

**GEORGE MASON UNIVERSITY
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT
ELEMENTARY EDUCATION PROGRAM**

**EDIC 547.001
Integrating Technology in Elementary Classrooms: Mathematics
1 Credit, Fall 2014**

Meeting Times/Days:

Face-to-Face: 7: 20 – 10:00 Thursday, August 28 & Thursday, December 4

Online: Over the course of the semester

Location: Thompson Hall L013

Professor: Jennifer Suh, Ph.D. and Lesley King

Office Hours: By appointment

Office Location: Thompson Hall, Rm. 2203

Office Phone: 703 993-9119

Email: jsuh4@gmu.edu lking3@masonlive.gmu.edu

COURSE DESCRIPTION:

This course studies the development and integration of technology in the Elementary Education Mathematics curriculum. **Prerequisite(s):** Admission to the Elementary Licensure Program.

Corequisites: This course is offered in conjunction with EDCI 552 Math Methods; therefore, all students must be enrolled in EDCI 552 Math Methods.

LEARNER OUTCOMES/OBJECTIVES:

As a result of EDIC 547, students will be able to:

- a. plan interdisciplinary learning experiences that enable elementary students to integrate knowledge, skills, and methods of inquiry within the Mathematics curriculum;
- b. identify how students differ in their approaches to learning and create instructional opportunities that are adapted to diverse learners;
- c. select appropriate materials, tools, and technologies to achieve instructional goals with all learners.

RELATIONSHIP TO PROFESSIONAL STANDARDS:

To complete this course, you must show evidence that you have satisfied the following National and State teaching standards:

[INTASC \(The Interstate Teacher Assessment & Support Consortium\):](#)

- #6: The teacher understands and uses multiple methods of assessment to engage learners in their own growth to monitor learner progress and to guide the teacher's and learner's decision making.
- #7: The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

[Association for Childhood Education International](#)

- 2.3 Mathematics—Candidates know, understand, and use the major concepts, procedures, and reasoning processes of mathematics that define number systems and number sense, geometry, measurement, statistics and probability, and algebra in order to foster student understanding and use of patterns, quantities, and spatial relationships that can represent phenomena, solve problems, and manage data.
- 3.1 Integrating and applying knowledge for instruction—Candidates plan and implement instruction based on knowledge of students, learning theory, subject matter, curricular goals, and community.
- 3.2 Adaptation to diverse students—Candidates understand how elementary students differ in their development and approaches to learning, and create instructional opportunities that are adapted to diverse students.

[International Society for Technology in Education \(ISTE\)](#) (which covers VA Technology Standards for Instructional Personnel):

- Teachers design, develop, and evaluate authentic learning experiences and assessments incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS•S

[Virginia State Technology Standards for Instructional Personnel:](#)

- 1) Demonstrate effective use of a computer system and utilize computer software.

- 2) Apply knowledge of terms associated with educational computing and technology.
- 3) Apply computer productivity tools for professional use.
- 4) Use electronic technologies to access and exchange information.
- 5) Identify, locate, evaluate, and use appropriate instructional hardware and software to support Virginia's Standards of Learning and other instructional objectives.
- 6) Use educational technologies for data collection, information management, problem solving, decision-making, communication, and presentation within the curriculum.
- 7) Plan and implement lessons and strategies that integrate technology to meet the diverse needs of learners in a variety of educational settings.
- 8) Demonstrate knowledge of ethical and legal issues relating to the use of technology.

NATURE OF COURSE DELIVERY

Students in this course will participate in **two face-to-face meetings** and complete **four learning modules** through online asynchronous classes. Students will read educational research, utilize online resources, and contribute to conversations on discussion boards all within Blackboard. You can access Blackboard through the website - <https://mymasonportal.gmu.edu>.

If you are having a problem accessing the Blackboard Learn environment, try: 1) contacting the ITU Support Center via phone (703-993-8870, Monday-Friday 8 AM – 7 PM), in person (Innovation Hall Room 233, Monday-Friday 8:30 AM – 5 PM), or via email at support@gmu.edu, 2) visiting the CLUB on the 3rd floor of the Johnson Center for face-to-face assistance (Monday-Thursday 9 AM – 7 PM and Fridays 10 AM – 4 PM), and, lastly, 3) emailing courses@gmu.edu if steps 1 and 2 did not resolve your issue. If you have a question about an assignment or due date, you can use your course forums, ask a friend, or revisit the course syllabus. Many other types of questions can be answered by using a search engine like Google.

REQUIRED TEXTS

Van de Walle, J. A., Karp, K. S., & Bay-Williams, J. M. (2013). *Elementary and middle school mathematics: Teaching developmentally* (8th ed.). Upper Saddle River, NJ: Pearson.

COURSE REQUIREMENTS AND ASSIGNMENTS

- A. Class Participation & Attendance (10 points)** This course will meet face-to-face only twice: **Aug. 28 and Dec. 4**. Attendance is mandatory for both classes and notification must be provided to the instructor of an emergency that prohibits you from attending either class. In addition, you are expected to be on time to both classes unless advance notice has been

provided to the instructor. Since we only meet twice it is expected that you are prepared for face-to-face meetings and contribute to class discussions and activities as well as genuinely listening to peers as they do the same. Cell phones are for emergency use only—no texting, social media, or phone class during class time. I encourage you to bring laptops and will ask you to open them only when their use is appropriate or necessary.

This course will also require you to complete four online learning modules. These modules are designed for you to complete on your own and at your own pace. A variety of choices regarding readings and resources have been included within the modules in order for you to personalize your learning towards your specific interests and needs. It is expected that you complete all 4 learning modules in the order presented below and by the due date.

- Assignments are to be completed at your pace throughout the week and turned in, no later than 11:59pm, on the day they are due. Assignments identified as late will receive a reduction in grade of 10% per day late.

- a. TPACK Module **(Sept. 11)**
- b. Virtual Manipulatives **(Sept. 25)**
- c. Teaching Math **(Oct. 16)**
- d. Equity and Opportunity to Learn through Technology **(Nov. 20)**

B. Online Postings and Discussions (30 points each) Due to the online nature of this course, the majority of our discussions will occur online using Blackboard discussion posts. Each learning module contains one discussion post starter with several questions. It is expected that you post your thoughts to the question using the research and resources provided within the module to support your ideas as well as your own personal experience. In addition, you are expected to respond to one classmate and write a substantial comment that extends his/her original post.

C. Internet-based Activities Evaluation [Assignment #1] (15 points) Evaluate 2 internet-based activity (i.e. website, online game, tutorial, online math program) using criteria based on Goldenberg (2000) and excerpts from Underwood et al. (2005). The internet-based activity you analyze should exemplify how technology can be used to enhance mathematics teaching and learning. To complete this assignment, fill out the evaluative template for the internet-based activity. Then write a short reflective paper addressing the following: (a) the math content and key instructional ideas the internet-based activities address, (b) descriptions of how they could be used in the classroom, (c) thoughtful and appropriate suggestions for modification, and (d) an evaluation of the internet-based activities strengths and weaknesses including the benefits and/or drawbacks of using this internet-based activity over other materials. This assignment is due on **Sept. 18** and you should upload your evaluative template along with your reflection paper to Blackboard.

- D. Learning Progression and Technology Selection [Assignment #2] (20 points)** Locate three different virtual manipulatives or applets that support the mathematical content through a learning progression. You will read through a learning progression document available on BB and select 3 applets that support the teaching and learning of a concept. Using the template posted in the online module, analyze the models you have selected and evaluate them on their effectiveness and fidelity to the mathematical concept. This assignment is **due Nov 6.** and the evaluative templates should be uploaded to Blackboard. For virtual manipulatives you can use the following websites or others that are interactive applets:

[National Library of Virtual Manipulatives](#)

[Shodor's Interactive website](#)

[Math Playground](#)

[Illuminations \(be sure to click on the box that searches for lessons with online activities\)](#)

- E. Technology-based Math Lesson [Assignment #3] (25 points)** Design and teach a lesson or activity that uses technology to support a problem-based approach to teaching math. The teaching experience can take place with the whole class, a small group, or even just one student. Examples of this type of activity include using an interactive whiteboard, leading students through a high-quality activity in the computer lab, designing an activity for a learning center, or providing one-on-one remediation or acceleration. Other ideas are also possible; check with the professor before planning the activity. The technology that you choose should support the learning of mathematics rather than being the focus of the lesson (i.e. design a problem that students can solve by using a spreadsheet rather than walking them through a lesson about how to use a spreadsheet). The technology should be an integral part of the lesson, not an optional add-on. This assignment is due on **Nov 20th** should be uploaded to Blackboard **with a presentation on Dec 3rd.**

Assignments Calendar - *Assignments are to be completed at your pace throughout the week and turned in, no later than 11:59pm, on the day they are due. Assignments identified as late will receive a reduction in grade of 10% per day late.*

Class Point Assignments:

Class Participation/Attendance:

10 points

N/A

Online Postings and Discussions:	30 points	<i>See schedule above</i>
Internet-based Activities Evaluation [Assignment #1]:	15 points	Due: Sept. 18
Learning Progression and Technology Selection [Assignment #2]:	20 points	Due: Nov. 6
Technology-Based Math Lesson [Assignment #3]:	25 points	Due: Nov. 20

Grading policies The mathematics education courses in GSE's Elementary Education Program integrate pedagogy and mathematics content appropriate for the elementary school grades. For students to earn a grade of A in the course, they must demonstrate excellence in both the pedagogical knowledge and the content knowledge of the mathematics appropriate at their level of teaching. Thus, the grading in the course is structured to help evaluate fairly student excellence in both areas. Problem sets and assessment work focuses primarily on ascertaining student excellence in handling mathematics content appropriate for the elementary grades, and represents 50% of students' grades. Pedagogical knowledge is ascertained primarily from readings, assignments and participation in the course, and represents 50% of students' grades. Therefore students who demonstrate excellence in both pedagogical knowledge and content knowledge receive grades of A. At George Mason University course work is measured in terms of quantity and quality. A credit normally represents one hour per week of lecture or recitation or not fewer than two hours per week of laboratory work throughout a semester. The number of credits is a measure of quantity. The grade is a measure of quality. The university-wide system for grading graduate courses is as follows:

Grade GRADING Grade Points Interpretation

Grade	GRADING	Grade Points	Interpretation
A+	=100	4.00	Represents mastery of the subject through effort beyond basic requirements
A	94-99	4.00	
A-	90-93	3.67	
B+	85-89	3.33	Reflects an understanding of and the ability to apply theories and principles at a basic level
B	80-84	3.00	
C*	70-79	2.00	Denotes an unacceptable level of understanding and application of the basic elements of the course
F*	<69	0.00	

Note: "C" is not satisfactory for a licensure course

"F" does not meet requirements of the Graduate School of Education

Other expectations Attendance: It is your responsibility to attend all class sessions. You are held accountable for all information from each class session whether you are present or not. Please report your reasons for any absences to the instructor in writing. Tardiness: It is your

responsibility to be on time for each class session. Please report your reasons for any tardiness to the instructor in writing.

TASKSTREAM REQUIREMENTS

Every student registered for any Elementary Education course with a required performance-based assessment is required to submit the assessment (the unit plan website) to TaskStream. Evaluation of the performance-based assessment by the course instructor will also be completed in TaskStream. Failure to submit the assessment to TaskStream will result in the course instructor reporting the course grade as Incomplete (IN). Unless the IN grade is changed upon completion of the required TaskStream submission, the IN will convert to an F nine weeks into the following semester.

GMU POLICIES AND RESOURCES FOR STUDENTS

- a. Students must adhere to the guidelines of the George Mason University Honor Code [See <http://oai.gmu.edu/honor-code/>]
- b. Students must follow the university policy for Responsible Use of Computing [See <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>]
- c. Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. ***All communication from the university, college, school, and program will be sent to students solely through their Mason email account.***
- d. The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experiences and academic performance [See <http://caps.gmu.edu/>]
- e. Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester [See <http://ods.gmu.edu/>]
- f. Students must follow the university policy stating that all sound emitting devices shall be turned off during the class unless otherwise authorized by the instructor.
- g. The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing [See

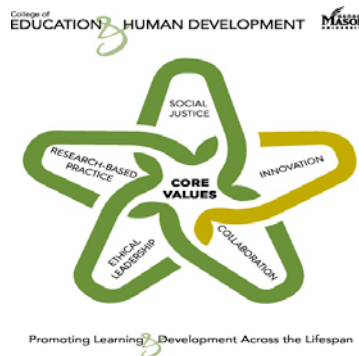
<http://writingcenter.gmu.edu/>]

PROFESSIONAL DISPOSITIONS

Students are expected to exhibit professional behaviors and dispositions at all times.

CORE VALUES COMMITMENT

The College of Education and Human Development is committed to *Social justice, Innovation, Research-based practice, Ethical leadership, and Collaboration*. Students are expected to adhere to these principles. [See <http://cehd.gmu.edu/values>]



GRADUATE SCHOOL OF EDUCATION

For additional information on the College of Education and Human Development, Graduate School of Education, please visit our website [See <http://gse.gmu.edu/>]

COURSE SCHEDULE:

** Instructor reserves the right to adjust syllabus throughout the semester*

Date	Class Topic	Assignments For this Class
Class One Aug. 28	Introduction and instructions for online learning modules	Read Syllabus
Class Two	Learning Module 1: TPACK DUE: Sept. 11	See Blackboard
Class Three	Learning Module 2: Virtual Manipulatives DUE: Oct. 2	See Blackboard
Class Four	Learning Module 3: Teaching Math DUE: Oct. 23	See Blackboard
Class Five	Learning Module 4: Equity DUE: Nov. 13	See Blackboard
Class Six Dec. 4	Class Synthesis and wrap-up.	TBA
Internet-based Activities Evaluation [Assignment #1]: 15 points Due: Sept. 18 Learning Progression and Technology Selection [Assignment #2]: 20 points Due: Nov. 6 Technology-Based Math Lesson [Assignment #3]: 25 points Due: Nov. 20		

EDIC 547 -- RUBRIC FOR PARTICIPATION AND ATTENDANCE

<i>ELEMENT</i>	Unsatisfactory (3 or less pts.)	Basic (4-7 pts.)	Proficient (8-9 pts.)	Distinguished (10 points)
Participation	The student is not prepared for class and does not actively participate in discussions.	The student is sometimes prepared for class discussions, and occasionally participates in group and class discussions.	The student is often prepared and makes active contributions to the learning group and class.	The student is prepared for all classes. The student actively participates and supports the members of the learning group and the members of the class.

EDIC 547 -- RUBRIC FOR POSTINGS AND ONLINE DISCUSSIONS

	Basic (0 Points)	Proficient (3 Points)	Distinguished (5 Points)
Assignments	Two or more assignments were late.	One assignment was late without notification and prior approval from the instructor.	All assignments were turned in on time.
Prepared for Discussions	Student was not prepared for the discussions. There is no evidence that class readings were completed.	Student was prepared for the majority of the discussions. There is some evidence that class readings were	Student was prepared for all discussions. There is evidence that class readings were completed.

Follow-up Postings	Posts shallow contribution to discussion (e.g., agrees or disagrees); does not enrich discussion or does not post to follow- up comments.	Elaborates on an existing posting with further comment or observation.	Demonstrates analysis of others' posts; extends meaningful discussion by building on previous posts.
References and Citations	Includes no references or supporting experience.	Uses no more than one reference to resources or readings and focuses more on personal experience.	Uses several references to resources, readings, and/or personal experience to support comments.
Content Contribution	Posts information that is off-topic, incorrect, or irrelevant to discussion.	Repeats but does not add substantive information to the discussion.	Posts factually correct, reflective and substantive contribution; advances discussion.