EDUCATION - DOCTOR OF PHILOSOPHY (PHD)

Overview

The School of Education offers a single doctoral degree in education. The degree has seven program areas of emphasis, from which a student chooses:

- Educational Foundations, Policy and Practice
- Equity, Bilingualism and Biliteracy
- Learning Sciences and Human Development
- Literacy Studies
- Research and Evaluation Methodology
- STEM Education
- Teacher Learning, Research and Practice

Requirements

Required Courses and Credits

Students must successfully complete 44 credit hours of approved coursework, with 12 credit hours of core courses (see below) taken as a doctoral cohort during the first two years of study. The remaining 32 credits are completed in the student's area of emphasis. Students work with their faculty advisor to develop an individualized, coherent program of study that includes advanced theoretical, methodological and writing experiences.

Students must maintain at least a B (3.0) average with no grade lower than a B- while enrolled.

Students must complete 30 hours of dissertation credit. Students must be registered for a minimum of 5 dissertation hours per semester after successful completion of their comprehensive exam.

All PhD students are required to take the following four courses in their first and second years:

Code	Title	Credit Hours
EDUC 8210	Ways of Knowing in Educational Research	3
EDUC 8220	Introduction to Educational Research and Policy	3
EDUC 8230	An Introduction to Quantitative Methods in Educational Research	3
EDUC 8250	Qualitative Research Methods in Education	3
Total Credit Hours		**12**

Area of Emphasis Course Requirements

Code	Title	Credit Hours
Educational Foundations, Policy and Practice		
Specialty Seminar [1]		*2*
EDUC 6929	Readings in Educational Foundations Policy and Practice	
Specialty Area Coursework		*15*
Course options (examples):		
EDUC 5015	International / Comparative Education	
EDUC 5075	Sociology of Education	
EDUC 5085	History of American Education	
EDUC 6210	Education Policy and the Law	
EDUC 6220	Gender Issues in Education	
EDUC 6240	African American Education in the United States	
EDUC 6250	Higher Education in the United States	
EDUC 6260	Transnational Migration, Education, and Citizenship	
EDUC 6325	Anthropology of Education	
EDUC 7055	Philosophy of Education	
EDUC 7446	Policy Issues in Education	
EDUC 8055	Theoretical Issues in Education Policy	
EDUC 8125	Seminar: Radical Education Theories	
Advanced Methods		*9*
Minimum nine hours of advanced research methods courses; these courses may be in advanced qualitative or advanced quantitative methods and may be taken in the School of Education or in other departments of the University. Students concentrating in History of Education or Philosophy of Education may choose to fulfill this requirement with courses in historiography or philosophical inquiry, respectively. These must be chosen in consultation with the faculty advisor. Avanced research methods courses do not include required School of Education Core or Specialty Area courses.		
Course options (examples):		
COMM 6410	Discourse Analysis	
EDUC 7386	Educational Evaluation	
EDUC 7396	Latent Variable and Structural Equation Modeling	
EDUC 7456	Multilevel Modeling	
EDUC 7456	Multilevel Modeling	
EDUC 8710	Measurement in Survey Research	
EDUC 8720	Psychometric Modeling: Item Response Theory	
EDUC 8730	Advanced Qualitative Data Analysis	
SOCY 7026	Feminist Research Methods	
SOCY 7121	Qualitative Analysis	
Writing Seminar		*3*
EDUC 8940	Scholarly Writing for Graduate Students	
or EDUC 8950	Proposal and Dissertation Writing	
Electives		*3*
Total Credits		*32*
Equity, Bilingualism, and Biliteracy		
Specialty Seminar [1]		*2*
EDUC 6927	Readings in Equity, Bilingualism and Biliteracy	
Specialty Area Coursework [2]		*12*
EDUC 8615	Designing for Linguistic Diversity in Education Research	
EDUC 8620	Language and Power	

EDUC 8630	Bilingual and Biliterate Development in Children and Adolescents	
EDUC 8640	Rethinking Disability	
Advanced Methods		*9*
Minimum nine hours in advanced methodology, preferably aligned with the methods to be used during dissertation research. Possible School of Education courses include the courses listed below, but methodology classes may be taken outside of the School of Education. Advanced research methods are doctoral level courses and do not include required School of Education Core or Specialty Area courses.		
Course options (examples):		
EDUC 6504	Issues and Methods in Cognitive Science	
EDUC 7386	Educational Evaluation	
EDUC 7396	Latent Variable and Structural Equation Modeling	
EDUC 7456	Multilevel Modeling	
EDUC 8348	Human Development in Cultural, Historical, and Sociopolitical Contexts	
EDUC 8710	Measurement in Survey Research	
EDUC 8720	Psychometric Modeling: Item Response Theory	
EDUC 8730	Advanced Qualitative Data Analysis	
Writing Seminar		
EDUC 8940	Scholarly Writing for Graduate Students	
or EDUC 8950	Proposal and Dissertation Writing	
Electives		*6*
These courses must be selected in consultation with the faculty advisor and are typically at the 6000-level or higher.		
Total Credits		*32*
Learning Sciences and Human Development		
Specialty Seminar [1]		*2*
EDUC 6928	Readings in Learning Sciences and Human Development	
Specialty Area Coursework		*12*
Twelve hours selected with the faculty advisor's approval from 8000-level. Typically these are comprised of the four LSHD doctoral core courses, which are offered on a rotating basis:		
EDUC 8310	Design of Learning Environments for Radical Possibilities	
EDUC 8348	Human Development in Cultural, Historical, and Sociopolitical Contexts	
EDUC 8358	Critical Introduction to Learning Theory and Practice, Part 1	
EDUC 8359	Critical Introduction to Learning Theory and Practice, Part 2	
Advanced Methods		*6*
Minimum of six credit hours (equivalent to 2 semester-long courses) in advanced research methods, selected in consultation with your doctoral advisor. Advanced research methods are doctoral level courses and do not include required School of Education Core or Specialty Area courses.		
Writing Seminar		*3*
EDUC 8940	Scholarly Writing for Graduate Students	
or EDUC 8950	Proposal and Dissertation Writing	
Electives		*9*
A minimum of three credit hours of Electives must be taken outside of the School of Educaiton, unless three credit hours taken outside of the School of Education are counting towards the Advanced Methods requirement.		
Total Credits		*32*
Literacy Studies		
Specialty Seminar [1]		*2*
EDUC 6925	Readings in Curriculum and Instruction	
Specialty Area Coursework		*12*
Minimum twelve hours of the advanced doctoral courses in literacy studies are required to be taken within the first four years. Students will enroll in the following four courses. They can be taken in any order, there is no predetermined sequence.		
EDUC 8100	Historical and Contemporary Issues in Literacy Research	
EDUC 8101	Theories of Literacy Research and Practice	
EDUC 8102	Literacy & Humanities Research Methods	
EDUC 8103	Special Topics in Literacy Research	
Advanced Methods		*6*
Minimum six hours of coursework in qualitative, quantitative, and/or mixed methodologies. Courses must be graduate level and may be taken within or outside of the School of Education. Advanced research methods do not include required School of Education Core or Specialty Area courses. For those students also pursuing the Teacher Learning, Research and Practice area of emphasis, one advanced methods requirements can be met through EDUC 7115.		
Writing Seminar		*3*
EDUC 8940	Scholarly Writing for Graduate Students	
or EDUC 8950	Proposal and Dissertation Writing	
Electives		*9*
Total Credits		*32*
Research and Evaluation Methodology		
Specialty Seminar [1]		*2*
EDUC 6926	Readings in Research and Evaluation Methodology	
Specialty Area Coursework		*15*
EDUC 7326	Quasi-Experimental Design in Causal Inference in Social Sciences	
EDUC 7396	Latent Variable and Structural Equation Modeling	
EDUC 7456	Multilevel Modeling	
EDUC 8240	Applied Regression Analysis	
EDUC 8710	Measurement in Survey Research	
Advanced Methods		*9*
An additional qualitative methods course to be taken following the completion of EDUC 8260. We also strongly encourage students to take EDUC 7386 Educational Evaluation and 8720 Psychometric Modeling: Item Response Theory.		
Electives		*6*
Total Credits		*32*

STEM Education		
Specialty Seminar [1]		*2*
EDUC 6925	Readings in Curriculum and Instruction	
Specialty Area Coursework		*9*
EDUC 8177	Advanced Seminar in Curriculum and Policy in Mathematics & Science Education	
EDUC 8178	Advanced Seminar on Learning in Math & Science Education	
EDUC 8179	Advanced Seminar in Mathematics and Science Teaching & Teacher Education	
Advanced Methods		*6*
Minimum six hours in either qualitative or quantitative methods. Options within and outside of the School of Education may be chosen in consultation with advisor. Advanced research methods do not include required School of Education Core or Specialty Area courses.		
Course options (examples):		
EDUC 8710	Measurement in Survey Research	
EDUC 8720	Psychometric Modeling: Item Response Theory	
EDUC 8730	Advanced Qualitative Data Analysis	
COMM 6410	Discourse Analysis	
Writing Seminar		*3*
EDUC 8940	Scholarly Writing for Graduate Students	
or EDUC 8950	Proposal and Dissertation Writing	
Electives		*12*
Total Credits		*32*
Teacher Learning, Research and Practice		
Specialty Seminar [1]		*2*
EDUC 6925	Readings in Curriculum and Instruction	
Specialty Area Coursework		*9*
Choose three of the following courses:		
EDUC 7115	Critical Inquiry into Becoming a Teacher Educator	
EDUC 8115	History and Policy Issues in Teaching and Teacher Education	
EDUC 8135	Theories and Methodologies for Examining Teacher Learning	
EDUC 8145	Designing for Teacher Learning and Teacher Education	
Advanced Methods		*6*
In addition to EDUC 7115, six hours of advanced methods (qualitative or quantitative) are required. The six remaining credit hours are met through courses selected from within or outside the School of Education in consultation with the faculty advisor. Advanced research methods do not include required School of Education Core or Specialty Area courses. Although there are several courses that might fulfill this requirement, examples might include but are not limited to those noted below.		
Course options (examples):		
ANTH 7300	Seminar: Ethnographic Research Methods	
COMM 6410	Discourse Analysis	
EDUC 8710	Measurement in Survey Research	
EDUC 8730	Advanced Qualitative Data Analysis	
LING 6310	Sociolinguistic Analysis	
LING 7800	Open Topics in Linguistics	
SOCY 6121	Qualitative Methods	
SOCY 7026	Feminist Research Methods	
SOCY 7171	Special Topics	
WGST 6190	Feminist Methodology	
Writing Seminar		*3*
EDUC 8940	Scholarly Writing for Graduate Students	
or EDUC 8950	Proposal and Dissertation Writing	
Electives		*12*
Total Credits		*32*

1 Each program area of emphasis requires a one-credit, specialty seminar course to be taken both fall and spring semesters of the first year. Additionally, first year PhD students participate in a "Professional Seminar" that meets five times each semester. This course is required to fulfill the credits earned in the fall and spring "Readings" (specialty seminar) course.

2 EDUC 5615 Language Acquisition for Bilingual Learners and EDUC 5635 Education and Sociolinguistics are required if not already taken prior to entering the PhD program.

Dissertation Credit

All doctoral students must take a minimum of 30 dissertation hours (EDUC 8994 Doctoral Dissertation).

Students are allowed to take up to 10 hours prior to passing their comprehensive exam. Once students pass their comprehensive exam, they must be registered for a minimum of 5 dissertation hours every semester. Students may be registered for 3 hours if they are "off-campus" status, meaning they are not on appointment and are not taking any coursework hours.

Students must be registered for a minimum of 5 dissertation hours during the semester they defend.

Publishable Paper Requirement

In addition to coursework requirements, doctoral students should be immersed in ongoing research with faculty as early in their program as possible. All doctoral students in the School of Education (SOE) are required to complete, at a minimum, one "publishable paper" by May of their third year in the program.

Please see the School of Education Student Handbook (https://www.colorado.edu/education/student-handbook/) for more information on this requirement.

Comprehensive Examination

Before admission to candidacy for the doctoral degree, students must pass a comprehensive examination, or "comps," in the field of concentration. Students must be registered on the Boulder campus as regular degree-seeking students during the semester that the comprehensive examination is taken. The examination is conducted by an examining board, or comprehensive exam committee.

The comps committee shall consist of the major advisor (chair) and two additional SOE or CU Boulder faculty members. The SOE Associate Dean for Graduate Education and the Associate Dean for Research serve as additional pro-forma (non-examining) committee members. The chair

must have a regular Graduate Faculty appointment. Other committee members must have regular or special Graduate Faculty appointments.

Students must schedule comprehensive examinations with the SOE by completing an application for candidacy form and emailing soe.gradvise@colorado.edu with the names of their comps committee members and the date of their exam at the beginning of the semester they plan to take their exams. Students should also request a room booking at this time for the oral component of the examination. For remote oral examinations, the chair must set up the Zoom room for the event.

Successful candidates must receive affirmative votes from a majority of the members of their examination board. A candidate who fails the examination may attempt it once more after a period of time determined by the examination committee.

Please see the School of Education Student Handbook (https://www.colorado.edu/education/student-handbook/) for more information on this requirement.

Dissertation Proposal Committee

Once students have successfully passed their comprehensive examination, they should consult their faculty advisor to constitute their dissertation/proposal committee.

The dissertation/proposal chair must be a faculty member who is rostered in the doctoral candidate's program area who holds a regular Graduate Faculty Appointment (GFA). In the event that the doctoral candidate would like a dissertation chair from another program area, they may be invited to serve as a co-chair. Once the candidate and the dissertation chair have agreed on the topic of the dissertation, they should proceed together to identify the full dissertation/proposal committee.

Consistent with the Graduate School's requirements, the dissertation/proposal committee must consist of at least five persons, one of whom must be from outside the student's major department. Three committee members must be CU Boulder Graduate Faculty, and all could be SOE faculty members. Up to two committee members could be external to CU Boulder (i.e., not faculty members at CU Boulder) as long as they have appropriate GFAs.

The chair of the committee must have regular membership on the graduate faculty; the other committee members must have either regular or special Graduate Faculty appointments (GFAs). If a student is pursuing a joint or dual-degree, at least two of the committee members must hold graduate appointments in the student's SOE program area. Special membership, which includes faculty from other institutions, requires the approvals of the Associate Dean for Graduate Education and the Graduate School.

The entire list of prospective committee members must be submitted to the Graduate Program Coordinator at soe.gradvise@colorado.edu and approved by the Associate Dean for Graduate Education at the start of the semester during which the proposal will be defended, and then re-approved at the start of the semester during which the dissertation will be defended.

Please check the deadlines sheet for dates and consult the School of Education Student Handbook (https://www.colorado.edu/education/student-handbook/) for more information.

Dissertation Proposal and Oral Defense

The dissertation proposal is a forward-looking document that outlines the doctoral candidate's proposed terrain of study through elaborating the following: a justification for the study; the conceptual framework and review of relevant literature; and the methodology. The written document should provide a clearly articulated and defensible stance, one which will provide the basis for further discussion among and planning by the proposal committee.

The dissertation proposal must describe the proposed study in sufficient detail so that members of the committee can judge the significance of the intended research and the adequacy of the planned study methods.

The oral defense of the dissertation proposal is a meeting where the candidate and five members of the committee agree to the purpose and methods of the proposed study. All members of the PhD examining committee ("dissertation/proposal committee") are expected to participate in the proposal oral defense and sign the formal proposal examination form. After the dissertation committee members have reviewed the proposal and signed the proposal signature page it must be sent electronically to soe.gradvise@colorado.edu.

If the proposed study involves human subjects, the doctoral candidate must obtain the approval of the University of Colorado Boulder Institutional Review Board (IRB). A copy of the IRB approval of the proposed research must accompany the signed proposal signature page when it is submitted to the Graduate Programs Coordinator.

Please see the School of Education Student Handbook (https://www.colorado.edu/education/student-handbook/) for more information.

Dissertation (Final) Defense

PhD students must be registered as full time, regular degree-seeking students at CU Boulder for a minimum of 5 dissertation hours during the semester in which they pass the final examination.

Consistent with the Graduate's School's requirements for the final PhD examination (i.e., the dissertation defense), the dissertation committee must consist of at least five persons, one of whom must be from outside the student's major department. Three committee members must be CU Boulder Graduate Faculty, and all could be SOE faculty members. Up to two committee members could be external to CU Boulder (i.e., not faculty members at CU Boulder) as long as they have appropriate GFAs.

The chair of the committee must have regular membership on the graduate faculty; the other committee members must have either regular or special Graduate Faculty appointments (GFAs). If a student is pursuing a joint or dual-degree, at least two of the committee members must hold graduate appointments in the student's SOE program area. Special membership, which includes faculty from other institutions, requires the approvals of the Associate Dean for Graduate Education and the Graduate School.

The entire list of dissertation committee members must be submitted to the Graduate Program Coordinator at soe.gradvise@colorado.edu and (re)approved by the Associate Dean for Graduate Education at the start of the semester during which the dissertation will be defended.

Doctoral candidates must deliver the final dissertation text to all committee members at least three weeks before the scheduled dissertation defense. This allows the committee two weeks to review and evaluate the dissertation. The Chair will request that committee members provide substantive feedback, preferably in writing, about the dissertation

whether the document is defense-ready. If it is not ready, the candidate is given more time to work on it and the defense will be rescheduled.

After the PhD dissertation has been accepted for defense by the student's dissertation committee, a final examination on the dissertation is conducted by the committee. Students must notify the Graduate School of their final oral examination at least two weeks before their scheduled examination date. The examination must be scheduled no later than the posted deadline for the semester in which the degree is to be conferred.

All members of the final PhD examining committee ("dissertation committee") must participate in the final examination/dissertation defense, with the mode of participation (e.g., in person, remotely) defined by the committee and approved by the Associate Dean for Graduate Education.

More than one dissenting vote disqualifies the candidate in the final examination. A student who fails the examination may attempt it once more after a period of time determined by the examining committee.

After successful completion of the dissertation defense, all members of the final PhD examining committee ("dissertation committee") must sign the formal final examination form.

Students must upload the completed, final draft of the approved dissertation to the Graduate School according to Graduate School procedures and deadlines.

Please check the deadlines sheet for dates and consult the School of Education Student Handbook (https://www.colorado.edu/education/student-handbook/) for more information.

Transfer Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 21 credit hours, and is accepted only after approval of the faculty advisor and the Graduate Programs Coordinator, in consultation with the Associate Dean of Students. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

Transfer coursework must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level coursework as a degree-seeking student on the CU Boulder campus with a 3.0 GPA. Students who have applicable credits to transfer to their PhD degree program must complete the transfer of credit paperwork.

Time Limit

The doctoral degree must be completed within six years, including defending the dissertation and submitting it to the Graduate School. A one-year extension may be granted if formally requested in writing, recommended by the student's faculty advisor, and approved by the Associate Dean of Students and the Dean of the Graduate School. The extension request must show valid reasons as to why an extension is needed. If an extension is granted, all degree requirements must be completed within the extended time period.

Establishing State Residency

PhD students who move to Colorado from another state need to petition for Colorado in-state tuition classification within one year so they are eligible for in-state tuition during second year of graduate study. Proof of residency includes a Colorado driver's license and vehicle registration, voter registration, filing Colorado income taxes and proof of employment. Students should save a signed copy of their Graduate Student Assistantship offer letter to serve as proof of employment.

Detailed instructions on how to apply for Colorado residency (also called domicile) can be found on the Office of the Registrar's State Residency webpage (http://www.colorado.edu/registrar/students/state-residency/).

Areas of Emphasis

Educational Foundations, Policy and Practice

Faculty and students in the Educational Foundations, Policy and Practice (EFPP) program area focus on the interdisciplinary study of educational policy and practice. We bring together the foundational disciplines—including history, philosophy, sociology, anthropology and law—as well as critical perspectives from curriculum theory, gender studies and queer theory, to analyze pressing issues in educational policy and practice. Our program area explores the relationships between schools and the various social, political and economic forces that structure educational aims, institutions and practices.

Through multiple methodologies and partnerships with schools, districts and communities; students work collaboratively with faculty to explore intersectional questions of equity, justice and opportunity. EFPP also is home to the National Educational Policy Center (NEPC), which provides high-quality information and sound evidence in support of democratic deliberation about education policy. The program prepares graduate students for careers in research and teaching in university settings, roles in state government, school districts and policy organizations, research firms, as well as work with community organizations and nonprofits.

Students will have the opportunity to:

- Deepen their understanding of the social, political and economic forces shaping education, and develop nuanced and intersectional understandings of equity and justice.
- Critically reflect on the historically contested aims of public education, and evaluate how educational policies and practices advance or undermine such aims.
- Explore different critical theoretical lenses, disciplinary perspectives and methodologies for understanding and evaluating educational policy and practice.
- Work with faculty, peers, schools and communities to pursue rigorous and ethical research projects that address important questions in educational policy and practice, such as the importance and nature of public education.

Equity, Bilingualism and Biliteracy

The Equity, Bilingualism and Biliteracy (EBB) program area seeks to understand and critically respond to issues at the intersection of language, culture, ability and identity; educational and social policies; teacher preparation and teacher learning; and the social and political contexts of schooling. This includes critical explorations of, and interventions related to, the various aspects of schooling that affect multilingual learners and their communities, such as the development of bilingualism and biliteracy, restrictive language and literacy policies, high-stakes accountability, teacher education, disproportionate representation in special education, racio-linguistic ideologies, the implementation

of various bilingual education models, immigration policies and transnationalism. EBB aims specifically to prepare critical, equity- and justice-oriented researchers, teacher educators, and school, district and community leaders. Our EBB graduates go on to work and lead in universities; state, federal and local education agencies; and in school districts and community-based organizations.

Learning Sciences and Human Development

Faculty and students in the Learning Sciences & Human Development (LSHD) program area study how people learn in the context of organizing for more equitable and sustainable social futures. We consider how research can inform social change that strengthens learning and teaching in K-12 schools, access to higher education for minoritized students and the sustainability of community-based education organizations. Working in partnership with schools and communities is a key component of the approach we take to understanding sociopolitical and educational issues and their possible solutions.

The LSHD program prepares graduate students to research and inform collective efforts to improve conditions of learning, particularly for young people from minoritized and marginalized communities and the adults (including teachers, community organizers and community members) who work with them. The program emphasizes:

- How a strong foundation in psychological perspectives on education and human development can inform efforts to improve conditions for learning in school and out of school contexts.
- The need to go beyond psychological perspectives to interpret learning and development in social, cultural and historical contexts.
- Social justice as a central concern in studying and informing efforts to improve conditions of learning.
- Humanistic approaches to research that draw on interpretive, critical and social practice theories of human action.

Students work with faculty members who conduct research in a range of settings, including schools, preservice teacher education programs, after-school programs, museums, community organizations, workplaces and grassroots social movements. We encourage prospective applicants to review the web pages of individual faculty to learn about current projects.

Literacy Studies

Faculty and graduate students in the Literacy Studies program study and design literacies in print and multimodal modes and in varied contexts. Literacies are framed as central to envisioning and enacting expansive and justice-centered theories and practices for teaching, learning, imagination and self-expression in K-12 schools, informal learning spaces and communities. Grounded in critical, social and interpretive conceptions of literacy, our program highlights the interrelations among theory, research, practice, policy and the potential for equitable social change.

Through multiple methodologies, research in the program occurs in partnership with children, youth, families and teachers in ways that honor and attend to experiences and identities at the intersections of race, language, gender, sexuality, ability and economic opportunity. Doctoral students collaborate with faculty on a range of research projects, engage in community outreach and work in teacher education programs emphasizing social justice and humanizing approaches to curriculum and instruction that center and address the interests and needs of all learners. The program prepares graduate students for careers in research and teaching in university settings, educational leadership in schools and community organizations and research and development in the private or nonprofit sector.

Students will have the opportunity to:

- Develop an expansive understanding of literacy and its implications for children, youth and their families and communities.
- Understand the theoretical perspectives informing literacy research currently and historically.
- Critically examine and apply research methodologies to questions of significance to them and to the field of literacy studies.
- Collaborate with faculty, peers, youth, communities and other educators to pursue research and pedagogical goals.
- Deepen their understanding of theories and practices that situate literacy as essential for dismantling systems of oppression and building toward anti-racist, anti-oppressive and affirming futures for children and youth, teachers, teacher educators, schools and communities.

Research and Evaluation Methodology

The Research and Evaluation Methodology (REM) program is a place for intellectually curious and motivated students who want to learn about deep research methodology with an eye toward influencing education policy and practice. The most common methodological specializations are:

- Psychometrics and educational assessment
- Applied statistics

The program is a full-time commitment, and all admitted students are supported with five years of funding, including tuition remission and a stipend for living expenses. Students participate in graduate research assistant-ships each semester and can expect to work with faculty on research projects as part of CADRE (http://www.colorado.edu/cadre/cadre-projects-and-resources/), the Center for Assessment, Design, Research and Evaluation.

STEM Education

The STEM Education program offers students an opportunity to build their understanding and expertise in STEM Education. The faculty in the STEM program area have expertise in science, mathematics and computer science in pre-college learning environments with a special focus on diversity and justice. Some faculty members are also affiliates with Engineering departments, and others support college-level learning environments in STEM disciplines. The program supports students in becoming educational researchers through participation in the doctoral cohort and STEM specific coursework. Students develop an understanding of how learning environments can be designed to foster students' understanding of and participation in STEM domains. Our faculty work with collaborators throughout campus and in partnership with teachers, schools, districts and community members. As part of their studies, PhD students have opportunities to work on funded research projects, teach courses, contribute to ongoing work of multiple CU centers, and enroll in courses across specializations in the School of Education. The PhD prepares students for careers in research and teaching in university settings; educational service and public leadership for schools and community organizations; or research and development in the private or nonprofit sectors.

The STEM Education community shares commitments to:

- Viewing learning as changes in participation in STEM pursuits with learning environments that always involve issues of identity and power;
- Collaborating with teachers, public schools, and community organizations as partners in broadening and re-envisioning STEM education to include more humanizing experiences and outcomes;
- Recognizing how current values and traditions of STEM disciplines need to be de-settled to expand what counts as knowing and to be a knower;
- Building and studying programs that engage and sustain learners and their communities through engagement in meaningful and relevant STEM questions; and
- Contributing to youth empowerment and agency by drawing on cultural, everyday, and disciplinary knowledges and practices to explore meaningful questions in their communities.

Teacher Learning, Research and Practice

The Teacher Learning, Research & Practice (TLRP) program area is for people interested in conducting research and supporting and engaging the practice of teaching and teacher education. Being a teacher educator is a hybrid role combining both research and practice. The Teacher Learning, Research and Practice program is centrally concerned with disrupting the historical legacy of inequalities perpetuated by teacher education. Grounded in equity- and justice-oriented frameworks, TLRP coursework emphasizes the complexities of teachers' learning experiences and processes, as well as broader contexts of teaching and teacher education.

TLRP doctoral students enjoy opportunities to work in and with the school's multiple teacher preparation programs and to collaborate with faculty, other doctoral students and additional stakeholders (e.g., school partners; community organizations) in the critical design and study of these programs. Participating in teacher education and conducting research with members of this community also provides opportunities to deepen understandings from coursework and to pose and pursue questions using a range of research methodologies and methods.

Learning Outcomes

By the completion of the program, students will be able to:

- Demonstrate both deep knowledge and understanding of a specific area in their field and the ability to use the knowledge to seek and find solutions to important educational problems.
- Demonstrate the research capacities (qualitative, quantitative, and/or mixed methods) needed to conduct original research while also demonstrating sufficient familiarity with other research methodologies to be able to critically read relevant literature in the field.
- Communicate research findings to a broad range of external audiences (scholarly, practitioner, policy makers, communities, etc.).
- Demonstrate knowledge of and contribute to the theoretical and empirical knowledge base on diversity, equity and justice in education.