bureaucratically awkward in several different ways, among them that Graduate School rules consider each Co-major Professor to count as only “half a person, with half a vote” on the committee.

A full faculty committee should ideally be identified soon afterward, and the membership of the committee must be reported to the Graduate School using the appropriate form available on their web site (http://grad.uga.edu/wp-content/uploads/2014/11/body_advcomphd.pdf). Rules established by the Science Education faculty for doctoral committee membership are:

- At least three members must hold full UGA Graduate Faculty status. [Graduate School rule]
- The Major Professor must be a regular (vs. adjunct) member of the Science Education faculty.
- The committee must include at least 4 members.
- The committee must include at least one other member of the regular (vs. adjunct) Science Education faculty.
- The committee must include at least one at least one “outside” (of Science Education) member.
- UGA faculty in other departments who hold Adjunct Faculty status in Science Education may be counted as either “inside” or “outside,” but may not serve as Major Professor.
- “Outside” member(s) are most often drawn from the faculty in another field within the College of Education (often a specialist in a particular research methodology), but quite often may be a scientist in the student’s major content field or field of research focus, with an appointment in another UGA College or School (e.g., Arts and Sciences, Ecology, Agriculture, Forestry).
- A faculty member from another university, whose special expertise is identified by the student and Major Professor as uniquely valuable to the student's planned dissertation study, may also be included as a member. Such appointments must be specially approved by the Graduate School, requiring documentation of the qualifications of the proposed member (e.g., her/his vita) and usually a rationale statement from the Major Professor explaining that the required special expertise is not readily available among UGA faculty. Not more than one such member is allowed. It is understood that such committee members, and occasionally others, may well have to “attend” committee meetings via electronic communication.
technology (e.g., telephone, Skype, Zoom, Google Hangouts), but currently arrangements must still be made for them to personally sign all official Graduate School forms (see below) related to the student’s progress.

- In the event that Co-major Professors are appointed, those two people count as only a one faculty member for purposes of the three-person Graduate Faculty minimum (first rule above), and for purposes of all Graduate School forms, but as two people for the other quantitative committee composition rules specified above. At least one, but not necessarily both, of the Co-major Professors must be a regular member of the Science Education faculty.

The members of the doctoral committee are expected to become a group of mentors and resources for the student at all stages of the program, helping the student in determining coursework requirements, planning relevant experiences aside from coursework, planning and carrying out a dissertation research study, and making future career decisions. One or more members of the committee very commonly advise the student about becoming involved in various professional organizations relevant to science education, nearly always including making co-presentations on the subject of their research and/or teaching efforts at the annual meetings of those organizations, and ideally also leading to publication in professional journals (see below).

Program Requirements and Planning

A broadly based core of knowledge and proficiencies is gained through the Science Education program’s graduate courses, as well as courses in other departments and programs in the College of Education – e.g., Educational Research (ERSH), Qualitative Research Methods (QUAL), Educational Psychology (EPSY), Social Foundations of Education (EFND), or sometimes others – and the various science departments (e.g., the Biological Sciences Division or the Departments of Physics and Astronomy, Chemistry, Geology, etc.). A more specific background in the candidate’s particular areas of interest is primarily gained through formal internships (in both research and university teaching; courses ESCI 9600 and 9700), other supervised, special-focus projects (courses ESCI 6000 and/or 9000), occasional special-focus courses (e.g., special sections of the ESCI 8990 seminars), and, often, paid assistantship duties. These may be supervised or guided by any of the faculty, and may be initiated based on the unique interests and/or initiative of the student or carried out in conjunction with existing research or instructional activities of program faculty.

A typical program for the doctorate in Science Education will require the equivalent of 2 to 3 years of full-time coursework beyond that typically included in a master's and/or specialist degree. Dissertation research normally takes another full-time-equivalent year or more.

Part-time students, typically with a full-time “day job” as a science teacher at either the K-12 or college level, normally spread coursework out over a considerably longer period, varying widely according to how intensively they are willing and able to study, although some particularly ambitious and industrious teachers have completed coursework, or even the entire degree program, at a rate more typical of full-time students. As one practical example, a part-time student willing/able to travel to Athens for evening course meetings only one day per week, or for only one month per summer, is likely to take two to three times as long, or more, to reach candidacy status as a student (whether full- or part-time) who takes multiple full (3-credit-hour) courses during a semester.

The doctoral committee is responsible for approving a coursework plan for the student, and this is ideally formalized in an Initial Program of Study document very soon after the committee is formed. The Graduate School provides a form for this purpose (http://grad.uga.edu/wp-content/uploads/2014/11/body_prephdprg.pdf), but the signed document is not forwarded to the Graduate School office but rather maintained in the program’s internal records. See the section on Course Requirements and Recommendations below for details, but in general, for this form and also for the eventual Final Program of Study form:
Courses should be listed in the chronological order in which they were taken or are expected to be taken (not grouped by substantive categories as in the detailed explanatory section below). If the number of courses to be listed in any section exceeds the fields available on a single page, a second page (using the same template form) should be added, and duplicate signatures are required on that page.

The uppermost section is for listing any courses taken by the student as part of previous graduate degrees (whether at UGA or at other institutions) that the committee wishes explicitly to recognize as having been taken into account in determining the numbers or types of courses that the student should be required to take as part of UGA doctoral studies. Especially important to list here would be any courses that are considered so closely equivalent to those that would normally be required that they will be counted as substitutes for some of the UGA courses customary taken by most ESCI doctoral students. Courses listed here are not technically subject to the 6-year time limitation imposed by the Graduate School, but in some cases faculty on the committee may have substantive reason to judge that some courses taken long ago may be considered obsolete and therefore irrelevant.

The lower, main section is for listing all graduate-level courses taken or to be taken while a doctoral student at UGA. Grades and semesters should be listed for courses already taken, while grades or possibly semesters are necessarily left blank for some of the courses (probably most, in the case of the preliminary document). Courses with grades below C may not be included on the Program of Study. Any courses taken during enrollment at UGA for which credit is to be formally transferred from another institution (although this is almost never necessary or even desirable in practice, for several reasons) should also be listed here. Formally transferred courses (this is not the same thing as possible course substitutions described above) may not have been part of the requirements for earlier degrees, and grades below B may not be transferred. Graduate School rules general to all graduate degree programs limit formal transfer of credit to a maximum of 9 hours, and also allow a maximum of 9 hours of UGA coursework initially taken on a non-degree basis, before admission to a degree program, to be included on the Program of Study.

Absolutely required course credits for which no substitutions may normally be made, and which must be included on an acceptable document (for numbers of hours, see below), include ESCI 8990, 9300, 9600, and 9700. Substitution for other ESCI 8000- or 9000-level courses should be granted only when evidence for the equivalence of the prior course is considered by the committee to be clear. Courses in other categories for which such substitution is quite common include the required Measurement/Assessment/Evaluation course, the first ERSH course (basic statistics), and science content courses (especially, and perhaps obviously, if the student holds a previous master’s degree in a science content field rather than in an education field).

The absolute minimum number of total course hours that the Graduate School requires be included on a doctoral Program of Study is 30, at least 16 of which must be open only to graduate students. Both of these rules virtually never come into practice with Science Education students.

Course Requirements and Recommendations

Although each student’s dissertation research eventually becomes the centerpiece of their doctoral experience, an integral component of our PhD and EdD programs is coursework. Doctoral program requirements include courses in the five areas (Science Content, Science Education, Research Methodology, Educational Psychology, and Social Foundations of Education) described below. Further requirements that carry course credit but that do not meet as conventional courses include the Research Internship(s), Teaching Internship, and Dissertation Research.
Science Content Courses:
Evidence of in-depth knowledge of the core science teaching field (Biology, Chemistry, Physics, Earth/Space Sciences) most relevant to the student's interest is expected. Normally all coursework in this area will be taken at the graduate level, although undergraduate courses may sometimes be deemed appropriate by a student’s committee (although any such courses should not be included on the formal Program of Study). While it is normally expected that these courses will build advanced-level knowledge and skills within one science field, students are also encouraged to include more basic coursework to increase their familiarity with science fields in which their background is relatively weak. The ideal is to complete coursework equivalent to that included in a typical master's degree program (minus a research thesis) in a single science field. As a practical matter, the faculty are aware that it is extremely difficult at UGA for part-time students to schedule substantively graduate-level coursework in many science fields, due to the dearth of such courses offered in Summer Semester or in evening time slots or online during the academic year, and Major Professors and committees are urged to take this unfortunately practical constraint into consideration.

Science Education (minimum 22 hrs.):
Courses leading to a broad theoretical understanding of issues in science education are a major component of the doctoral program. All full (3-hour) courses offered by our faculty and intended primarily for doctoral students (8000-9000-level) are offered once every two years, on a regular rotating schedule (see below for details), almost exclusively during the academic year (Fall and Spring Semesters). Master’s-level (6000-7000-level) courses in Science Education may also be judged to be required or strongly recommended for some students, and are almost exclusively offered in Summer Semester, with most also on a two-year rotation. Courses in other pedagogical disciplines (e.g., Mathematics Education, Language and Literacy Education, Social Studies Education, Middle Grades Education, Early Childhood Education, Instructional Technology) may be appropriate for some students.

Evidence of the capability of teaching science at the elementary, secondary, or higher education levels, in keeping with the student's professional goals, is required, and those with little or no science classroom teaching experience may be required to gain such practical experience at some point during their doctoral studies. In some cases this may be stipulated by a majority of the faculty as a condition of admission and therefore of eventual graduation, although enforcement of any such conditional admission is delegated to the Major Professor and the rest of the doctoral committee.

Each doctoral student must complete at least 22 semester hours of Science Education (ESCI) coursework at UGA, including:
- at least 4 hours of ESCI 8990, Research Seminar in Science Education, normally as separate 1-hour enrollments (Note: It is strongly suggested that these enrollments be during the first four academic-year semesters of the student’s program. This is because, beyond the importance of the substantive topics covered in these seminars, another purpose is to bring together all first- and second-year doctoral students, full-time and part-time, as a loose cohort.)
- at least 6 (18 hours total) of the 8000-9000-level ESCI courses listed below
  - ESCI 8200 Science Supervision, Mentoring, and Induction
  - ESCI 8210 Multicultural Science Education Research
  - ESCI 9020 History and Theory of Science Education
  - ESCI 9080 Science Curriculum Theory and Practice
  - ESCI/EMAT 9600 [temporary number] Learning and Knowing in Mathematics and Science
  - ESCI 9630 Critique of Educational Literature in Science Education
  - ESCI 9730 Science Teacher Education Theory and Practice
  - ESCI 9740 Science Studies and Science Education
Graduate-only courses in Science Education intended primarily for master’s and specialist degree students, but which may be judged appropriate for some doctoral students (especially those with no previous degrees in education) include:

ESCI 6200. Science, Technology, and Society [repeatable for credit; specific focus alternates]
ESCI 6220-6230. Marine Environmental Education and Environmental Science Education [the Georgia Shore Program, two-week residential program on Skidaway Island]
ESCI 6420. Science for PreK-8th Grade
ESCI 7040. Teaching Strategies for Middle and Secondary School Science Teachers
ESCI 7080. Curriculum Planning in Science Education

The current plan for the scheduling of these course offerings in the foreseeable future is listed below.

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<th>Fall (odd-numbered years)</th>
<th>Spring (even-numbered years)</th>
<th>Summer (even-numbered years)</th>
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<tr>
<td>9740 Science Studies</td>
<td>9730 Science Teacher Education</td>
<td>6220-6230 Georgia Shore Program</td>
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<tr>
<td>8210 Multicultural Education</td>
<td>9630 Critical Review of Lit</td>
<td>7040 Teaching Strategies</td>
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<td>6200 [Socioscientific Issues]</td>
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<td>6420 PreK-8</td>
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<td>Fall (even-numbered years)</td>
<td>Spring (odd-numbered years)</td>
<td>Summer (odd-numbered years)</td>
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<tr>
<td>9600 Learning and Knowing</td>
<td>9020 History and Theory</td>
<td>6220-6230 Georgia Shore Program</td>
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<td>8100 Supervision</td>
<td>9080 Curriculum</td>
<td>7080 Curriculum</td>
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<td>6200 [STEM Integration]</td>
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<td>6420 PreK-8</td>
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Research and Evaluation (minimum 15 hrs.):

Evidence of competence in educational research skills is a critical component of the doctoral program. Courses in educational research design, qualitative and quantitative research methodology, educational measurement/assessment, and program evaluation may be taken to meet this requirement. The required subcategories and the courses that are generally used to satisfy this requirement are listed below.

Measurement/Assessment/Evaluation:
All students must take a minimum of one course from among:

- ERS 6600. Applied Educational Assessment
- ERS 7250. Education Program and Project Evaluation
- ERS 7600. Construction of Educational Measurement Instruments
- ERS/EADU 7610 Questionnaire-based Research in Education

Research methodology:
All students must take at least a three-course sequence (or its equivalent) in one major research methodological area (quantitative, qualitative) and develop expertise in the design of research in that methodology. At least one course in the other major methodological area is also required. The two introductory sequences of courses are:

- ERS 6300. Applied Statistical Methods in Education (or STAT 6210 or 6310)
- ERS 8310. Applied Analysis of Variance Methods in Education (or STAT 6220 or 6320)
- ERS 8320. Applied Correlation and Regression Methods in Education (or STAT 6420)
- QUAL 8400. Qualitative Research Traditions
QUAL 8410. Designing Qualitative Research
QUAL 8420. Analyzing Qualitative Data

For instance, students may choose to take either three ERSH courses and one QUAL, or three QUAL and one ERSH. Depending on details of the specific methodology considered most likely to be used in the dissertation study, most students will take one or more additional, more advanced courses, beyond the required three, in their primary area. Many students in our program earn the Certificate in Interdisciplinary Qualitative Studies, which requires five courses. Details may be found at https://coe.uga.edu/academics/non-degree/certificates/qualitative-research.

Doctoral students who have had no previous exposure to educational research and its methods in a previous graduate degree program may be advised to take ESCI 6990, Introduction to Research in Science Education, or ERSH 6200, Methods of Research in Education, before beginning either of the above sequences.

Educational Psychology (minimum 6 hrs.):
Doctoral students should develop knowledge of relevant research on the psychological foundations of education. At least two courses from the many and varied offerings at the graduate level in Educational Psychology (EPSY) are required.

Social Foundations of Education (minimum 6 hrs.):
Doctoral students should develop knowledge of the history, philosophy, sociology, and/or anthropology of education, and of research on sociocultural aspects of education. At least two courses at the graduate level in the Social Foundations of Education (EFND), or ESCI courses whose focus intersects substantially with social foundations issues (e.g., ESCI 8210, 8310, 9020, 9740), are required.

Besides the graduate courses offered in this area within the College of Education, selected courses in History, Philosophy, Sociology, Anthropology, Psychology, Women’s Studies, African American Studies, and potentially other areas may be highly relevant to the interests of some students and may be approved by their committees for inclusion on the Program of Study in this category.

Research Internship (minimum 3 or 6 hrs.):
All PhD students must enroll for 6 hours (normally two three-hour enrollments) of ESCI 9600, Research in Science Education. EdD students must take 3 semester hours (normally a single enrollment). These research internships are most often under the supervision of the student’s First-year Advisor or Major Professor but may also be completed under the supervision of other faculty, in addition or instead. Topics may arise primarily from the student’s own specific interests or may grow out of the ongoing research program of the supervising member of the faculty. Frequently the product of these enrollments will be a conference presentation proposal or manuscript that may be submitted for publication, and is quite often used to satisfy the Publishable Paper requirement for admission to candidacy (see below).

Important note: The ESCI 9600 experience is expected to be separate from, or in addition to, any duties specifically assigned as part of paid Research Assistantship hours. To do otherwise is considered inappropriate “double dipping.”

Teaching Internship (minimum 3 hrs.):
All doctoral students must enroll for at least 3 hours of ESCI 9700, Internship in Science Education. The purpose of this requirement is to ensure that all doctoral students gain some experience in teaching undergraduate/master’s level courses, under the guidance and supervision of a faculty member.

For full-time students this is usually in the context of one of the ESCI courses required for one of the initial teacher certification programs in the College of Education: Early Childhood (ESCI 4420/6420),
Middle School (ESCI 4410/6410, 4430, 4440) or Secondary Science (ESCI 3450, 4450/6450, 4460/6460, 4480/6480, 5460/7460, 5470/7470).

For part-time students this is often in the context of one of the master’s-level courses taught in the Summer Semester (ESCI 7040, 7080, 6200, 6420, or other, special-purpose courses offered more irregularly).

For students whose career goal is college-level science teaching, it may be in a science content course (e.g., BIOL, CHEM, PHYS) under the supervision of a scientist who is an adjunct member of the Science Education faculty.

Often, faculty who regularly serve as instructors for one of the preservice “Methods” courses listed above will regularly structure a 9700 experience as the initial stage of an “apprenticeship” sequence that may subsequently lead to assignment as a formal TA for the course and, sometimes, when it mutually suits the needs and priorities of both the student and the program, as Instructor of Record for undergraduate students in the course.

Note: The ESCI 9700 experience is expected to be separate from, or in addition to, any duties specifically assigned as part of paid Teaching Assistantship hours. To do otherwise is considered inappropriate “double dipping.”

ESCI 9005 Registration:
All doctoral students holding Graduate Assistantship appointments are expected to register for 3 hours of ESCI 9005, formally titled Doctoral Graduate Student Seminar, in each semester that they have assistantship duties and are receiving assistantship benefits (tuition waiver and stipend). This is not a “real course” with any meetings or requirements, but rather a “bookkeeping fiction” instituted by the Graduate School on behalf of each department/program to give formal credit to both students and supervising faculty for their work on assistantship-related projects. This is very important, however, in that registration for these hours results in a small but significant amount of increased funding flowing from the university level to the College of Education and the Department of Mathematics and Science Education. That money is ultimately one source of funding for the grants that students may get from the college and the department to partially offset the expenses of travel to make presentations at conferences (see below). A grade of “S” (Satisfactory) will be formally entered by the Graduate Coordinator for this enrollment at the end of each semester, except in the extremely rare event that a faculty supervisor reports that a student was grossly negligent in the performance of her/his assigned assistantship duties.

Doctoral Dissertation:
Every doctoral candidate must enroll for a minimum of 3 semester hours of ESCI 9300, Doctoral Dissertation. Because the Graduate School requires a minimum of 10 total hours of enrollment after achieving candidacy, in practice nearly all doctoral students enroll for a total of at least 10 hours, and usually quite a bit more, of this credit. For this reason, normally the Program of Study will list 10 hours of ESCI 9300, with the semester left open.

Note that enrollment in ESCI 9300 should not normally occur before advancement to candidacy has been achieved (see below for details). Credit for supervised research work related to a planned dissertation that is undertaken before candidacy should be in the context either of ESCI 9600 (see above) or an ESCI 9000 (Doctoral Research) enrollment, rather than 9300. Common examples are preparing all or part of the dissertation prospectus, or planning or completing a “pilot study” using the tentatively planned procedures for dissertation data gathering and analysis on a smaller scale or in a different context. These two processes may well be simultaneous and/or interrelated.

Conference Presentations and Publishing
Doctoral students in Science Education regularly share the results of their work, in the form of paper presentations, poster or roundtable sessions, symposia, or workshops, at state, regional, national and
international conferences, often initially as co-authors/presenters with faculty members or more experienced doctoral students, and usually as sole or first author/presenter by the time of their graduation. The national/international professional organizations specific to science education whose conferences are the most frequent venues for such presentations include the National Association for Research in Science Teaching (NARST; typically held in March-April), Association for Science Teacher Education (ASTE; January), National Science Teachers Association (NSTA; regionals in fall, national in spring), and the divisions and special interest groups most relevant to science education of the American Educational Research Association (AERA; March-April). NARST is frequently scheduled at or near the same location and time as either AERA or NSTA (usually in alternating years, even-odd), so it is often time- and cost-efficient to attend two of those conferences back-to-back. Proposal deadlines for these conferences are usually 6 or more months in advance of the conference (for instance, typically August 15th for NARST), so foresight and planning are of great importance.

Students who are sole or first authors of accepted presentations may apply for financial support for travel to such conferences from a variety of sources at the University, College, and (just recently) Department level, typically with four deadlines spread across each year corresponding to travel in each of four different three-month periods (e.g., to cite the most commonly applicable example, with an application deadline of early December for travel in March, April, or May). The amount of money awarded typically will not fully cover all expenses, but is expected to be of significant help in making travel to present at conferences more affordable. The Graduate Coordinator will notify students of these opportunities when the call for applications is announced.

Especially for those students whose career goal is a university faculty position in science education or a closely related field, conference presentation experience is a routinely expected qualification for entry-level positions, and an increasingly important additional qualification for the most competitive positions is publishing in major peer-reviewed journals in the field, at least as a co-author. Most often, manuscripts submitted for publication grow out of projects that first result in national or international conference presentations, which in turn often overlap significantly with assigned assistantship duties, ESCI 9600 projects, or dissertation-related research.

Acceptance, based on peer review, of a sole- or first-authored conference presentation proposal or manuscript for publication is one of the requirements, along with passing the Comprehensive Examinations and preparing a dissertation prospectus acceptable to the committee, for admission to candidacy (see details below).

**Doctoral Comprehensive Examination (Written and Oral)**

At or near the end of each student's planned coursework, a committee meeting is held at which a Final Program of Study ([http://grad.uga.edu/wp-content/uploads/2014/11/finalphdprg.pdf](http://grad.uga.edu/wp-content/uploads/2014/11/finalphdprg.pdf)) is normally approved (see Program Requirements and Planning above for a detailed description of the protocol for preparing this document). Normally at this meeting a preliminary discussion of the student’s envisioned dissertation research topic is also held, and the nature and scheduling of the Doctoral Comprehensive Examination (also sometimes referred to as a Preliminary Examination or “Prelim”) will be determined, with the general range of topic areas covered by a set of exam questions agreed upon by the committee, often but not always in direct consultation with the student.

It is not necessary that all coursework (other than dissertation hours) be completed before this process begins – the Final Program of Study often includes a small number of courses that the student and committee agree will be taken in the near future, with the most common category of these being specialized or advanced research methodology (usually ERSH or QUAL) courses, many of which have multiple specific prerequisites and are not offered every semester. The planned semester for these courses may be indicated on the form, or that field may be left open.

Although the number and format of Written Comprehensive Examination questions can vary according to the preferences of the Major Professor and/or other members of the committee, normally
each of the committee members prepares a question to which the student will write a response. While faculty have wide latitude in fashioning questions, they commonly fall into one or more of several categories, including but not limited to: broad knowledge of the canonical concepts and literature of some major aspect of the field of science education (e.g., curriculum, teaching and learning, assessment, teacher education, history, philosophy); understanding and/or application of a specific research methodology; critical analysis of one or more selected research reports in a field of special interest to the student; literature review of one or more issues or theoretical perspectives expected to be essential to the student’s dissertation prospectus. Time limits, if any, for student’s work on each question are typically at the discretion of the member of the committee who primarily prepared the question. Customarily, questions are collected from the other committee members by the Major Professor, who formally assigns them to the student, one at a time. One or more committee members may require that the student make revisions to the answer to a particular question before accepting it as satisfactory.

If and when all members of the committee report to the Major Professor that the written responses are satisfactory, it is customary in the Science Education program for copies of all questions and responses to be distributed to all members of the committee before an Oral Comprehensive Examination meeting is scheduled. According to Graduate School rules, this meeting must be scheduled a minimum of 14 days in advance, and the meeting is technically open to all faculty in the university. The Appointment of Advisory Committee (see above under Doctoral Advising) and Final Program of Study forms must have been received by the Graduate School (ideally previously, but simultaneously is acceptable) for this meeting to be scheduled.

The current bureaucratic status of the process of scheduling the “Oral Comp” meeting is a curious mixture of high and low technology: The scheduling must be done online, via the Graduate School web site, by the Graduate Coordinator or his/her assistant, and the paper Approval forms are then generated and printed, in color-coded duplicate, by the Graduate School office and forwarded via campus mail to the Major Professor, typically only slightly earlier than the scheduled meeting, as an attempt to enforce the rules about scheduling. At our state university, these meetings are open to any member of the university community, and their scheduling is listed on the Graduate School’s publicly available web site (https://gradstatus.uga.edu/Announcements/G118).

At this meeting, after an initial “executive session” discussion of the written responses among the committee members only, the student is asked to respond orally to any follow-up questions, requests for clarification, or invitations to informed speculation that any member of the committee may have. At the end of this process, the student is asked to leave the room again, and each member of the committee then formally votes as to whether or not the student passed both the written and oral aspects of the exam, and those results are reported to the student and to the Graduate School. A student may pass the exam with a maximum of one dissenting (failure) vote from a member of the committee, although in such a rare circumstance significant doubt will have been raised about the suitability of the student to continue in the program, at least with that dissenting member of the faculty remaining on the committee.

**Doctoral Dissertation Prospectus**

The doctoral dissertation is an original research study, identifiable within the field of science education, which may focus on a topic/question initially identified by the student, based on his/her special interests and initiative, or may grow out of the established research program or teaching efforts of one or more of the faculty. The decision on a dissertation topic is of crucial importance and normally is arrived at through extended consultation between the student, the Major Professor, and the other members of the committee.

With the guidance of the committee, the student prepares a prospectus for the dissertation study, which customarily includes sections addressing the general rationale and specific purpose of the planned research, a review of relevant literature, and a description of planned data gathering and analysis procedures. The length and level of detail required for each of these aspects of the dissertation
prospectus is left to the discretion of the Major Professor and committee, and varies widely in practice, often partly due to the nature of the study and/or the theoretical background underlying its methodology. Some committees may require much greater length and detail, essentially requiring a plausible first draft of what (in the most traditional format of a complete dissertation) would commonly be referred to as Chapters 1 through 3 (Introduction, Literature Review, Method/Procedures). Others may find a much more succinct document appropriate and acceptable.

The approval of a prospectus occurs at a committee meeting, usually held at a later time than the Oral Comprehensive Examination, although development and approval of a prospectus may precede or (rarely) may be combined with the Oral Comp. Although the scheduling of the “prospectus defense” meeting and the approval form are internal to the department, the Graduate School does (this was not true until 2017) have explicit rules for such meetings, including that the Major Professor (only) must have approved the prospectus before the meeting is scheduled, all members of the committee must be present, and approval requires no more than 1 dissenting vote. It is also customary that the document is distributed to the other committee members a minimum of 14 days in advance.

**Publishable Paper Requirement**

Doctoral students in Science Education are required to complete a publishable paper. The intended purpose of this additional requirement for achieving candidacy in our doctoral programs (both PhD and EdD) is for the student to gain experience both in producing new knowledge in the field of Science Education and in disseminating it through a process in which external reviewers provide evaluative feedback. Here are the details:

- There are three ways in which to fulfill this requirement:
  - Have a proposal accepted for presentation at a major conference and prepare and present the associated paper.
  - Have a manuscript accepted for publication as a journal article.
  - Have a manuscript accepted for publication as a chapter in an edited book.
- The paper must be sole- or first-authored by the student.
- The topic of the paper should be recognizably within the field of science education, although the conference, journal, or book need not be specific to science education.
- For PhD students the paper must be an educational research study (appropriate for an intended audience of science education researchers), although it may be either an empirical study or a theoretical/conceptual one. For EdD students it may alternatively be a practitioner-oriented exposition (appropriate for an intended audience of science teachers).
- Conferences, journals, or publishers should be national or international in scope, rather than local, state, or regional.
- The forum in which it is published/presented must be meaningfully peer-reviewed. No list of examples or counterexamples of acceptable conferences or journals is specified here, because no such list can be exhaustive, and judgment of the appropriateness of the forum in which the work is to be shared is in the hands the student’s committee.
- Some edited books (varying according to publisher and/or the identity or policies of the editor/s) qualify as *bona fide* peer-reviewed publications, while others do not. Again, such judgments should be made by the committee as necessary.

**Admission to Candidacy**

A doctoral student must be admitted to candidacy at least one full semester before graduation. The Application for Admission to Candidacy form must be filed with the Graduate School, and may be found at [http://grad.uga.edu/wp-content/uploads/2014/11/body_candphd.pdf](http://grad.uga.edu/wp-content/uploads/2014/11/body_candphd.pdf). In order to earn admission to candidacy (“all but dissertation” status) for a doctoral degree in Science Education, the following requirements must be satisfied:
• Gain approval of a final Program of Study, which must be signed by all committee members, the Graduate Coordinator and the Dean of the Graduate School.
• Meet the Research Skills Requirement. In Science Education this is formally achieved by listing in the Program of Study the final required course in the chosen initial primary research methodology sequence (e.g., most often, ERSH 8320 or QUAL 8420).
• Maintain an overall 3.0 Grade Point Average for all graduate courses.
• Pass the doctoral Written and Oral Comprehensive Examinations.
• Gain committee approval of the Doctoral Dissertation Prospectus.
• Complete a Publishable Paper.
• The Prospectus and Publishable Paper should be listed on the Final Program of Study form in the field labeled Departmental Requirements.
• Satisfy the Graduate School’s Residency Requirement, as described below:
  o PhD Residency: At least two consecutive, academic year semesters (Fall or Spring) of full-time work, forming part of a minimum of 30 semester hours of consecutive coursework included on the Program of Study, must be spent in resident study on the UGA campus. Full-time status is operationally defined as enrollment for 12 hours or more if holding a Graduate Assistantship appointment, or 9 hours or more if not.
  o EdD Residency: At least two consecutive semesters of work, forming part of a minimum of 20 semester hours of consecutive course work included on the Program of Study, must be spent in resident study on the UGA campus. One semester may be during the Summer.
• In general, meet all requirements for PhD or EdD candidacy as specified in the University of Georgia Graduate School Bulletin (http://grad.uga.edu/index.php/current-students/policies-procedures/graduate-bulletin/graduate-bulletin-a-c/), which is the definitive word on this issue and from which much of the list above has been copied or paraphrased.

**Dissertation, Oral Defense, and Final Approval**

Once admitted to candidacy, students will concentrate their efforts on completing a dissertation research study, although as noted earlier there may be a few courses other then ESCI 9300 that may still need to be completed. Normally work on the dissertation takes at least two semesters for full-time students and frequently more for part-time students.

**Human Subjects and IRB Approval**

A majority of dissertation research studies in Science Education involve gathering data from students, teachers, or other people, and therefore pre-approval of the research plan is required to ensure that the plans are consistent with customary ethical and legal standards. Therefore, for most studies, dissertation data gathering may not begin until such approval if formally gained. Details may be found at the web site of the UGA Human Subjects Office (HSO), which carries out the policies of the Institutional Review Board (IRB). https://research.uga.edu/hso/

In outline, students should be aware of the following major principles and realities in planning to comply with these requirements:

• Formally, at UGA, the Major Professor must be listed as the Principal Investigator on the IRB application, and the student as an additional investigator. Details of how the student and Major Professor work together to gain IRB approval vary in practice. Often the student does the primary work of drafting each of the elements of the IRB application and the Major Professor proofreads/edits and formally “checks off” on each stage of the application on the IRB site.
• Both students and faculty must pass a formal online training course administered by the Collaborative IRB Training Initiative (“CITI”) before any study will be approved. In the event
that 5 years have elapsed since the applicant last passed CITI, the training must be successfully
repeated.  https://research.uga.edu/hso/citi-training/

- All research participants must usually complete a Consent Form, and those who are
  minors must usually also have such a form completed by a parent or legal guardian.
- Video recording as a form of data gathering in educational research is often highly valuable, but
  is also often particularly problematic from an ethical and legal standpoint.
- The UGA HSO advises allowing a minimum of one month for approval of an application once it
  is completed. HSO staff are charged with enforcing very important and often complicated ethical
  and legal principles, but in general they are extremely helpful. In the experience of most of our
  students and faculty, their responses to initial applications and to the customary rounds of minor
  revisions to them are extremely rapid – for carefully prepared applications for the types of
  studies common in our program, the time required for approval is quite often much less than one
  month. “The earlier, the better,” however.
- In most cases, separate approval must also be gained for the study from administrators in any
  school district(s) involved, or at least from the Principal(s) of the school(s) involved. Often this
  process takes much more time than the UGA process, with the relevant school district
  committees often not meeting during the summer months and sometimes only monthly or even
  less often during the academic, year, so allowances should be made accordingly.
- Unfortunately, sometimes a “Catch-22” situation will arise, in which full UGA approval must
  wait for approval from at least one of the schools or districts proposed to be involved, while
  some schools or districts will not consider approving an application until it is approved first by
  UGA! Usually such difficulties can ultimately be resolved, but this is yet another reason to plan
  ahead to the greatest extent possible.

Approval of the Dissertation

Details about the role of the Major Professor and of the other members of the committee in working
with the student during dissertation research are left to the discretion of the Major Professor and
committee, and vary somewhat in practice. Most often only the Major Professor is in regular contact
with the student during dissertation work, although sometimes other members of the committee are
significantly involved, and in general the Major Professor should keep the other committee members
updated as to the student’s general progress. Normally, the Major Professor will first approve a complete
written draft of the dissertation before distributing that document to the other members of the committee
for their critique and tentative approval. It is common for the student to go through several cycles of
revisions to the draft document, incorporating changes, often minor but sometimes major, required or
strongly suggested by the Major Professor. Any member of the committee may also suggest or require
changes to the written dissertation before an Oral Defense meeting is scheduled.

The student and the Major Professor must formally advise the other members of the student's
advisory committee, and the Graduate Coordinator must notify the Graduate School, about the
scheduling of the Final Oral Defense of the Doctoral Dissertation at least 14 days in advance of the
meeting. At our state university, these meetings are open to any member of the university community,
and their scheduling is listed on the Graduate School’s publicly available web site
(https://gradstatus.uga.edu/Announcements/G118). In addition, customarily other faculty and students in
the program and department are actively encouraged to attend via an email announcement distributed by
either the Major Professor or the Graduate Coordinator.

Like the Oral Preliminary Exam, this meeting customarily begins with an initial “executive session”
discussion among the faculty only. The student is then typically expected to make an initial overview
presentation of the dissertation study, normally of about 15 minutes in length, and is then asked to
respond to any follow-up questions, requests for clarification, or invitations to informed speculation that
any member of the committee may have based on the written document and/or initial presentation.
Customarily these discussions are moderated by the Major Professor and initiated primarily by the members of the committee, but the opportunity may also be offered for any others attending the defense (most often other faculty or doctoral students, but sometimes also relatives or friends of the student) to contribute further questions or comments.

For the dissertation to be approved, members of the committee must certify by their signature on the appropriate form (http://grad.uga.edu/wp-content/uploads/2014/11/body_appphddis.pdf) their approval of the written dissertation and that the student passed the oral defense. A maximum of one dissenting vote is acceptable, although extremely rare. It is expected that most students will need to perform at least some revisions to the written dissertation after the defense – in most cases, most members of the committee will check off a result of “approved with suggested changes” on the signature form. Verification of such changes may be delegated to the Major Professor, or one or more other committee members may insist on personally approving the revised document.

After a successful final oral defense of the dissertation and when the successful completion of any suggested changes has been verified by the Major Professor, as indicated by her/his additional signature on the bottom line of the approval form, the form will be submitted to the Graduate School and the student must electronically submit the dissertation to the Graduate School for final approval, both usually by the deadline for graduation in the current semester (typically 1-2 weeks before the end of classes), but not later than the last day of classes of the following semester. The Electronic Thesis and Dissertation Submission and Approval Form may be found at http://grad.uga.edu/wp-content/uploads/2014/09/etd_approval.pdf.

In order to graduate in the same semester as the defense meeting is held (which most often is the intent and fervent hope of students and Major Professors), there are several earlier Graduate School deadlines that must be met in the preceding months of that semester. Please consult http://grad.uga.edu/index.php/current-students/important-dates-deadlines/ for details.

Requirements for Graduation
• Have met all of the deadlines specified immediately above.
• Maintain an overall 3.0 Grade Point Average for all graduate courses.
• After admission to candidacy, a student must register for at least one additional semester and a minimum of 10 semester hours of appropriate credit. (At least three hours of ESCI 9300 must be part of this credit.)
• A student must register for a minimum of three semester hours of credit when using University facilities and/or faculty or staff time, and must enroll for at least three hours during the semester in which graduation requirements are completed.
• Complete the Dissertation and Final Oral Defense.
• Meet the following time limits on all work for the doctoral degree (PhD or EdD).
  o All requirements for the doctoral degree, except the dissertation and final Oral Comprehensive Examination, must be completed within a period of six years. This time requirement dates from the first registration for graduate courses on a student's program of study.
  o A candidate who fails to complete all degree requirements within five years after passing the Comprehensive Examination and being admitted to candidacy will be required to take the Comprehensive Examinations again and be admitted to candidacy a second time.
• In general, meet all requirements for Ph.D. or Ed.D. graduation as specified in the University of Georgia Graduate School Bulletin (http://grad.uga.edu/index.php/current-students/policies-procedures/graduate-bulletin/graduate-bulletin-a-c/), which is the definitive word on this issue and from which the list above has been copied.
Sources of Ongoing Support

While students’ First-year Advisors or Major Professors are understood to be their primary source of advice and support, there are several other people in the program, department, and college offices who can be of great help if a doctoral student knows who to ask, and about what kinds of information or problems:

- Dr. Daniel Capps, Assistant Professor, Graduate Coordinator for Science Education Programs, 111 Aderhold, dacapps@uga.edu: Overall overseer of substantive aspects of all of the graduate degree programs in Science Education other than MAT, including doctoral programs. He should be able to answer any general or specific questions about requirements, procedures, customs, culture, etc. of the Science Education doctoral programs. As Chair of Graduate Programs Committee meetings, Dr. Capps also moderates and often initiates discussions among the faculty about any perceived issues and problems with graduate courses and programs and their possible solutions, both short- and long-term.

- Dr. Julie Kittleson, Associate Professor, Program Coordinator for Science Education, 111 Aderhold, jkittl@uga.edu: Aside from general oversight of all Science Education program matters, Dr. Kittleson is specifically in charge of scheduling ESCI courses, assigning the faculty and/or Teaching Assistants for them, and coordinating the assignment of other assistantship duties. Dr. Kittleson also assigns office space for students with assistantship appointments. As Chair of Science Education Program Faculty meetings, Dr. Kittleson also moderates and often initiates discussions among the faculty about any perceived issues and problems with any aspect of our programs and their possible solutions, both short- and long-term.

- Dr. Kevin Moore, Associate Professor, Graduate Coordinator for the Department of Mathematics and Science Education, 111 Aderhold, kvcmoore@uga.edu: Although Dr. Moore substantively oversees only the Mathematics Education graduate programs, the UGA Graduate School officially recognizes only one official Graduate Coordinator per department, so when any form or letter needs to be officially signed by the Graduate Coordinator, he needs to do it. Normally, however, such forms should be routed initially to Dr. Capps for substantive approval and will then be passed on to Dr. Moore.

- Ms. Katrina Niedlinger, Student Affairs Professional II, Assistant to the Graduate Coordinator, 105 Aderhold, katrinaa@uga.edu: Ms. Niedlinger keeps official lists and records of all current and prospective graduate students in the department, including all application and admissions matters and processing of Graduate School paperwork such as Advisory Committee Forms, Programs of Study, scheduling of Comprehensive Exams and Dissertation Defenses, etc. More importantly, Ms. Niedlinger is the person who can communicate most effectively, directly, and quickly with the Graduate School office, and in most cases has a more detailed, reliable, and current knowledge of fine details of their rules, procedures, and personnel than do either of the Graduate Coordinators. In an emergency, she also has the authority to sign forms on behalf of Dr. Moore, if given substantive permission by Dr. Capps.

- Dr. Roger Hill, Professor and Department Head, 105 Aderhold, rbhill@uga.edu. Although a member of the faculty in the Workforce Education program in the Department of Career and Information Studies, Dr. Hill recently became our Department Head because of his past administrative experience and expertise in the College of Education. Anything that involves requests for financial support from the department for particular activities, issues or problems among students and/or faculty that may be personally or legally sensitive, or requires official communication with other departments or with the College of Education Dean’s Office or higher UGA administration will most likely be referred to Dr. Hill by Dr. Capps or Dr. Kittleson.

- Dr. Georgia Hodges, Assistant Research Scientist, Master of Arts in Teaching (MAT) Program Coordinator, georgiahodges@uga.edu, and Dr. J. Steve Oliver, Professor, soliver@uga.edu, 111 Aderhold. For doctoral students assigned as a TA, or enrolled for ESCI 9700 credit, in courses in...
the Secondary Science teacher certification program, Dr. Hodges or Dr. Oliver are likely to be able to answer any questions about duties and available resources in connection with those. These two faculty members are the ones most frequently assigned to teach those courses, including both Methods courses and overall supervision of Student Teachers. As Chair of Secondary Program Committee meetings, Dr. Oliver also moderates and often initiates discussions among the faculty about any perceived issues and problems with the Secondary Science Teacher Education program and their possible solutions, both short- and long-term.

- Mr. Justin Barnett, Business Manager, 105 Aderhold, jebarnet@uga.edu: Mr. Barnett is the person to see about both substantive issues and paperwork having anything to do with department money, such as arranging to get paid for assistantship work or reimbursed for authorized travel or other expenses incurred for department purposes.

- Office of Information Technology, 232 Aderhold: The people to see for borrowing any electronic equipment for teaching or research purposes, or technical questions about how to use it or why it doesn’t seem to be working correctly (notably including classroom computers, projectors, and SmartBoards in rooms 215-216 and 220). https://coe.uga.edu/directory/offices/information-technology?redirectedfrom=/oit

UGA Graduate School Web Site Links

In all cases, specific rules, regulations and requirements established by the Graduate School and published on its web site supersede any information given here that is specific to the Science Education program, whose policies and procedures supplement but do not supersede those of the Graduate School. When in doubt, it is always a good idea to consult the latest version of the Graduate School’s officially published word about any issue. Here are links to some of the most commonly consulted pages:

- PhD program requirements (nearly all also applicable to EdD): http://grad.uga.edu/index.php/current-students/policies-procedures/academics/types-of-degrees-offered/doctor-of-philosophy-phd/
  - Admission
  - Residence
  - Time Limit
  - Research Skills Requirements
  - Advisory Committee
  - Programs of Study
  - Acceptance of Credit by Transfer
  - Grade Average
  - Comprehensive Examination
  - Admission to Candidacy
  - Dissertation Planning
  - Dissertation Approval and Defense
  - Submitting the Dissertation
  - Application for Graduation


- Deadlines for each semester: http://grad.uga.edu/index.php/current-students/important-dates-deadlines/

- Bureaucratic Forms: http://grad.uga.edu/index.php/current-students/forms/

- Online Application: https://www.applyweb.com/ugagrad/
Miscellaneous Technical Details (that otherwise might become Frequently Asked Questions)

- The Graduate School’s Continuous Enrollment Requirement:
  The UGA Graduate School requires students in all graduate degree programs to register (for at least 3 semester hours of credit) for at least 2 of the 3 semesters in each academic year until graduation, with the year operationally defined as consisting of the Fall, Spring, and Summer Semesters in that order. Some logical corollaries of this include:
  
  o The simplest version of this rule, and its core intent, is that a student is not permitted to take two or more consecutive semesters off from formal registration.
  
  o “Taking Summer off” from formal registration for courses is permitted, and in fact is fairly common, provided that the student was registered for both the preceding Fall and Spring semesters.
  
  o There is a “loophole” that occasionally may become relevant, which is that a student may, without technically violating this rule, take off a Summer Semester and the following Fall Semester, provided that s/he was enrolled for the preceding Fall and Spring Semesters and enrolls for the following Spring and Summer Semesters.

  Students who are unable to comply with the Continuous Enrollment Requirement may petition the Graduate School for an approved Leave of Absence. Normally such petitions are granted only in the case of extreme personal hardship (usually in the nature of a serious illness suffered by either the student or an immediately family member), and normally require that the Major Professor and/or Graduate Coordinator file a letter of support for the student’s petition.

- “Spirit of the Law” vs. “Letter of the Law” for the PhD Residency Requirement:
  It is technically possible to earn the PhD (vs. EdD) degree despite not being (in spirit) a full-time student for at least one year, provided that the Graduate School’s rules are formally followed to the letter. At a minimum, this means enrollment for at least 9 semester hours of credit in each of two consecutive, academic year (Fall or Spring) semesters, with that minimum of 18 hours also being part of at least 30 uninterrupted hours of enrollment. Students admitted and enrolled in the EdD program may, with the permission of their Major Professor and the Graduate Coordinator, change their degree objective to PhD in the event that they find that they are newly able to technically fulfill this requirement.

- Conferral of Lower-level Graduate Degrees on Doctoral Students:
  For doctoral students in Science Education, unlike the custom in many science content departments, there is no history of, or provision for, offering a lower degree “in course” of our doctoral program, e.g., conferring a master’s degree upon the completion of coursework, or a Specialist degree upon advancement to doctoral candidacy. With some exceptions not relevant to our doctoral programs, (e.g., the UGA undergraduate Honors Program or the new “Double Dawg” programs that were recently approved at the undergraduate/master’s level) the UGA Graduate School does not allow students to be degree-seeking students at two levels simultaneously.

  Occasionally, doctoral students who have taken extensive coursework may decide, for a variety of reasons, that completing the doctoral program has become either not possible or not particular desirable for them, given their career plans and overall life priorities. In some cases it may be appropriate for such students to officially change their degree objective to either MEd, MA, MAT, or EdS, if their existing coursework wholly or nearly fulfills the minimum requirements for those degrees. Such students may qualify to graduate with that lower degree if they also fulfill the appropriate “capstone” requirement for the degree, e.g., MA thesis, EdS research project, or MEd or MAT portfolio. Such students would be required to re-apply to the doctoral program if they wished to resume doctoral work in the future.
# Checklist/Schedule for “Jumping through Hoops”: The Message of this Document in a Nutshell

<table>
<thead>
<tr>
<th>Approximate Time (often later for part-time students)</th>
<th>What is To Be Done</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 1</td>
<td>Deadline to complete an application (see “Application Process Checklist” below) for prospective full-time students wishing to start in Summer or Fall and maximize the probability of being offered a Graduate Assistantship appointment, or any student wishing to start in Spring Semester</td>
</tr>
<tr>
<td>&lt;=3 weeks after application</td>
<td>Admissions decision, assignment of prospective First-year Advisor</td>
</tr>
<tr>
<td>January-February (need to be already admitted by this time)</td>
<td>Typical deadlines for nominations for competitive-application assistantships funded by the Graduate School or College of Education (Presidential Fellowships, Graduate School Assistantships, College of Education Research Assistantships) and Regents’ Out-of-state Tuition Waivers</td>
</tr>
<tr>
<td>Spring Semester, most typically</td>
<td>Formal offers of grant-funded assistantships</td>
</tr>
<tr>
<td>April-May</td>
<td>Formal offers of Department-funded assistantships</td>
</tr>
<tr>
<td>April 1</td>
<td>Deadline to complete an application (see “Application Process Checklist” below) for starting Summer or Fall Semester, for prospective part-time students or prospective full-time students willing to accept a lower probability of being offered a Graduate Assistantship appointment</td>
</tr>
<tr>
<td>As soon as possible after admission</td>
<td>Meet with First-year Advisor for initial advising</td>
</tr>
<tr>
<td>Fall Semester, most typically</td>
<td>Begin taking courses, strongly advised to include ESCI 8990</td>
</tr>
<tr>
<td>Late 1\textsuperscript{st} or early 2\textsuperscript{nd} year</td>
<td>Reach agreement with one of the Science Education faculty to establish relationship as Major Professor</td>
</tr>
</tbody>
</table>
| ASAP after appointment of Major Professor             | Form a full Doctoral Advisory Committee:  
- at least 4 faculty  
- at least 3 holding Graduate Faculty status  
- at least 2 from Science Education (1 may be adjunct)  
- at least 1 from outside Science Education (may be adjunct)  
- no more than 1 from outside UGA |
| ASAP after appointment of committee                   | Hold initial committee meeting:  
- Agree on Preliminary Program of Study  
- Discuss very preliminary dissertation research interests/plans |
| Not later than 2\textsuperscript{nd} year             | Begin to plan possible topics and approaches for 9600 Research Internship experiences, aiming for a presentation- or publication-worthy product |
| 2\textsuperscript{nd}-3\textsuperscript{rd} year       | Complete coursework (usually much later for part-time students) |
| Late 2\textsuperscript{nd} or early 3\textsuperscript{rd} year | Schedule committee meeting to discuss:  
- Final Program of Study  
- Dissertation plans, plans for initial development of Prospectus  
- Question topics and scheduling of Written Comprehensive Exam |
<p>| &gt;=2 wks, after completion of Written Exam             | Hold Oral Comprehensive Exam meeting; (often) further develop dissertation plans and discuss initial progress of Prospectus at same meeting |</p>
<table>
<thead>
<tr>
<th>Usually within several months after Oral Comp</th>
<th>Complete Prospectus acceptable to Major Professor, schedule committee meeting to discuss and hopefully approve. If Publishable Paper requirement has also been met, possibly Apply for Admission to Candidacy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No later than during 4th year (full-time) or end of 6th year (part-time)</td>
<td>Achieve admission to Candidacy, begin work on Dissertation study.</td>
</tr>
<tr>
<td>Before end of 4th year (full-time); No later than 5 years after Candidacy</td>
<td>Complete dissertation draft acceptable to Major Professor.</td>
</tr>
</tbody>
</table>
| Beginning of the semester in which graduation is expected | File Application for Graduation with Graduate School.  
Enroll for at least 3 credit hours of ESCI 9300.  
Make sure that at least 10 hours of enrollment will have been completed after Candidacy by the end of this semester. |
| >= 2 weeks in advance | Schedule Oral Defense of Dissertation – see deadlines for this and other checkpoints (Application for Graduation, Format Check, Electronic Submission, etc.) for the semester in question. |
| No later than one semester after Oral Defense | Complete any required changes to dissertation, graduate (!) |
Appendix: Application and Admission Procedures and Criteria

Doctoral students must meet the general requirements for admission to the University of Georgia Graduate School and also be recommended for admission to our program by the Science Education faculty.

For admission for Summer or Fall semester, a complete application (see details below) must be received by April 1; for admission for Spring Semester, by November 1.

Important note: For applicants intending to start the program full-time, with a Graduate Assistantship appointment, beginning in Summer or Fall Semester, the highly recommended application deadline is also November 1. Because many kinds of competitive-application assistantship positions first become available in January, prospective students admitted before the end of the calendar year are significantly more likely to be offered Assistantship positions, nearly all of which begin in Fall Semester. Early application is much less important, but still encouraged, for those wishing to start the program part-time or who do not wish to apply for a Graduate Assistantship appointment for some other reason.

Beyond the minimum quantitative standards established by the Science Education faculty or the Graduate School (see details below), admissions decisions at the doctoral level are based on a painstaking and holistic evaluation of applicants' qualifications by the entire Science Education faculty. Admission requires both a positive vote from a majority of the faculty and the expressed willingness of at least two of the faculty to serve as the applicant's First-year Advisor and therefore potentially as Major Professor. Review of completed doctoral admissions applications takes place on a “rolling” basis, at faculty meetings held roughly every three weeks throughout the academic year. Admission is not official until an applicant is formally notified via postal mail by the Graduate School, but the recommendations of the Science Education faculty are nearly always confirmed, and the Graduate Coordinator will notify applicants of the substantive admissions decision immediately via e-mail or telephone.

Minimum quantitative admissions standards are the same for the Ed.D. and Ph.D. programs in Science Education, and include:

- **Grade Point Average (GPA, on a 4-point scale):**
  - undergraduate GPA of 3.0
  - graduate GPA of 3.5
- **Graduate Record Examination (GRE) General Test**
  - Minimum total (sum of Verbal and Quantitative scores) of 300 (1050 on the older scale)
  - Minimum 146 (550 on the older scale) on the Quantitative portion
- **Test of English as a Foreign Language (TOEFL) (applicable when English is not an applicant's first language):**
  - minimum total score (sum of all 4 sections) of 80
  - minimum score of 20 on the Speaking and Writing sections
- **Science Teaching Experience:** At least 3 full-time years of science teaching experience, or its equivalent in a setting consistent with the candidate's career goals (e.g., very extensive college Teaching Assistantship experience in science), is highly recommended.

Note: The minimum GPA, GRE, and teaching experience standards above are guidelines established by the Science Education faculty, and are potentially flexible in cases in which an applicant's other qualifications are judged by the faculty to be exceptionally strong. The TOEFL standard is a completely inflexible Graduate School requirement.

**Application Process Checklist**

Please submit the following, as indicated:

- **To the UGA Graduate School:**
  - (online) application
- GRE (General test; Verbal and Quantitative) score report: Self-reports or unofficial copies of GRE score reports are acceptable for preliminary substantive consideration by the faculty. Official, original documents, sent directly to the Graduate School office by the Educational Testing Service or forwarded directly from institutions previously receiving them, are eventually required for admission to become official.
- Transcripts from each undergraduate or graduate institution attended in the past: Self-reports of majors and GPAs and/or unofficial copies of transcripts are acceptable for a preliminary substantive consideration by the faculty. Official transcripts, sent directly to the Graduate School office from previously attended institutions, are eventually required for admission to become official.
- An original, official TOEFL score report (if applicable)

- At least 3 letters of reference/recommendation, preferably specifically addressing in detail the applicant's potential for doctoral-level study in science education: These may be completed either online via email links generated by the Graduate School’s application web site, or sent directly to the Graduate Coordinator for Science Education Programs via email attachment, postal mail, or fax. Writers of recommendations should be aware that the minimal “checkoff” form provided by the Graduate School’s online database is generally not considered sufficient for doctoral-level applications in Science Education, and that detailed prose comments are of crucial importance.

- To the Graduate Coordinator for Science Education Programs, preferably via email attachment:
  - A Statement of Purpose summarizing the applicant’s current professional standing, envisioned future career goals, and possible research interests
  - An academic writing sample representing the applicant’s ability cogently to communicate in English about topics in science or science education (recommended length at least 5 pages; often a major course paper or conference presentation, could be an entire master's thesis or published research paper or report)

- Request for interview with faculty committee:
  - Because of the highly individualized and personal nature of doctoral programs and the substantial time commitment required, a more personal sense of the "fit" between a prospective student and the program and its faculty facilitates more informed decision-making about both admissions and enrollment. An interview (either in person, by telephone, or via internet audio/videoconference technology such as Skype or Google Hangouts) with at least two current members of the Science Education doctoral admissions screening committee is required. An interview is normally scheduled after all or most of the required application materials are complete, and is normally scheduled through the Graduate Coordinator or another member of the committee.

- Request for interview or other communication with other faculty (optional, but advisable):
  - Because a doctoral program is ultimately centered on specific research interests and projects, applicants are strongly advised to familiarize themselves with the specific areas of expertise and research interests of the program faculty, and to contact members of the faculty with whom they believe they might work best in the context of research. Such initial contact can often be important in considerations by faculty members regarding willingness to serve as First-year Advisor and therefore potentially as Major Professor.