

**CENTRAL CONNECTICUT STATE UNIVERSITY**  
**Elementary Mathematics Methods**  
**Math412**

**Instructor:** JoAnne Harper

**Office Hours:** \_\_\_\_\_

**Section:** 1

**Credits:** 3 - Undergraduate

**Term:** Fall, 2010

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**Location:** MS. – Room214

**Catalog Description:**

Concepts underlying contemporary mathematics curriculum for Elementary grades. Developmentally appropriate methods for developing, through problem solving, concepts and the meaning of operations and procedures in arithmetic.

**Prerequisite:**

Math 213 (C- or higher) and admission to the Professional Program  
Structure in Mathematics II: Probability and Geometry

**Students for Who Course is Intended:**

Students planning to be certified in Elementary Education

**Text:**

Burns, M., Math: Facing an American Phobia, Sausalito, CAL Math Solutions Publications, 1998

**Supplies:** Index Cards (50) (lined or unlined – any size)  
Manila folders (25)  
Fine Tip Markers (red and black)  
Stapler (if available)

Poster Board or Easel paper or Chart Paper (1)

Other ‘Make and Take’ Materials as needed  
In course

**Overview:** This course examines the methods and procedures in teaching mathematics at the elementary level. It is designed to prepare pre-service elementary teachers to become independent professionals who can effectively arrange learning environments, plan educational activities and assess learning outcomes. The course content will be presented using practices that are aligned with the National Council of Teachers of Mathematics Standards. Teacher candidates will have an opportunity to apply the content and pedagogy from this course and other methods courses (EDT 415, RDG 412, SCI 412, FA 412) by taking part in a field experience practicum during the semester.

In addition to the NCTM Standards and the CT Math Content Standards, INTASC Standards that will receive special emphasis in this course are the following:

**Principle #1:** The Teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) s/he teaches and can create learning experiences that make these aspects of subject matter meaningful for students.

**Principle #9:** The teacher is a reflective practitioner who continually evaluates the effects of his/her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out opportunities to grow professionally.

### **Course Objectives:**

- A. To examine the content and presentation of mathematics currently being taught in elementary schools
- B. To introduce students to curricular reforms and current literature in the area of teaching mathematics in the elementary schools
- C. To encourage students to examine their professional background in mathematics with a goal of self improvement
- D. To anticipate current educational trends with a view to the future needs of all educated people in the area of mathematics

### **University Policy:**

- 1. If you need course adaptations or accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible.
- 2. In the event of a weather emergency which requires the cancellation of classes, listen to WTIC (1080AM) or call (860) 832-3333.
- 3. The last day to drop a course is \_\_\_\_\_. Drop forms are available in the Enrollment Center, Willard Hall. Cessation of attendance, notice to the instructor, or telephone calls to the Enrollment Center are not considered an official notice of a student's intention to drop the course.
- 4. Academic integrity is the responsibility a student assumes for honestly representing all academic work. Cheating or plagiarism on any assignment will result in a grade of zero.

**Attendance:**

You are expected to attend **all** class meetings and participate in class workshops and discussions. All reading assignments should be completed prior to the appropriate class session. Please bring your textbook on the agreed dates, your journal only when it is due and additional materials when they are assigned. In the unlikely event that you are unable to attend a class session, **please call my home to leave a message on my answering machine explaining your absence or please e-mail me explaining your absence.**

**Assignments:**

All assignments (except your Midterm Exam and your lesson presentation) will be accepted on the next session after the due date with no late penalty. (Reference Time Line Schedule for semester).

## Course Requirements:

- 1) Midterm: This exam will test the understanding of methods and mathematical concepts presented in this course. (Review sheet will be provided). The exam will consist of narrative and listing questions.

20% of grade

2A) Article Summary with Reflection: An article summary with reflection is required (2 pages, typed, double-spaced as a minimum). *Teaching Children Mathematics* (TCM) and *Mathematics in the Middle School* (MTMS) are good sources to use for this assignment.

You are to read, summarize and reflect on your background in elementary teaching of mathematics. Consider your own strengths and weaknesses in the math classroom. Select an article that discusses a method or technique that would be beneficial to you as a future mathematics teacher. Summarize the important information; then reflect and critique the article in light of your learning experiences thus far. Your critique should relate to learning theories, principles from class discussions, or readings from all method courses. **Be sure to support your opinions with cited sources (NCTM Standards, texts, your own past experiences, or other research) at least 4 times within the summary.** The summary and reflection lengths should be equivalent. Please include a copy of the article attached to your Summary. (Scoring rubric, Attachment A)

**OR**

2B) Internet Search: You are to search on the internet for a math education resource what would be helpful to you in your future math classroom. This resource could be a lesson plan, math activity, software, or an article that relates to this methods course. Briefly summarize what you have found in your search and include a critique similar to the article summary. **Be sure to support your opinions with cited sources like above.** Please submit a copy of the first few pages of the web article and the web address on the cover page of your article. If you choose this option the same rubric will be used to evaluate it. Proper spelling and grammar will be evaluated. (Scoring rubric, Attachment A)

20% of grade

**3) Class Journal:** Once a week for 7 weeks, you will be given an elementary education mathematical issue. Your response should be 1 typed page. **Please date each entry and write the prompt at the top of the page.** This is your opportunity to reflect and give your written opinion of a math issue. The work that you turn in is a reflection of your professional opinion. Journals will be submitted on the due date (once at the end of receiving all entries). (Attachment B). Be sure that each entry is a full page (minimum requirement). **Use past experience and texts to support your opinions.**

20% of grade

**4) Math Lesson Presentation:** You are required to teach one lesson in your field experience math classroom. The lesson that you prepare and present to the children will be taught, also, in part to your classmates in Math #412. A 10 minute presentation will include 1) A signed Planning Sheet from your field experience teacher (attached), 2) A detailed written Math Lesson Plan and Reflection of your experience with children, 3) A piece of math children's literature to match your chosen math topic, 4) A tailor-made worksheet, and 5) Copies of your lesson plan for each classmate on the day that you present.

30% of grade

**5) Math Box:** Since manipulatives are essential for each child in your math classroom, you are asked to accumulate homemade supplies in a storage container. Every 'math box' will be different, but supplies may include scissors, counters of any sort (like candy), stickers, string, dice, playing cards, flashcards, games, and graph paper.

10% of grade

Attachment A: Scoring Rubric for Article Summaries and Internet Search

<b>Exemplary Assignment:</b>	<b>Rating 5</b>
Content: Gives a complete summary Highlights main ideas Identifies important issues Refers to examples Critique is well thought out, clear, coherent, unambiguous Ideas are supported with sources (NCTM, learning theory, text, etc.)	
Writing Style: Assignment is free from grammatical and spelling errors Follows suggested format Communicates effectively with intended audience	

<b>Competent Assignment:</b>	<b>Rating 4</b>
Content: Gives a fairly complete summary Includes many main ideas Identifies most of the important issues May refer to an example Critique is reasonable clear and coherent Some ideas are supported by sources (NCTM, learning theory, text)	
Writing Style: Assignment is free from grammatical and spelling errors Attempts to follow suggested format Communicates effectively with intended audience	

<b>Satisfactory Assignment</b>	<b>Rating 3</b>
Content: Partial summary Shows partial understanding of main ideas Identifies only a few of the important issues May include an example Critique is somewhat coherent Presents a weak argument Provides support for ideas, but does not use sources	
Writing Style: Assignment has a few grammatical and/or spelling errors Makes no attempt to follow format Communication is slightly muddled	

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**Attachment B: Scoring Rubric for Math Journals**

Name: \_\_\_\_\_

<b>INDICATOR</b>	<b>POSSIBLE POINTS</b>	<b>POINTS EARNED</b>
Journal entries are complete with restatement sentence to sum up. All entries are present. (Minimum each 1 double spaced, typed page)	60	_____
Each entry shows thorough explanations with specific examples from past experiences or support from research.	20	_____
Writing is clear, easy to understand, and free of grammatical errors and spelling errors.	20	_____
	_____	
Total:	100	

(Revised Spring, 2007)

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### **Attachment C: Lesson Presentation Criteria**

Grade is determined on submission of a detailed lesson plan of 50 to 60 minute math lesson with children (50%) and class presentation of part of lesson plan (10 minute) (50%).

Lesson plan and presentation should include evidence of:

- **HOOK** – Piece of children’s literature related to lesson (only in lesson plan because of time constraints)
- **VOCABULARY** – (Minimum 5 words displayed for student and referred to in lesson presentation)
- **MANIPULATIVES** (Concretes for each student or set of partners to touch)
- **INVOLVEMENT OF STUDENTS WITH EACH OTHER AND TEACHER**
- **MODELING** (showing examples with role-playing or overhead or chalkboard or posters throughout lesson presentation)
- **PROVIDING CLEAR DIRECTIONS TO STUDENT ACTIVITY**
- **QUESTIONING** (Asking ‘Why’ or ‘How’ questions)
- **TAILOR-MADE WORKSHEET** (that children use during presentation to create a product)
- **REFLECTION** (Minimum of 1 page of self-assessment of both positive and improvement aspects of math lesson)
- **ENTHUSIASM** by teacher during presentation .
- **PRAISE AND ENCOURAGEMENT** by teacher
- **EVIDENCE OF LEVELS OF LEARNING** (Concrete to pictorial to abstract during presentation)
- **SIGNALS OR CUES** to focus or refocus by teacher during presentation)
- **CLOSURE** (only in lesson plan because of time constraints)

A copy of your complete lesson plan will be provided the day that you present to each of your classmates.

Your Math Buddy will assist you with distributing materials before your presentation and keeping time to guide you through your presentation.

(Revised 07)

PLANNING SHEET  
FOR  
MATHEMATICS LESSON  
EMM 412

My CCSU student has met with me regarding the mathematics lesson that will be presented in the classroom. I have approved the lesson.

CCSU Student's Name: \_\_\_\_\_

Topic: \_\_\_\_\_

CMT Strand(s) or NCTM Standard(s)

\_\_\_\_\_

Classroom Teacher's Signature: \_\_\_\_\_

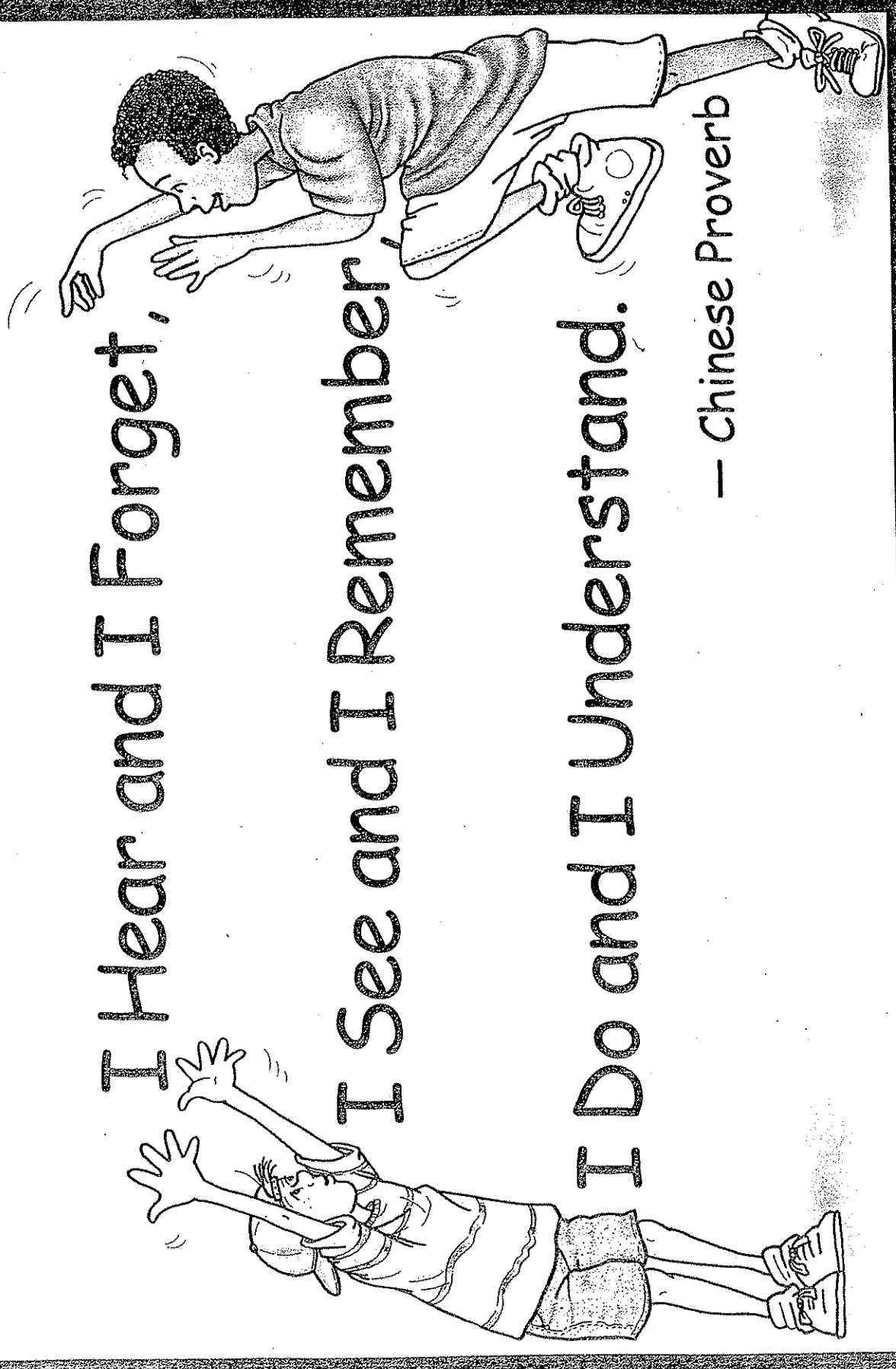
Date: \_\_\_\_\_

I Hear and I Forget.

I See and I Remember.

I Do and I Understand.

— Chinese Proverb



ACTIVITY \_\_\_\_\_  
\_\_\_\_\_

GRADE LEVEL(S) \_\_\_\_\_

MATERIALS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

VOCABULARY  
WORDS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

CONTENT  
STANDARD(S) \_\_\_\_\_  
\_\_\_\_\_

DIRECTIONS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**TENTATIVE SCHEDULE**

**ELEMENTARY MATHEMATICAL METHODS**

MATH 412		FALL 2010
08/31	Overview of Course	
09/02	Learning Theory Math Phobia	Burns 1
09/07	NCTM Standards	Folders
09/09	Estimation	Handouts and Activities
09/14	Pre-Number Concepts (Number Readiness)	Burns 3
09/16	Place Value	Burns 6
09/21	Place Value (Cont.), Basic Facts and Calculators	Burns 9
09/23	Add and Subtract Stories	Handout
09/28	Add and Subtract Stories (cont.)	Handout
09/30	Multiplication Stories And	Handout
	<b>ARTICLE or INTERNET SEARCH due</b>	
10/05	Multiplication Stories (cont.)	Handout
10/07	Division Stories	Handout
10/12	'Make and Take' Workshop	'Doing' Day
10/14	Division Stories ( cont.)	Activities and Class Notes

10/19	Graphing, Statistics and Probabilities	Activities and Class Notes
10/21	'Family Math' Activities	Activities and Class Notes
10/26	Catch Up and Review for Midterm	
10/28	<b>MIDTERM Exam</b>	
11/02	Fractions	Burns 4 & 10
11/04	Fractions	Activities and Class Notes
11/09	Decimals and Percents	Activities and Class Notes
	<b>PLANNING SHEET</b> due – (signature of teacher for lesson presentation) And <b>JOURNAL</b> due	
11/11	Measurement	Activities Burns 12
11/16	Measurement (Cont.)	Activities Class Notes
11/23	Geometry <b>MATH BOX DUE</b>	Activities and Class Notes
	<b>THANKSGIVING</b> recess	
11/30	<b>LESSON PRESENTATIONS</b>	Sign-up Sheet
12/02	<b>LESSON PRESENTATIONS</b>	Sign Up Sheet
12/07	<b>LESSON RESENTATIONS</b>	Sign-Up Sheet

12/09

**LESSON PRESENTATIONS**

**Sign-Up Sheet**

**MATH TOPIC 'SUSTAINABILITY' PLAN DUE**

12/14

**'MAKE AND TAKE' WORKSHOP  
IN LIEU OF 'FINAL EXAM'**