George Mason University

EDCI 547-001 Integrating Technology in Elementary Classrooms: Mathematics (1 credit), Fall 2011

Instructor	Dr. Pamela Edwards Johnson
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Class Meets	Section 001: Tuesdays, Nov. 1-Dec. 13, 4:00-6:30; 7 sessions The course is offered in conjunction with EDCI 552 Math Methods.
Office Hours	Monday, 9:30-11:15; Thursday, 2:00-4:00

Prerequisites: Admission to the Elementary Licensure Program.
Corequistites: Enrollment in EDCI 552.
Course description: This course studies the development and integration of technology in the elementary education mathematics curriculum.

NATURE OF COURSE DELIVERY:

Students in this course will participate in individual and group activities that focus on the integration of technology by using computers and other technology resources in class. Students will also participate in large group discussions led by the instructor and in small group discussions and activities with their classmates. Students will also be required to use asynchronous (Blackboard) postings to reflect upon their own learning.

LEARNER OUTCOMES:

This course is designed to enable teacher candidates 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.

Additionally, this course supports the CEHD Core Values of collaboration, ethical leadership, research-based practice, social justice, and innovation. Statements of these goals are at http://cehd.gmu.edu/values/.

PROFESSIONAL STANDARDS:

This course addresses the following National and State Standards:

The 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.

International Society for Technology in Education (ISTE) National Educational Technology Standards for Teachers:

2. Design and Develop Digital-Age Learning Experiences and Assessments:
Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS•S Teachers:

ARTICLES AND RESOURCES:

A. *Teaching Mathematics with Virtual Manipulatives, Grades K-8***,** Patricia S. Moyer-Packenham

B. *Elementary and Middle School Mathematics: Teaching Developmentally (7th Edition),* John A. Van de Walle, Karen S. Karp and Jennifer M. Bay-Williams

C. Journal articles and links to websites posted on Blackboard, available at http://mymason.gmu.edu.

COURSE ASSIGNMENTS, PERFORMANCE-BASED ASSESSMENT, AND EVALUATION CRITERIA:

A. Assignment #1: Students will evaluate three *Illuminations* lesson plans that incorporate a technology tool (http://illuminations.nctm.org/). Students will evaluate the lesson plans based on the manner in which technology is integrated (based on the guidelines for technology integration, as discussed in class) and offer suggestions for modifications. Students will use a template posted on Blackboard to complete this assignment. (20%)

B. Assignment #2: Students will post, on Blackboard, one journal article which focuses on the use of technology in elementary mathematics education. The article should be linked as a PDF, and students should write a three-paragraph summary of how the article will impact their own future teaching of a particular mathematical topic with technology as a support. Suggested journals include: *Teaching Children Mathematics, Mathematics Teaching in the Middle School, School Science and Mathematics, Journal of Technology and Teacher Education, Computers in Schools, Contemporary Issues in Technology and Teacher Education.* (20%)

C. Assignment #3: Performance-based assessment: Modeling Mathematics Concepts Using Applets and Virtual Manipulatives. This assignment includes two parts, as noted below. (40%)

a. Part One: Identify one specific mathematics concept (such as the concept of base ten, place value, linking fractions/decimals/percent, money, time, etc.) and locate at least five different virtual manipulatives or applets that support the learning of that concept (such as those found at the National Library of Virtual Manipulatives, Illuminations, Shodor, etc.) Using a template posted on Blackboard, answer questions about the models you have selected and evaluate them on their effectiveness and fidelity to the mathematical concept.

b. Part Two: Choose one of the models from Part One. Interview one elementary student (i.e. from your placement) and give that student several tasks to perform using the model. Evaluate the effectiveness of the model based on the student's interaction with the virtual manipulative or applet. Include the questions you asked the student, the pluses, minuses, and interesting things you observed, and the math amplified by the model. Specific guidelines are

posted on Blackboard.

D. Group presentation, class participation and attendance. (20%)
a. Students will work in small groups to share a 10-15 minute presentation about emerging uses of technology in mathematics class. Rubric posted on Blackboard.
b. Class participation is also evaluated using a rubric posted on Blackboard. During each class session, students are expected to attend class and arrive on time. Exceptions (due to extreme circumstances) must be discussed with the instructor.
c. Full participation in online discussions and blogs is expected.
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.

WEEKLY SCHEDULE

Date and Topics	**Readings and assignments to be discussed in class.**	**Group presentations**
November 1 Overview of using technology in the math classroom NCTM Process Standards Tool: Online resources	Before class: 1) Log on to Blackboard and view course materials. 2) Read Weist (2001) from Blackboard before class.	
November 8 Technological Pedagogical Content Knowledge (TPACK) Tool: Calculators	Readings: 1)Van de Walle, Chapter 7 2) NCTM's position on calculators 3) Lee, H., & Hollebrands, K. (2008) **Please bring a calculator to class.** **Assignment 1 due Friday, Nov. 11**	1. 2.
November 15 Assessing students through technology Tool: Virtual manipulatives	Readings: 1) Rosen and Hoffman (2009) 2) Moyer-Packenham, Ch. 1-3	1 2.
November 22 **TBD**		
November 29 Using computer technology in "real" classrooms Tool: Spreadsheets	**Assignment 2 due Monday, Nov. 21** 1) Beige (2010) 2) Siegle (2005) 3) Drier (2000)	1. 2.
December 6 Thinking "out of the box" Tool: TBD	Ted Talks Readings TBD	1. 2.
December 13 Reflecting and looking forward	**Assignment 3 due Monday, Dec. 12**	

EVALUATION SCHEMA

Determination of the Final Grade:

Graduate Grading Scale

A	93%-100%	B+	87%-89%	C	70%-79%
A-	90%-92%	B	80%-86%	F	Below 70%

GSE SYLLABUS STATEMENT OF EXPECTATIONS:

A. The Graduate School of Education (GSE) expects that all students abide by the following: Students must adhere to the guidelines of the George Mason University Honor Code [See http://academicintegrity.gmu.edu/honorcode/].

B. 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/].

C. Students must follow the university policy for Responsible Use of Computing [See http://universitypolicy.gmu.edu/1301gen.html].

D. 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.

E. Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.

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

CEHD STATEMENT OF CAMPUS RESOURCES:

A. 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 experience and academic performance [See http://caps.gmu.edu/].

B 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/].

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

Approved March 2004, Revised August 2011.