I. Course Description

Yearlong seminar for Master’s level students in the Mathematics Education Leadership cohort program. Engages students in analysis, design and evaluation of school mathematics curricula.

Prerequisite: Admission to the Mathematics Education Leadership Master’s Degree Program

II. Student Outcomes

This course is designed to enable students to:
A. Identify standards-based school mathematics curriculum projects K-12; 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 small curriculum project based on key design principals.

III. Relationship to Program Goals and Professional Organization

EDCI 645 is designed to enable mathematics education leaders to evaluate 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 Programs in Mathematics Education.

This position statement indicates that the core knowledge expectations in mathematics education include:
- Design effective curricula and learning environments to facilitate the development of deep and connected mathematical understanding,
- Lead curriculum design, analysis and evaluation,
- Study different strands of curriculum,
- Compare international curricula, and
- Demonstrate knowledge of historical, social, political, and economic factors impacting mathematics education and curricula.
IV. Nature of Course Delivery

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

V. Texts and Readings

Required Texts:


Subscription to *Teaching Children Mathematics* (for the elementary grades) or *Mathematics Teaching in the Middle School* (for the middle grades) journals available from the National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 22091; 703-620-9840; nctm.org website

Required Course Packet Readings:


Additional Resources:


VI. Course Requirements, Assignments, & Evaluation Criteria

The assignments across the semesters are intended to develop skills in mathematics curriculum analysis and evaluation. Students conduct in-depth study of mathematics curriculum materials, investigate NSF-funded mathematics curriculum projects, examine research on mathematics curriculum projects, and present an evaluation of their findings. All assignments are to be completed on time so that class members might benefit from the expertise and contributions of their colleagues.

Successful completion of this course requires the following:

1. **A commitment to participation in class discussions and activities.**
   
   The quality of this course depends heavily and primarily on the regular attendance and participation of all involved. Participation will include taking part in discussions informed by critical reading and thinking, leading discussions about selected mathematics problems, and sharing with the class the products of various writing, reflection, lesson planning, and field experience assignments. The expectations, demands and workload of this course are professional and high.

2. **A commitment to reading reflectively and critically the assigned readings.**
   
   The readings will be used to provide a framework and coherent theme to the course content. They have been selected to introduce themes in curricular development as well as research and critical commentary on mathematics curriculum.

3. **Mathematics Content Review and Group Presentation (20%)**
   
   Conduct a review of five school mathematics curriculum projects. Prepare an activity for the class related to the content area as well as a review of research literature related to the mathematical content. The review should be 8-10 pages (double-spaced typed) in length.

4. **NSF–Funded Curriculum Review and Presentation (35%)**
   
   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 that has been published 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 (approx. 10-15 pages in length). Use Powerpoint and other forms of technology to prepare and present your findings during a class session. (Written Review (25%) + Presentation (10%) = 35%)

5. **Curriculum Design Project (35%)**

Design a small mathematics curriculum project (approximately 2-4 lessons). There are some common characteristics of high quality curriculum materials in mathematics. The purpose of this assignment is to integrate your knowledge of these design characteristics into the creation of a curriculum development project. Set goals for your project. Identify your audience and their needs. Select the critical/essential understandings of the audience for your project. Curriculum materials are designed with a wide variety of goals and content. The purpose of this assignment is to develop a small curriculum design project for an audience of learners. For example, the project could be to design curriculum or activities for teachers using web-based tools, for students using manipulatives or for classroom instruction.

6. **Discussion Record (10%)**

During each class session, students participate in discussions of readings and student presentations and provide written feedback to class members. A discussion record is maintained during each of these class sessions documenting the participation of each class member. Students are graded on their contributions to these discussions and on the written evaluation feedback for class members.

**Evaluation Criteria**
Graduate Grading Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>93%-100%</td>
</tr>
<tr>
<td>A-</td>
<td>90%-92%</td>
</tr>
<tr>
<td>B+</td>
<td>87%-89%</td>
</tr>
<tr>
<td>B</td>
<td>80%-86%</td>
</tr>
<tr>
<td>C</td>
<td>70%-79%</td>
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<tr>
<td>F</td>
<td>Below 70%</td>
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**VII. UNIVERSITY POLICIES**

The university has a policy that requests students to turn off pagers and cell phones before class begins.

**HONOR CODE**

To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of George Mason University and with the desire for greater academic and personal achievement, George Mason University has set forth a code of honor that includes policies on cheating and attempted cheating, plagiarism, lying and stealing. Detailed information on these policies is available in the GMU Student Handbook, the University Catalog, of the GMU website (www.gmu.edu).

**INDIVIDUALS WITH DISABILITIES POLICY**

The university is committed to complying with the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 by providing reasonable accommodations for applicants for admission, students, applicants for employment, employees, and visitors who are disabled. Applicants for admission and students requiring specific accommodations for a disability should contact the Disability Resource Center at 993-2474, or the University Equity Office at 993-8730.

**ATTENDANCE POLICY**

Students are expected to attend the class periods of the courses for which they register. Although absence alone is not a reason for lowering a grade, students are not relieved of the obligation to fulfill course assignments, including those that can only be fulfilled in class. Students who fail to participate (because of absences) in a course in which participation is a factor in evaluation, or students who miss an exam without an excuse, may be penalized according to the weighted value of the missed work as stated in the course syllabus (GMU University Catalog, pg. 32).
### COURSE SCHEDULE

Note: The course schedule is subject to revision at the discretion of the instructor. Revisions will be announced in class.

<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Topic and Reading</th>
<th>Mathematics Topic</th>
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</table>
| 1     | Sept. 17 | Standards for School Mathematics
NSF Sponsored Curriculum Materials (online resource) |                              |
School Mathematics Curricula: Recommendations and Issues (Senk Ch#1)
Ferrini-Mundy (2000) | Numbers and Numeration |
| 3     | Nov. 19  | Elementary Grades Curriculum Projects
(Senk Ch#2-4)
| 4     | Dec. 17  | Elementary Grades Curriculum Projects
(Senk Ch#5-7)
| 6     | Feb. 18  | Middle Grades Curriculum Projects (Senk Ch#8-9)
| 7     | Mar. 18  | Middle Grades Curriculum Projects (Senk Ch#10-12)
Waits, B. K., & Demana, F. (2000). | Statistics and Data Analysis |
| 8     | April 15 | High School Curriculum Projects (Senk Ch#13, 18, 19)                            | Algebra: Patterns and Relationships |
| 9     | May 13 (2nd Sat.) | Curriculum Projects Presentations |                              |