PhD in Learning and Teaching in STEM
Program Area of Study: Mathematics and Statistics Education
(DRAFT 1/15/2016)

Curriculum Display
TOTAL CREDIT HOURS = 60

(after Master's Degree)

Mathematics and Statistics Education students can focus their program of study in learning and teaching mathematics and/or statistics at one of the following three levels:
- **upper/advanced secondary and collegiate level**
- **middle or secondary level (grades 6-12)**
- **elementary level (grades PreK-5)**

Your choice should influence the courses and experiences with which you engage, your dissertation focus, and the requirements for your mathematics and statistics background (see below).

Mathematics and Statistics Education Specific Courses	24 credit hours total	
Foundations course: choose 1 EMS 770 Foundations of Mathematics Education or EMS/ST 7** Foundations of Statistics Education		3
Teaching and Learning course: choose 1 EMS 711 Teaching and Learning of Mathematics 6-14 EMS 712 Teaching and Learning of Mathematics K-8 (Pre-Req: learning theories or a psychology course)		3
Two additional Doctoral level (700 level) courses in Mathematics and Statistics Education EMS 704 Curriculum Development in Math and Science; EMS 705 Education and Supervision of Teachers of Science and Mathematics EMS 792 Special Topics in Mathematics Education; and **Any course not chosen in Foundations or Teaching and Learning categories.**		6
Experiences in Mathematics Education: EMS 841 Practicum in Science and Mathematics Education These experiences are planned in coordination with an advisor and are meant to enhance a student's applicable experience in educational settings This could be one experience of 3 hours or any combination of hours.		3
Seminars and Preliminary Exam EMS 802 (Intro Seminar in Mathematics Education--1 credit, taken within one of the first two semesters at beginning of program) EMS 802 (Advanced Seminar in Mathematics Education-1 credit, taken near end of program)) EMS 890 (Doctoral Prelim Exam - 1 credit minimum)		3
Specialty Courses Take graduate courses (500 or above level) that deepen or broaden your understanding of issues related to the focus of your research and grade level, and future career interests. Courses should be chosen in consultation with your advisor and/or committee members		6

NOTE: All doctoral students need to demonstrate some understanding and competency in the teaching and learning of mathematics/statistics with technology. This could be from a course chosen in their program, prior experiences or courses in a master's degree, or potentially as part of the prelim exam.

Dissertation Research	9 hours
EMS 895 Doctoral Dissertation Research	9

NOTE: For doctoral students either part-time or full-time who are working on their dissertation. Writing the dissertation requires a major commitment of time and effort on both the part of the doctoral student and the faculty advisor. There should be consultation between the student and the dissertation chair about what is expected to be accomplished, and how much time is to be invested before the student registers. The College of Education strongly recommends that students who are registering for dissertation research (895) or preparation (899) register for at least 3 semester hours per semester, when appropriate.

	6 hours
Learning and Teaching in STEM Required Courses 6 hours	
EMS 7** Foundational Learning Theories in STEM Education	3
Contemporary Topics and Issues in STEM Education *topics will change*	**3**

College Core Course Requirements   21 hours

Scholar Leader Courses

	6 total hrs
Scholar Leader: Diversity and Equity in Schools and Communities	3
Scholar Leader: Systemic Change in Education and Society	3

Research Methods	15 hrs
ED 711 Applied Quantitative Methods in Education II or equivalent (See Prerequisite)*	3
ED 730 Introduction to Qualitative Research in Education, *or its equivalent*	3
One Advanced Methods ED 750 Mixed Methods Research in Education ED 731 Advanced Qualitative Research and Data Analysis in Education, or *an equivalent advanced methods course*	3
Additional advanced research course taken from the following: • ED 731 Advanced Qualitative Research and Data Analysis in Education • ED 712 Survey Methods in Educational Research • ED 750 Mixed Methods Research in Education • ED 795 Special Topics in Education Research • A design-based research course • courses in the Department of Statistics or Psychology at the level 500 or above (e.g., ST 505, PSY 880)	3
3 hours of Applied Research Experience EMS 893 Doctoral Supervised Research	3

*PreReq: ED 710 Applied Quantitative Methods in Education, *or its equivalent)*

Mathematical Sciences Requirements
(not included in 60 hrs above)

Between masters and Ph.D. courses, students must show the equivalent of the following coursework for their chosen career focus. These requirements are designed to enhance students' foundation in mathematical sciences and prepare them for a highly competitive job market. The credits listed below could have been taken completely during a masters degree. If not, then students may take some as part of their program of work (6 credits could be taken as part of the Speciality Courses), or credits could be above and beyond the 60 hrs in the PhD plan of work.

Focus on Mathematics or Statistics Education at the upper secondary and collegiate level	**Focus on Mathematics or Statistics Education at the middle or secondary level (grades 6-12)**	**Focus on Mathematics or Statistics Education at the elementary level (grades PreK-5)**
should earn a master's degree in mathematics, applied mathematics, or statistics, or a *strong equivalent* of 30 credit hrs.	at least 18 credit hrs of graduate level mathematics or statistics courses (24 hrs recommended to be competitive in job market).	at least 18 hours of masters or PhD courses in mathematics or statistics content. At least 9 hours must be focused on elementary mathematics content (e.g., from ELM 500 series in mathematics education).
1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____	1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____	1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____