GEORGE MASON UNIVERSITY | Advanced Studies in Teaching and Learning

cehd.gmu.edu/astl

SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) CONCENTRATION COURSE SHEET

30 credit degree program
(12 credits of Core courses, 18 credits of Concentration courses)

Core Courses: 12 credits *Required for all ASTL M.Ed. students*	**Credit Hours**
EDUC 612: Inquiry into Practice Provides experience using research skills to foster systematic and thoughtful inquiry into classroom practice. Explores relevant classroom practice issues through critical writing, action, and research. Emphasizes cultural diversity and gender issues in research.	2
EDUC 613: How Students Learn Advanced course in study of learning based on research and theory from different disciplines. Focuses on increasing students' learning through study of different learning systems, and understanding each learner in context of learning process itself.	3
EDUC 614: Designing and Assessing Teaching and Learning Explores design and development of curricular, pedagogical, and assessment strategies responsive to needs and interests of students. Investigates factors that affect teaching and learning, and examines multiple ways of knowing that teachers bring to classrooms.	2
EDUC 606: Education and Culture Uses cultural inquiry process (CIP) and web site to acquire cultural, social, and language-related perspectives on educational processes; and teaches skills to analyze educational settings and expand strategies to address puzzlements in students' own practice.	3
EDUC 615: Educational Change Explores influences on educational change at classroom, school, community, state, and national levels. Investigates implications of factors and influences that affect educational change. Analyzes influences and factors, and involves students in reflecting on their own experiences.	2

STEM Concentration Courses	Credit Hours
EDCI 660: Integrated STEM Teaching Provides an interdisciplinary approach to integrating science, technology, engineering, and mathematics (STEM) into teaching practice across all disciplines. Explores aspects of STEM education through literature, recent national reports, discussion, and practice. Involves participation in problem-based and project-based learning activities, inquiry learning, while using technology to gain and display information.	3
In consultation with advisor, choose an additional 5 courses (15 credits) from among the following, with the goal of selecting at least one course from each area:	
Designing Digital Learning in Schools	
EDIT 780: Principles of School-Based Design Develops and applies a comprehensive set of digital design strategies appropriate for creating engaging learning opportunities for students in PreK-12 environments. Emphasizes school-based design principles, design processes, and design patterns at the intersection of technology, teaching. and learning.	3
EDIT 781: Designing for Information Using Explores ways in which PreK-12 teachers can design digital environments that connect learners' ability to search, sort, create, communicate, and synthesize information and information resources with learning activities. Emphasizes teachers' ability to design for digital citizenship and information use.	3
EDIT 782: Designing for Literacy Explores 21st century definitions of literacy related to multiple symbolic environments (e.g. visual, numeric, alphabetic). Examines the practice of design that integrates technology to promote literacy competence across media and across PreK-12 abilities and interests.	3
EDIT 783: Designing for Problem Solving Examines problem solving as an educational goal, as a cognitive process, and as a series of strategies and habits of mind. Emphasizes and provides practice in the design of digital problem solving environments where technology affords opportunities at the intersection of content learning and problems solving	3
Mathematics Education Leadership	
EDCI 644: Mathematics Learning and Assessment (K-8) Introduces students to learning theories and associated assessment practices specific to mathematics education. Intended for mathematics specialists and teachers interested in problems of learning and assessment across K-8 settings in mathematics education.	3
EDCI 645: Curriculum Development in Mathematics Education Analysis, design, and evaluation of school mathematics curricula.	3

EDCI 646: Mathematics Education Leadership for School Change Surveys current literature and large-scale studies in mathematics education. Engages students in research, study, and discussion of factors that affect teaching and learning of mathematics in school settings.	3
MATH 610: Number Systems and Number Theory for K-8 Teachers This course covers the topics: ways of representing numbers, relationships between numbers, number systems, the meanings of operations and how they relate to one another, and computation within the number system as a foundation for algebra. It also includes episodes in history and development of the number system, and will examine the developmental sequence and learning trajectory as children learn this material.	3
MATH 611: Geometry and Measurement for K-8 Teachers The course explores the foundations of informal measurement and geometry 'in one, two, and three dimensions. The van Hiele model for geometric learning is used as a framework for how children build their understanding of length, area, volume, angles, and geometric relationships. Visualization, spatial reasoning, and geometric modeling are stressed. As appropriate, transformational geometry, congruence, similarity, and geometric constructions will be discussed.	3
MATH 612: Probability and Statistics for K-8 Teachers An introduction to probability, descriptive statistics, and data analysis. Topics studied will include the exploration of randomness, data representation, modeling. Descriptive statistics will include measures of central tendency, dispersion, distributions, and regression. The analysis of experiments requiring hypothesizing, experimental design and data gathering will also be discussed.	3
Science	
EDCI 663: Research in Science Teaching Investigates the research and methodology involved in teaching and learning biological, chemical, physical, and earth sciences from K-12.	3
EDCI 670: Advanced Methods in Science Teaching Application of major principles of education and psychology for the improvements of science teaching in secondary schools.	3
EDCI 671: Innovations in Science Teaching Focuses on the development and selection of teaching materials that reflect concepts of technology innovation with an emphasis on middle and secondary school science.	3
PROGRAM EXIT REQUIREMENT	
Professional Development Portfolio: A performance-based portfolio that provides evidence of a teacher's teacher professional learning and development throughout the ASTL program. The portfolio is presented the last spring semester of a student's program.	NA

Advanced Studies in Teaching and Learning (ASTL)
Division of Advanced Professional Teacher Development and International Education
College of Education and Human Development

Dr. Stephanie Dodman (sdodman@gmu.edu)
Dr. Nancy Holincheck (nholinch@gmu.edu)
ASTL Academic Program Coordinators

Advisor and Support Contact List

Concentration	Advisor	Email	Phone
Designing Digital Learning in Schools	Dr. Dawn Hathaway	dhathawa@gmu.edu	(703) 993-2019
Diversity and Exceptionality in PK-12 Schools	Marie Champagne	mchampa4@gmu.edu	(703) 993-3173
Early Childhood Education	Dr. Julie Kidd	jkidd@gmu.edu	(703) 993-8325
Languages (Spanish & French)	Dr. Rebecca Fox *Dr. Jenny Leeman** *Dr. Christy Pichichero**	rfox@gmu.edu *jleeman@gmu.edu* *cpichich@gmu.edu*	(703) 993-4123
Gifted Child Education	Dr. Nancy Holincheck	nholinch@gmu.edu	(703) 993-8136
History	Dr. Mark Helmsing *Dr. Brian Platt**	mhelmsin@gmu.edu *bplatt1@gmu.edu*	(703) 993-2384 *(703) 993-1253*
Individualized	Dr. Nancy Holincheck	nholinch@gmu.edu	(703) 993-8136
International Baccalaureate	Marie Champagne	mchampa4@gmu.edu	(703) 993-3173
Literacy: Reading Specialist	Dr. Jennifer Hathaway	jhathaw2@gmu.edu	(703) 993-5789
Literacy: PreK-12 Classroom	Dr. Jennifer Hathaway	jhathaw2@gmu.edu	(703) 993-5789
Mathematics	Dr. Courtney Baker	cbaker@gmu.edu	(703) 993-5081
Physical Education	Dr. Dominique Banville	dbanvill@gmu.edu	(703) 993-3579
Science K-12	Dr. Nancy Holincheck	nholinch@gmu.edu	(703) 993-8136
STEM	Dr. Nancy Holincheck	nholinch@gmu.edu	(703) 993-8136
Special Education	Jancy Templeton	jtemple1@gmu.edu	(703) 993-2387
Teacher Leadership	Dr. Stephanie Dodman *Dr. Farnoosh Shahrokhi**	sdodman@gmu.edu *fshahrok@gmu.edu*	(703) 993-3841 *(703) 993-2009*
ASTL Core Advisors	Dr. Stephanie Dodman Dr. Nancy Holincheck	sdodman@gmu.edu nholinch@gmu.edu	(703) 993-3841 (703) 993-8136
APTDIE Coordinator of Student Services	Marie Champagne	mchampa4@gmu.edu	(703) 993-3173
APTDIE Support Manager	Felicita Minionis	fminioni@gmu.edu	(703) 993-2794
ASTL program (general)		astl@gmu.edu	(703) 993-2794
ASTL program website	https://gse.gmu.edu/advanced-teaching-studies/		
ASTL Facebook page	https://www.facebook.com/ASTLProgramGMU/		

* *Liaison Contact for Departmental Advising*

Advanced Studies in Teaching and Learning (ASTL)
Program of Study Form

Once you are admitted and you indicate your intent to enroll, contact your Advisor ***immediately***. Advisor information is located in your admissions materials and at https://gse.gmu.edu/advanced-teaching-studies/current-student-information. Complete this form with your Advisor *by the end of your second semester*. What you include on this form is not permanent, and you can adjust as necessary. However, it will provide you with a roadmap for your program. See the Concentration Course Sheet for your specific Concentration for guidance in course selection.

Any changes to your Program of Study should be made in consultation with your Advisor.

Student Name	**Concentration**
Advisor Name	

Notes on Core courses:
The Core classes may be taken concurrently and interspersed with the Concentration courses OR the Core may be taken in a one year block as necessitated by Concentration course availability.
EDUC 612: offered face to face and online; summer only; must be first Core course taken
EDUC 613: offered face to face and online; fall only; must be second Core course taken
EDUC 614: offered face to face and online; fall only; can be taken concurrently with EDUC 613
EDUC 606: offered face to face and online; spring only; can be taken concurrently with EDUC 615
EDUC 615: offered face to face and online; spring only; must be taken the last spring semester of program

Semester	**Semester, Year**	**Course number**	**Credits**	**Concentration or Core?**
(Example)	*Summer 2019*	*EDUC 612* *EDLE 620*	*2* *3*	*Core* *Concentration*
1				
2				
3				
4				
5				
6				
7				
8				

Student's signature		**Date**	
Advisor's signature		**Date**	