GEORGE MASON UNIVERSITY
Graduate School of Education

Course Title: Mathematics Education Curriculum Design and Evaluation (K-8)
Program Code: EDCI 856 001 (3 credits)
Fall 2010/Spring 2011

Instructor:	Dr. Margret Hjalmarson	Office Hours:	By appointment
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Office:	207A Commerce II Bldg.	Class Meets:	2nd Saturday Monthly (see schedule for exceptions) Commerce II

I. Course Description

Yearlong seminar for Ph.D. students in the Mathematics Education Leadership cohort program. Students engage in research, analysis, design and evaluation of school mathematics curricula.
Prerequisite: Admission to the Mathematics Education Leadership Ph.D. Program

II. Student Outcomes

At the conclusion of this course, students should be able to:
A. Identify standards-based school mathematics curriculum projects; Analyze key characteristics of outstanding curriculum materials for school mathematics.
B. Examine learning theories that have been influential in mathematics education and identify ways those theories have been translated into curriculum materials and strategies for teaching.
C. Evaluate research on NSF-funded and commercially developed school mathematics curriculum materials to make informed choices.
D. Present and discuss a set of school mathematics curriculum materials in depth.
E. Design a school mathematics curriculum project.

III. Relationship to Program Goals and Professional Organization

EDCI 856 is designed to enable mathematics education leaders to evaluate and develop mathematics curriculum materials appropriate for school mathematics. The course was developed according to the joint position statement of the Association of Mathematics Teacher Educators (AMTE) and the National Council of Teachers of Mathematics (NCTM) on Principles to Guide the Design and Implementation of Doctoral Programs in Mathematics Education.

This position statement indicates that the core knowledge expectations for doctoral study in mathematics education include:

- Design effective curricula and learning environments to facilitate the development of deep and connected mathematical understanding,
- Curriculum design, analysis and evaluation,
- Studies of different strands of curricula,
- Comparisons of international curricula,

- Knowledge of historical, social, political, and economic factors impacting mathematics education, and
- Studies of mathematical concepts across grade levels.

IV. Nature of Course Delivery

The delivery of this course combines methods of lecture, discussion, independent study/research, student presentation, and writing.

IV. Texts and Readings

NSF-Sponsored Curriculum (online resource). The K-12 Mathematics Curriculum Center (www.edc.org/mcc/currcula.htm)

Reys, B. J. , Reys, R. E., & Rubenstein, R. (2010). *Mathematics curriculum: Issues, trends, and future directions*. National Council of Teachers of Mathematics: Reston, VA.

Selected articles will be posted on Blackboard (see list at the end of the syllabus).

V. Course Requirements and Assignments

A. Article Discussion Leading (20%)

Working with a partner, select a research article related to curriculum from the archive found on the CD for the *Mathematics Curriculum* book. Lead a discussion based on the article from the era assigned for that month.

B. Curriculum Research Paper (25%)

Select one mathematics education curriculum project funded by the National Science Foundation (NSF). Conduct an in-depth analysis of the curriculum materials. Research and evaluate the NSF-funded project on a variety of attributes (which may include scope and sequence, relationship to NCTM Standards, content, research on the curriculum, etc.). Use evaluation indicators to identify key characteristics of outstanding curriculum materials in the set of materials. Complete a written analysis identifying areas of weakness in the materials and suggested improvements for the designer.

C. Curriculum Professional Development Project (25%)

Design a professional development session for a particular set of curriculum materials or component of curriculum materials. The session should help teachers or other school leaders to understand the use of the materials in the classroom, their intent and purpose, and how the materials contribute to student learning. You will present the session in class. You may work with a partner on this project.

D. Read and Summarize a Dissertation (20%)

Select a dissertation to read in your topic area of interest. Prepare a presentation for the class about the dissertation including the following sections: background information, research questions, methodology, results, and implications for further research.

E. Update Vita and Cover Letter (10%)

Update your vita and write a cover letter to accompany your CV. The goal of this assignment is to have you critically exam your goals and objectives in the Ph.D. program and articulate those goals to a prospective employer. It is also designed to help you reflect on areas where you might want to do more work or gain more experience.

Attendance. It is your responsibility to attend all class sessions and to be on time for each class session. 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/email.

VI. 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%

The university has a policy that requests students to turn off pagers and cell phones before class begins. All assignments and papers must be written using **APA 6th edition** formatting.

GSE Syllabus Statements of Expectations

The Graduate School of Education (GSE) expects that all students abide by the following:

Students are expected to exhibit professional behavior and dispositions. See gse.gmu.edu for a listing of these dispositions.

Students must follow the guidelines of the University Honor Code. See http://www.gmu.edu/catalog/apolicies/#TOC_H12 for the full honor code.

Students must agree to abide by the university policy for Responsible Use of Computing. See http://mail.gmu.edu and click on Responsible Use of Computing at the bottom of the screen.

Students with disabilities who seek accommodations in a course must be registered with the GMU Office of Disability Services (ODS) and inform the instructor, in writing, at the beginning of the semester. See http://www2.gmu.edu/dpt/unilife/ods/ or call 703-993-2474 to access the ODS.

Approved March 2004, Revised January 2010

VII. Course Schedule

Class meets 10:00 – 3:00 PM, Second Saturdays of the month (note exceptions)

Date	**Topic and Reading** ***Assignment due***	**Dissertation Review**	**Article Leading**
September 11, 2010	Introduction to Curriculum Clements (2007) Baker et al (2010)	N/A	
October 2, 2010 COMBINED	***Updated CV & Cover Letter*** **Ideal Curriculum: National Policy** Common Core Standards Ch. 3 & 5 - MC:Issues Schmidt et al (2005)		19th & Early 20th 1. 2.
November 13, 2010	**Ideal: Pre-School & Elementary Curriculum** Dewey - *Child & the Curriculum* Ch 8 – MC: Issues Ch 14 – MC: Issues		Mid-Twentieth 1. 2.
December 11, 2010	**Curriculum & Students** Stein, Remillard, & Smith (2007) - *Handbook* Schoenfeld (2002) Ch 7 – MC:Issues Ch 24 – MC:Issues	1. 2. 3.	Modern Math Era 1. 2.
February 12, 2011	***Curriculum Research Paper*** **High School & Technology** Post et al (2010) Hollenbeck, Wray, & Fey (Ch. 18 – MC: Issues) Ch. 22 – MC:Issues	1. 2. 3.	Post-Modern Math 1. 2.
March 12, 2011	**Implemented: Teachers & Curriculum** Remillard (1999) Ch. 17, 19, 20 – MC: Issues	1. 2.	Standards-Based 1. 2.
April 9, 2011 COMBINED	***Curriculum PD Project*** Readings TBD	1. 2.	
May 14, 2011 COMBINED	***Curriculum PD Project*** Readings TBD		

Additional Articles

Baker, D., Knipe, H., Collins, J., Leon, J., Cummings, E., Blair, C., & Gamson, D. (2010). One hundred years of elementary school mathematics in the United States: A content analysis and cognitive assessment of textbooks from 1900 to 2000. *Journal for Research in Mathematics Education, 41*(4), 383-423.

Clements, D. H. (2007). Curriculum research: Toward a framework for "Research-based Curricula". *Journal for Research in Mathematics Education, 38*(1), 35-70.

Dewey, J. (1902). *The Child and the Curriculum.* The University of Chicago Press: Chicago.

Hirsch, C. (2007). *Perspectives on the design and development of school mathematics curricula*. National Council of Teachers of Mathematics: Reston, VA.

National Council of Teachers of Mathematics. (2000). *Principals and standards for school mathematics*. Reston, VA: Author.

Post, T. R., Medhanie, A., Harwell, M., Norman K. W, Dupuis, D. N., Muchlinksi, T., … Monson, D. (2010). The impact of prior mathematics achievement on the relationship between high school mathematics curricula and postsecondary mathematics performance, course-taking, and persistence. *Journal for Research in Mathematics Education, 41*(3), 274-308.

Remillard, J. (1999). Curriculum materials in mathematics education reform: A framework for examining teachers' curriculum development. *Curriculum Inquiry, 29*(3), 315-342.

Schoenfeld, A. H. (2002). Making mathematics work for all children: Issues of standards, testing, and equity. *Educational Researcher, 31*(1), 13-25.

Schmidt, W. H., Wang, H. C., McKnight, C. C. (2005). Curriculum coherence: An examination of US mathematics and science content standards from an international perspective. *Journal of Curriculum Studies, 37*(5), 525-559.

Stein, M. K., Remillard, J., Smith, M. S. (2007). How curriculum influences student learning. In F. K. Lester (ed.), *Second handbook of research on mathematics teaching and learning* (pp. 319-370). Information Age Publishing: Charlotte, NC.