Science Math Education

**Smed 5100** Introductory Graduate Seminar (1 semester hour) An introduction to the resources and opportunities available within the M.A.T. degree programs and the University of Texas at Dallas. (1-0) S

**Smed 5301** Science, Mathematics, and Society (3 semester hours) An exploration of STEM issues in society that impact the teaching of science and mathematics. Students define researchable science and mathematics questions, set up research studies, use mathematics and technology in context, make applications to global STEM issues in society, and study the importance of citizen involvement in the learning and teaching of science and mathematics. (3-0) Y

**Smed 5302** Teaching and Learning of Science and Mathematics (3 semester hours) Theories of learning and teaching in science and mathematics are explored through the lens of metacognition. Students apply metacognition theory and education research techniques to their own learning. Topics include student motivation, causation vs. correlation, cognitive and psychological development (brain research), qualitative and quantitative research methods, validity and reliability of research, ethics of research with human subjects, and decision-making strategies for education issues and policies. (3-0) Y

**Smed 5303** Introduction to Research and Evaluation in Science and Mathematics Education (3 semester hours) Expansion of students' knowledge and application of STEM education research including research approaches to evaluation of curricula and student achievement. Focus on designing research questions concerning current understanding in science and mathematics education and questions for future investigations. What we can know through research and what research cannot/does not tell the teacher will be central to the course. Students explore the appropriateness of specific methods of doing education research in answering particular questions and developing creative education research (as opposed to replication of previous research). Prerequisite: **Smed 5302**. (3-0) Y

**Smed 5304** Reflections on Science and Mathematics Education (3 semester hours) Critical reflection on prior courses in the Science/Mathematics Education core sequence emphasizing metacognition and STEM education research. Students reflect on themselves as teachers and learners, on research-based strategies for overcoming challenges in teaching and learning, and on their own potential for impacting education as individual practitioners and researchers. All students will conduct a small research study. Prerequisite: **Smed 5303**. (3-0) Y

**Smed 6v98** Thesis Research (3-6 semester hours) May be repeated. ([3-6]-0) Y