Frequently Asked Question about the

Blended Delivery PhD in Curriculum and Instruction with a STEM Education Specialization

Texas Tech University

1. **What are the goals for the program?**

   This **PhD** in Curriculum and Instruction program with a **specialization in STEM education** is designed to produce graduates who can "make a difference" in science and mathematics education at the local, state, national or international level with skills as:

   - Pragmatic STEM education researcher.
   - Global STEM educator.

   For each of these outcomes, students in this program will produce a signature product as part of their coursework. For example, as a global STEM educator, students will aid teachers to involve their children or adolescents in collaborative international STEM study and write about this experience for publication. As another example, as a pragmatic researcher, a student might study classroom dynamics when the pupils are engaged in global collaboration.

   To highlight our two trademark outcomes, this program is known as Texas Tech's Global PRiSE doctoral program.

2. **What do we mean by STEM?**

   STEM is an acronym coined by the National Science Foundation some 20 years ago to replace SMET, which NSF had previously been using. As an acronym, STEM stands for science technology mathematics engineering; no more, no less; it's just an acronym. Since STEM has no meaning beyond the four disciplines involved, it behooves us to define what we mean by STEM.

We take a very eclectic approach. By STEM we mean the four individual, independent disciplines plus the interrelationship of two or more of the disciplines. For example, the Next Generation Science Standards includes engineering standards along with science and the NGSS point out connections to mathematics and language arts of the Common Core.

While computers and other teaching technologies are used heavily in the Global PRiSE program, the T of STEM refers to technology in the same sense as technology is used by the ITEEA (International Technology and Engineering Education Association) where technology teachers instruct students about everything from the impact of technology on society to skills needed by a welder or electrician.

We anticipate we will receive applications from K-12 science teachers, math teachers, math/science teachers, and curriculum and instructional specialists in these fields. We may even receive applications from K-12 engineering or technology teachers, although we expect that number to be small.

3. **What do we mean by global STEM educator – the Global part of our name and logo?**

To us global STEM education means that students are working interdependently with students from one or more other countries on scientific inquiry to learn about nature, engineering problem solving to address human desires and needs, and social problems requiring the application of science and/or math. Building on that conceptualization of global STEM education, our students develop skills to help individual teachers or groups of teachers engage their students in global science education, advocate for sound STEM policies based on this understanding of global science education, and conduct research about global science education or other STEM topics, such as argumentation, professional development, or instructional sequences in the context of global STEM education.

4. **What do we mean by the PRiSE part of our name and logo?**

By PRiSE – pragmatic researcher in STEM education – we point out that we are producing STEM education researchers. Of course, this program is a PhD; and the hallmark of a PhD is that the recipient can conduct research at the cutting edge of the field. However, beyond being a researcher, our graduates will know how to and have experienced both (1) direct work with groups of teachers to improve their STEM teaching, whether that be in science or math or some combination of the four STEM fields, and (2) advocacy for sound, research-based STEM policy. Harkening back to the first paragraph of this FAQ, we aim to produce investigators whose research makes a difference for students.

5. **Who should apply for the program?**

Professional STEM educators who wish to become (1) university science or mathematics educators who teach science and/or mathematics teaching methods, student teaching and related courses, (2) STEM education leaders in the K-12 setting, or (3) regional, state, national or international leaders in STEM education. (See application criteria for more information.)

This program does not lead to certification to be a school administrator and it is not intended for people who desire to be a chemist, biologist, physicist or geologist at the university. The focus of this program is on K-12 education and is not for community college or other post-secondary teachers of math, science, engineering or technology *per se*.

6. **How long is the program?**

Assuming a student has completed all of the prerequisites and completes the dissertation on time, the program is 66 hours long, including 54 hours of coursework (i.e., 18 courses at 3 hours each) and 12 hours for dissertation. Students who do not complete their dissertation during those 12 hours need to enroll each semester for three hours of dissertation until it is completed.

Once started, students will continue to take courses for three years and then there is one year for the dissertation. In the event of unforeseen circumstances such as extreme medical trauma, we will make every attempt to work with students thus affected to complete their program in a timely manner. However, we can make no guarantee that we will be able to get a student back on track, if s/he has to stop out for some period of time.

7. **When and how is the program offered?**

The majority of the 66 hours of coursework will be completed online during the fall, spring and summer semesters; but students will also be required to attend as a group:

- three intensive, face-to-face, two-week, July sessions on the Lubbock campus of Texas Tech University toward the end of each of their first three years in the program, and

- national conferences of the National Science Teachers Association or the National Council of Teachers of Mathematics during their first year in the program, Association for Science Teacher Education (typically in January) or the Association of Mathematics Teacher Education (typically in February) during their second year in the program, and a Washington, DC/Capitol Hill experience in the third year of the program. During each of the three experiences, students will meet with Texas Tech faculty as a group for cohort activities as well as attend sessions.

Students must be committed to completing a predetermined set of courses as part of a cohort. Additionally, students will be expected to complete coursework and additional expectations as outlined in the program requirements.

8. **What courses will I take?**

In order to achieve the Global PRiSE outcomes of this doctoral program in STEM education, students will complete 30 hours in research courses (including 12 hours in dissertation) to demonstrate their skill as a STEM education researcher, and six hours each in STEM education change agency, STEM education advocacy, STEM education teacher leadership, and global STEM education. Additionally students will complete 12 more hours of coursework that undergird these five areas. Courses are organized into 18 hours per year for the first three years and 12 hours of dissertation in year four.

Coursework follows the university schedule. Fall courses extend from late August to mid-December. Spring courses extend from early January to early May. Summer courses start immediately after the end of Spring semester courses and end in mid-August.

Year One

Fall – Year One	
EDCI 5377	Using Technology in Science and Math Education (International Emphasis)
Make up one course deficiency, if needed.	
Spring – Year One	
EDCI 5371	Curriculum and Instruction in Science and Math Education (Introduction to Research in Science and Math Education)
EPSY 5380	Introduction to Educational Statistics
Attend national conferences of the National Science Teachers Association (NSTA) or National Council of Teachers of Mathematics (NCTM).	
Summer – Year One	
EPSY 5381	Intermediate Statistics
EDCI 6331	John Dewey
EDCI 5373	Project-Based Learning in STEM
Typically one of the three courses is taught in the first five weeks of the summer term and a second course is taught in the second five weeks; and a third course extends across the ten weeks of the summer term.	
Attend a two week session (dates TBA in July) in Lubbock for the face-to-face portion of coursework and advising about the doctoral program.	

Year Two

Fall – Year Two	
EDIT 5370	Foundations of Distance Education
EDCI 7000	Mentor a teacher partner to engage their students in global STEM education and conduct research about the process.
Spring – Year Two	
EDCI 5372	Assessment Issues in STEM Education
Make up one course deficiency, if needed.	
Attend Association for Science Teacher Education (ASTE) or Association of Mathematics Teacher Educators (AMTE) international conference in January or February.	
Summer – Year Two	
EDCI 5306	Effective STEM Policy Advocacy
EDCI 5386	Constructivist Inquiry Method
EDCI 6306	Comparative International STEM Education
Typically one of the three courses is taught in the first five weeks of the summer term and a second course is taught in the second five weeks; and a third course extends across the ten weeks of the summer term.	
Attend a two week session (dates TBA in July) in Lubbock for the face-to-face portion of coursework and advising about the doctoral program.	

Year Three

Fall – Year Three	
EDCI 5306	Professional Development for STEM Educators
EDCI 6382	Advanced Field Methods as Constructivist Inquirer
Spring – Year Three	
EDCI 7000	Research in Global STEM Mixed-Methods Inquiry
EDCI 6393	Advanced Practicum as a Global STEM Professional Developer
Summer 2016	
EDCI 7000	STEM Education Policy
EDCI 7000	Research (Dissertation Proposal)
Attend Capitol Hill advocacy meeting in Washington, DC, probably in late June.	
We anticipate the policy course will be taught in the first five weeks of the summer term and the proposal course will extend over the entire ten weeks of the summer term.	
Attend a two week session (dates TBA in July) in Lubbock for the face-to-face portion of coursework and written portion of your qualifying exam.	

Year Four

Fall – Year Four	
EDCI 8000	Dissertation (6 credit hours)
Oral portion of qualifying exam in August–September. (Students who do not successfully pass their qualifying exam may be required to enroll in additional coursework.)	
Formal presentation of dissertation proposal in October–December.	
Spring – Year Four	
EDCI 8000	Dissertation (3 credit hours)
Summer – Year Four	
EDCI 8000	Dissertation (3 credit hours)
Dissertation Defense	
Students who do not complete their dissertations by Summer – Year Four will continue to enroll in dissertation research for a minimum of three hours each semester until completion of their degree.	

Every effort has been made to correctly represent the courses you will be taking, but the university reserves the right to modify the courses to be taken or the sequence in which they are taken.

9. **Are there any other expectations?**

Most of your requirements will be included in coursework, but doctoral students who are looking for career advancement frequently take part in degree-related but out of class activities such as:

- Present at a national or international professional conference, such as ASTE or NCTM.
- Submit research manuscripts for publication.
- Submit book reviews for publication.
- Contribute to the writing of a grant proposal.
- Serve as a reviewer of conference proposals.
- Serve as a reviewer of journal manuscripts.

How much does the program cost?

What one pays each semester for their coursework is composed of tuition and a number of different fees which vary from course to course, so it is difficult to say with certainty what you will pay for your courses. However, we can say that tuition and fees for each three hour course is currently about $1300 for a Texas resident and about $2300 for an out-of-state student. Thus, tuition and fees for the basic 66 hours spread over four years in the program are about $29,000 for Texas residents and $51,000 for out-of-state students. Course fees vary; and tuition and fees are subject to change. (Tuition and fees are adjusted each year by the university's Board of Trustees.) Every effort is made to keep textbook costs at a minimum, but textbooks (~ $50-$300 per course) will often be required. Students are responsible for travel, room and board at the three STEM education conferences and the three summer sessions in Lubbock.

Students may apply for financial aid, including scholarships.

10. **What are the prerequisites for admission?**

Applicants must have a master's degree from an accredited institution in STEM education or closely related field such as curriculum and instruction, elementary, middle or secondary education, or a STEM field.

Applicants must have taken a graduate course in each of three areas: curriculum, instruction, and diversity. Any or all of these three courses may apply to a specific field (e.g., elementary math education) or to education in general. Examples of diversity courses include special education, diversity, educational anthropology, or English as a Second Language. Applicants who have not completed these three courses may be admitted with the proviso that they complete their deficiency by the end of the second year in the program.

Applicants must have had at least three years of successful K-12 STEM teaching in a public or private school and/or an informal STEM setting by the start of their first course in the program.

Applicants must have completed undergraduate and/or graduate coursework in STEM consistent with their intended focus level after graduation. For example, applicants intending to work with secondary STEM teachers are expected to have a stronger STEM background than those who plan to work with elementary STEM teachers.

11. **What are the admissions criteria?**

Interested applicants should have:

- A master's degree from an accredited institution in STEM education or closely related field such as curriculum and instruction, elementary, middle or secondary education, or a STEM field with a cumulative GPA of 3.0 or higher.
- Completed a graduate course in each of three areas: curriculum, instruction and diversity.
- An acceptable set of GRE scores. (There is no cut-off score; several types of evidence, including the GRE, are taken into account in the admissions decision.)

- At least three years of successful K-12 STEM teaching in a public or private school and/or an informal STEM setting by the start of their first course in the program.
- A minimum of three references from professionals in the field of education. At least one of the references must speak to the strength of the applicant as a STEM teacher.

Preference will be given to applicants who have significant graduate work in STEM education. Applicants' undergraduate and/or graduate coursework should be commensurate with the grade level – elementary, middle or secondary – at which they plan to work; applicants planning to work at the secondary level are expected to have studied STEM to a greater extent than those who plan to work at lower levels. If you are applying from outside the United States, contact nefertiti.beck@ttu.edu for information about international applications.

12. **When should I apply?**

Start your application process as soon as you are aware a new cohort of students is being recruited.

It takes time for all parts of the application process to be completed; and you don't want to miss deadlines. We cannot emphasize this point enough. You need to start your application now.

We will start to review completed applications on March 1 to form a cohort of approximately 25 students who will complete an informal, non-credit orientation in Summer 2015 and start their first formal, for credit course in Fall 2015.

13. **How do I apply?**

Step 1: Apply to Texas Tech University's Graduate School at
http://www.depts.ttu.edu/gradschool/admissions/

- Submission of Graduate Records Exam (GRE) scores that are five years old or fewer is required. Information about the GRE can be found at gre.org. Apply <u>now</u> to take the GRE.
- International applicants must also submit their Test of English as a Foreign Language (TOEFL) score to the Graduate School.

Step 2: Apply to the College of Education.

- The College of Education requires the submission of an online application portfolio. Details and guidelines, as well as submission instructions, will be found on the College of Education degree website (https://appspace.ads.ttu.edu/EDUCGraduateApplication/Candidate/apply/ApplyForDegree?guid=1a1bc5bb-1e49-42af-bbda-1797410d604d).

Presently work is proceeding to combine steps 1 and 2. Contact nefertiti.beck@ttu.edu, if you have questions.

Step 3: Apply for financial aid at http://www.financialaid.ttu.edu/home/ and/or for general scholarships. (You may apply for scholarships as part of Step 2 (application to the College of Education). Also, go to the Graduate School scholarship website at http://www.depts.ttu.edu/gradschool/scholarships/. Many scholarships have February 15 deadlines.

Step 4: Upon acceptance to the Graduate School and the College of Education, you will work with a faculty advisor to develop a degree plan.

14. **Whom should I contact for more information?**

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