Science Education Doctoral Program  
Curriculum and Instruction (Ph.D. or Ed.D)  

Admission Requirements  

1. Submit a complete Graduate School application  
2. Master's degree  
3. Grade point average of 3.0 or above in graduate work  
4. GRE Scores  
5. Three professional letters of recommendation, e.g. professors or relevant educational employers.  
6. Interview, including the following:- discussion of essay- questions regarding application folio- other schools applicant is applying to- VT faculty with whom they have consulted about admissions- whether or not the candidate has previously applied to VT etc.  
7. Relevant teaching experience: Three or more years of K-12 teaching or other significant teaching experience  
8. An essay outlining and describing the experiences you bring to the doctoral program and your career goals. Please address the following two questions in the essay.  

1. What is motivating your decision to enroll in a doctoral program at this time? What are your professional goals related to this desire? How are your aspirations compatible with the program to which you are applying? What are the special characteristics and/or skills you would bring to your program of interest?  

2. What is your personal philosophy of teaching and learning in your content area? How has your philosophy manifested itself in your practice over the years? What issues have you encountered in your content area that interests you? As a part of your response, please share the following: a) example(s) of a particularly difficult or challenging teaching scenario that you have experienced in your career, how you handled the situation, and what you learned from it; b) example(s) and explanation of what you would consider your greatest success(es) in your career as a teacher; and c) a description of your teaching "self" based on what you would imagine your students' perceptions of you to be.  

9. A writing sample exemplifying scholarly work [a master's thesis or a sample of professional writing such as a published article or sample of an exemplary academic paper from previous graduate work.  

10. TOEFL (Test of English as a Foreign Language) scores are required of all international students whose first language is not English, except those applicants who have graduated from an accredited university where English is the language of instruction. The university-wide minimum requirement is 80 for Internet, 213 for Computer, and 550 for paper. TOEFL scores are not required of US permanent residents and US naturalized citizens.  

11. A current resume or vita that includes these points:  
   • Record of Professional Experience including teaching, counseling, publications, or other related professional activities  
   • Teaching and/or Professional Certificates held  
   • List of Academic Honors, Awards, Prizes, or other Recognition received  
   • Co-Curricular or Community Service Activities (in order of importance to candidate)
**Exam Guidelines**

Students enrolled in the doctoral program must pass four exams as part of the degree requirements. Four faculty members (including student advisor) will serve on the student's committee and will evaluate student written and oral exams.

**Scheduling Exams**

Students should consult the Teaching and Learning Post-Master's manual to determine the appropriate time in their program to work with their advisor about scheduling each exam. The process of scheduling examinations is as follows:

1. The student meets with advisor to determine the exam topic as well as possible dates and time for the exam.
2. The student must contact all other committee members, providing them with a range of proposed dates and times in order to establish an acceptable date to convene for the oral exam.
3. Students must submit the written portion of the exam to the committee a minimum of two weeks prior to the exam oral component.

**Qualifying Exam**

Post-master's students are required to take a Qualifying Examination prior to or upon completion of 12 to 15 semester credit hours work beyond the master's degree, including work submitted for transfer, or during the second semester of enrollment. A post-master's student who wishes to offer for transfer 12 or more credit hours beyond the master's level must successfully complete the Qualifying Examination either at the time of the initial admission process or during the first semester of enrollment. This examination has both a written and an oral component.

NOTE: The Qualifying Examination is a Department examination and not a University requirement.

The Qualifying Examination serves three purposes:

1. provides evidence for the advisory committee to confirm or reject the initial admission decision
2. presents the committee with an evaluation of the student's present level of competency in the areas of study represented by credit hours offered for transfer
3. serves as a basis for a committee review and acceptance or modification of the proposed Plan of Study, including a review of previous coursework to determine need for revalidation.
The qualifying exam provides students with an opportunity to assemble the core of the doctoral committee. The qualifying exam includes the submission of a document, the composition of which is structured in cooperation with the student, advisor and committee members. The document may take various forms while still fulfilling the purposes of the qualifying exam. Examples include the following:

1. a scholarly paper suitable for publication in which the student discusses theories and concepts from the initial doctoral courses in order to unpack, investigate, or illuminate relevant past educational experiences or current trends and issues within their field.
2. Responses to a series of exploratory questions posed by the committee that allows the student to demonstrate a developing understanding of the theories and concepts presented in the student's initial post master course work.

Preliminary Exam

Every post-master's degree student must take a Preliminary Examination, usually both written and oral. It is designed, conducted, and evaluated by the student's five-member (or more) Advisory Committee to deal with the student's major field as well as other areas of needed competency. Its purpose is to allow the advisory committee to assess whether or not the student is academically prepared for the final work for the doctorate.

Each exam after the Qualifying is designed to move the student toward the dissertation stage. Therefore, following the earlier assessment of competency and preparedness for doctoral work (through the Qualifying Examination), the preliminary exam is used to explore the student's areas of interest in research and her or his familiarity with major concepts and literature in those related areas. The goal is to both identify and inform a potential focus of inquiry, preliminary to the dissertation proposal. Therefore, for the preliminary examination, the student shall:

1. In consultation with the advisor and committee, identify an area of research interest and the fields related to that central area of interest;
2. In the written document, provide a context for the paper, specifically, the background and reasons for choosing the central and supporting areas;
3. Explore the fields through an explication of major concepts as well as through a review of the literature;
4. Based on the review, outline possibilities for the dissertation inquiry, including ideas for a site, participants, and research questions. This should be in outline form only; the prospectus is the comprehensive proposal.

Goals for the oral component of the exam include the following:
1. Based on the students' scholarship, composition of the written examination, and ability to discuss the material, a decision will be made regarding successful completion of the preliminary exam; and
2. The committee will discuss the outline for the study and will advise the student on the viability of the idea(s) as well as suggest further areas to investigate.
Prospectus Exam

All students expecting to complete the doctoral program must take the Dissertation Prospectus Examination. This Examination consists of the submission of a proposal presenting the nature of the problem, the formally prepared design of research, and the review of the literature to the Advisory Committee. This examination is conducted by the student's Advisory Committee.

The examination covers matters such as:

- relevance of the topic
- ability of the student to conduct the research
- completeness of the prospectus
- appropriateness and completeness of the design of research and the review of the literature
- appropriateness of the make-up of the committee (including advisor) for the direction of the proposed study

Final Examination

The final oral examination covers the dissertation and its relationship to the general area of the dissertation topic. The examination is scheduled through the Graduate School. In the examination, the committee is concerned with the success with which the candidate carried out the study approved in the Dissertation Prospectus and how well she/he can explain and interpret the results of the study. In addition, the candidate is responsible for form, style, structure, and technical accuracy. The prospectus for the dissertation and the design of research have already been agreed upon at the Dissertation Prospectus Examination and are not the subject of this examination.
Example Plan of Study (Science Education)

**Research** (15 hours)
- Foundations of Educational Research and Evaluation
- Education and Anthropology
- Ethnographic Methods in Education
- Qualitative Methods I
- Quantitative Methods I

**Dissertation**
- 30 hours Ph.D.
- 24 hours Ed.D.

**Foundations** (9 hours min)
- Schooling in American Society
- Cognitive Processes and Educational Practice
- Analysis of Educational Concepts

**Concentration** (12 hours min)
- Ed. Applications of Microcomputers
- Principles of Instructional Design
- Models of Teaching
- Curriculum Theory and Organization
- Human Relations in the Classroom
- Educating Exceptional Learners Across the Lifespan
- Adolescent Development
- Field Studies and Internships

**Cognate** (9 hours min. in field of inquiry)
- Main Themes of History of Science and Technology
- Cultural Studies of Science, Technology and Medicine
- Issues in Bioethics

* Ph.D (96 min hours required)
  Ed.D. (90 min hours required)