



Course Syllabus

COURSE NUMBER: MTHC 5340.W1	COURSE TITLE Topics in mathematics education: Technology in the math classroom	TERM: Summer 2006
SITE: Online	INSTRUCTOR CONTACT INFORMATION: Cynthia Aossey aossey@webster.edu (502)227-8199	CREDIT HOURS: 3

1. COURSE DESCRIPTION:

THIS COURSE IS OFFERED ONLINE. IT IS A HAND-ON, PROJECT-BASED COURSE DESIGNED TO HELP EDUCATORS USE TECHNOLOGY CREATIVELY AND EFFECTIVELY IN SUPPORT OF CURRICULUM IN MIDDLE AND SECONDARY MATHEMATICS CLASSROOMS. EMPHASIS IS ON LEARNING TO USE THE INTERNET, SOFTWARE AND CALCULATORS. STUDENT'S WORK WILL REFLECT THE GRADE LEVEL THEY TEACH.

2. LEARNING OUTCOMES:

Course Outcomes	Math Program Goals	SoE Goals, SoE Dispositions, and MoSTEP/Prof Standards Addressed
Describe terms, concepts and trends in the use of technology with middle, secondary and special education students	Math Program goal (3) to help our students to become better teachers by our modeling effective teaching techniques.	MO-STEP 11.1, SoE Goals 2.2.3, 4.4.4
Select and evaluate web sites to determine appropriate use in the classroom	Math Program goal (2) to increase problem solving skill, (3) to help our students to become better teachers by our modeling effective teaching techniques.	MO-STEP 1.2, 4.1, 4.2, 5.1, 7.4, 9.2, 11.1, 11.2, 11.3, 11.5, SoE Goals 2.2.3
Plan for the use of technology as an integrated part of the curriculum.	Math Program goal (3) to help our students to become better teachers by our modeling effective teaching techniques.	MO-STEP 1.2, 4.1, 4.2, 5.1, 5.2, 7.4, 11.1, 11.2, 11.3, SoE Goals 2.2.3
Use spreadsheets, word processing (with equation editor) with students and as teacher utilities.	Math Program goal (2) to increase problem solving skill, (3) to help our students to become better teachers by our modeling effective teaching techniques.	MO-STEP 1.2, 11.5, SoE Goals 2.2.3
Explore resources available to assist students with special needs.	Math Program goal (3) to help our students to become better teachers by our modeling effective teaching techniques.	MO-STEP 1.2, 3.3, SoE 2.2, 4.4
Use the internet for research and email.	Math Program goal (2) to increase problem solving skill, (3) to help our students to	MO-STEP 3.3, 9.2, SoE Goals 2.3, 3.1, SoE Dispositions

	become better teachers by our modeling effective teaching techniques.	1.1.4
Demonstrate competency with a variety of mathematical software and hardware	Math Program goal (2) to increase problem solving skill, (3) to help our students to become better teachers by our modeling effective teaching techniques.	MO-STEP 1.2, 4.1, 4.2, 5.1, 5.2, 11.1, SoE Goals 2.2.3,4.4.3, 4.4.4
Reflect on uses of technology in the math classroom through personal logs, assignments and online discussion boards.	Math Program goal (2) to increase problem solving skill, (3) to help our students to become better teachers by our modeling effective teaching techniques.	MO-STEP 9.2, 11.6, SoE Goals 2.2.3, 3.3.1, 4.4.4, SoE Dispositions 1.1.4
Participate in online discussion regarding how technology has affected and will continue to affect course content and can be used in instruction.	Math Program goal (2) to increase problem solving skill, (3) to help our students to become better teachers by our modeling effective teaching techniques.	MO-STEP 9.2, 11.6, SoE Goals 2.2.3, 3.3.1, 3.3.2, SoE Dispositions 1.1.4, 2.2.1, 2.2.4

3. ACTIVITIES:

This course is taught online and a large part of it is individual work. It involves reading, researching, experimenting and writing. There are multiple small units worth a varying number of points. There will be units on the web, calculators and accessories, math specific software, math classroom software, spread sheets, professional videos, etc. Depending on the unit, you will be asked to write a short report, plan a classroom activity, do an assignment to demonstrate proficiency and/or participate in a discussion group. For each unit you will also be required to write a brief learning log indicating a day by day record of how much time was spent on that project and what was accomplished. The log should be informal as if you were telling a friend how you spent your time. It can include positive and negative comments as to the usefulness of the content and organization of the assignment. There are no exams or quizzes.

With few exceptions, the units may be worked in any order. Some units require special materials such as calculators. Information as to where to access these materials will be given online and will typically be available through the Webster library on the St. Louis campus. Except for some required discussion and a required introductory unit, students have the freedom to choose which units to work. Please note that this course can be completed without access to the St. Louis campus library by an appropriate selection of units. Most units can be completed within a few days; however, the two required discussion units will be spread out over several weeks. Be sure to start on these within the first week.

4. RESOURCES:

No texts are needed for this course. Most reading material will be available through WebCT or the internet. For a few specific units, some required hardware or materials will be made available on the St. Louis campus. However, this course can be completed without access to the St. Louis campus library by an appropriate selection of units. Students are expected to use Microsoft Office and can purchase it through Webster at a reduced cost.

5. EVALUATION:

Points for each activity will vary from 5 to 20 points. If you do part of a unit you will earn a portion of the points. This course is offered on a pass/fail basis. To pass you must have earned at least 170 points, including the minimum number of points required in the 2 discussion units. It is important in an online course to pace yourself and not turn in all your work in the last week or two. Therefore I require that at least 115 points be submitted by the end of the fifth week. In order that I have time to grade all of the work and respond to any problems, I require that all 170 points be submitted by the Tuesday of the final week. I encourage you to keep a steady pace of turning in about 25-35 points of work each week. I will attempt to get the work graded quickly.

6. GRADING SCALE:

This course is offered on a pass/fail basis. To pass you must have earned at least 170 points, including the minimum number of points required in the 2 discussion units.

Note: All projects and papers are to be submitted through WebCT. All grades and grading comments will be returned through WebCT.

This is an 8 week 3 credit hour online course. You can visit <http://www.webster.edu/online/> to learn about Webster University Online Programs. Students are expected to visit this class within the first 3 days of the term. The "Get Started" option under the "Students" tab has information about obtaining your ID, logging into a WebCT class and much more. If you have difficulty logging into the class, please contact me by email or phone for assistance within the first 3 days of class.

This syllabus is subject to change at the discretion of the instructor.

ACADEMIC HONESTY POLICY

Students at Webster University are expected to practice academic honesty.

Avoiding Plagiarism

Plagiarism is intentionally claiming that another person's work is his/her own or implying that another person's work is his/her own (through inadequate or inaccurate citations of reference material.)

Students:

- Should not copy whole portions of text from another source as a major component of papers or projects.
- Should identify the title, author, page number/webpage address, and publication date of works when directly quoting small portions of texts, articles, interviews, or websites.
- Should appropriately identify the source of information when paraphrasing (restating) ideas from texts, interviews, articles, or websites.
- Should follow the guidelines of the American Psychological Association Style Guide when referencing all research sources.

For further information about the consequences of academic dishonesty please consult the Webster University Student Handbook.

ACCESSIBILITY/ACCOMMODATIONS POLICY

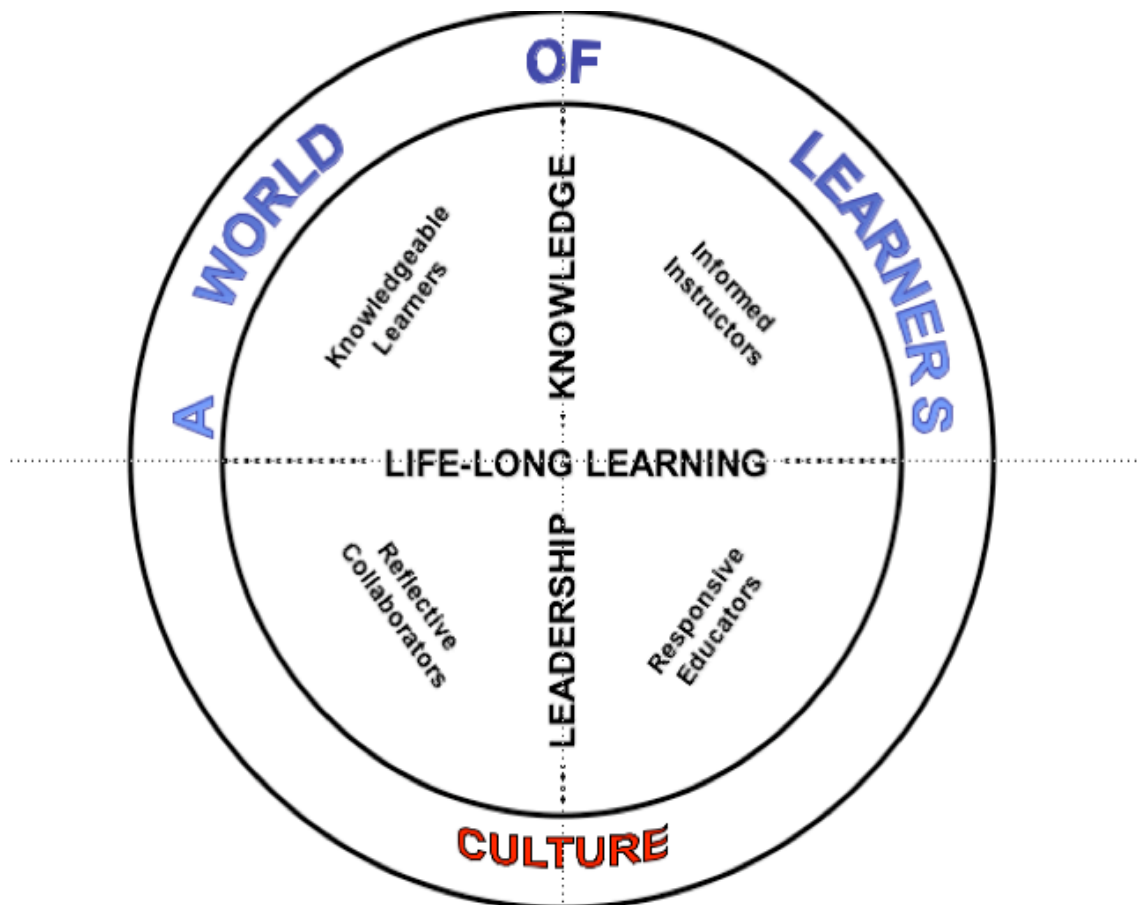
If you have a disability that may have some impact on your work in this class and for which you may require accommodations contact the Director of the Academic Resource Center, Dr. Pat McLeese, at (314) 968-7495.

**Webster University
School of Education**

Vision: “. . . We all must work to make this world worthy of its children.” (Casals, 1970)

Mission: The School of Education at Webster University provides its students with the knowledge, experiences, and practical tools that help them guide both themselves and others toward lifelong learning. The School of Education is a community of educator-scholars who apply critical reflections and creative energies to enhance learning in schools and other educational settings. The faculty strives to support this community by modeling effective teaching practices based on sound theory and research. Personalized approaches create a challenging, yet supportive environment that permits the risk-taking necessary for learning and growth. The School of Education encourages its faculty and students to work actively toward this end, keeping in mind that action must be rooted in visionary, yet realistic, thinking. This thought and action process underscores the development of an inner-directed self-understanding, an outer-directed global perspective, and an appreciation of human diversity that arises from both.

Theme: Developing a world of learners through knowledge, leadership, and life-long learning.



The universal mandala (a circle with intersecting vertical and horizontal lines) graphically represents the conceptual framework of the School of Education. The outer circle provides the framework for a “world of learners” in cultural settings. The two axes represent the theme components of knowledge, leadership, and life-long learning. These lines are broken to emphasize the fluid relationship of the goals and integrated concepts. Each quadrant represents one of the school’s four goals for its candidates: to develop knowledgeable learners, informed instructors, reflective collaborators, and responsive educators.

School of Education Goals

1. Education candidates will demonstrate knowledge of the subject matter, knowledge of the learner, and knowledge of pedagogy based on inquiry and scholarship.

The knowledgeable learner:

- 1.1 knows content that supports conceptual understanding;
 - 1.2 applies tools of inquiry to construct meaningful learning experiences;
 - 1.3 identifies developmental factors in student learning; and
 - 1.4 understands theoretical principles of effective instruction to plan learning experiences.
2. Education candidates will incorporate multiple assessment and instructional strategies to support effective educational practices based on research and theory.

The informed instructor:

- 2.1 designs curriculum based on students' prior knowledge, learning styles, strengths, and needs;
 - 2.2 understands and uses a range of instructional strategies;
 - 2.3 uses a variety of communication modes, media, and technology to support student learning; and
 - 2.4 employs a variety of formal and informal assessments to monitor learning and modify instruction.
3. Education candidates will reflect on the roles educators take as leaders of change through collaboration with colleagues, students, and families in schools and communities.

The reflective collaborator:

- 3.1 values and integrates reflection to grow as a professional;
 - 3.2 promotes communication and collaboration with colleagues, families, and community leaders;
 - 3.3 seeks relationships with families and students to support student learning; and
 - 3.4 initiates change that benefits students and their families.
4. Education candidates will demonstrate respect for diversity through responsive teaching and learning that values individual differences.

The responsive educator:

- 4.1 understands and responds appropriately to issues of diversity
- 4.2 acknowledges social and cultural contexts to create effective teaching and learning environments;
- 4.3 adapts instruction to the learner's knowledge, ability, and background experience; and
- 4.4 identifies resources for specialized services when needed.

School of Education Dispositions

NCATE defines dispositions as "the values, commitments and professional ethics that influence behaviors toward students, families, colleagues, and communities and affect student learning, motivation, and development as well as the educator's own professional growth. " (Professional Standards, p. 53) There is significant value in focusing attention on qualities that make an effective teacher.

1. Understands and Respects Self
 - 1.1 Understands and respects that s (he) may be different from others
 - 1.2 Embraces an openness to change (adaptability, flexibility)
 - 1.3 Exhibits curiosity
 - 1.4 Engages in reflection
2. Understands and Respects Others
 - 2.1 Understands, respects, and responds appropriately to diversity in a variety of settings
 - 2.2 Exhibits empathy
 - 2.3 Commits to fairness and honesty
 - 2.4 Listens respectfully to other points of view

3. Understands and Respects Professional Communities
 - 3.1 Commits to professional behavior in university and school cultures
 - 3.2 Practices informed decision-making in university and school cultures
 - 3.3 Communicates and collaborates in university and school cultures
 - 3.4 Accepts academic rigor (willingness to work/ high expectations)
 - 3.5 Affects change with courage and confidence

VII. MOSTEP STANDARDS

Standard 1: The entry-level teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) within the context of a global society and creates learning experiences that make these aspects of subject matter meaningful for students

The entry-level teacher:

- 1.1 knows the discipline;
- 1.2 presents the subject matter in multiple ways;
- 1.3 uses students' prior knowledge;
- 1.4 engages students in the methods of inquiry used in the discipline;
- 1.5 creates interdisciplinary learning.

Standard 2: The entry level teacher understands how students learn and develop, and provides learning opportunities that support the intellectual, social and personal development of all students

The entry-level teacher:

- 2.1 knows and identifies child/adolescent development;
- 2.2 strengthens prior knowledge with new ideas;
- 2.3 encourages student responsibility;
- 2.4 knows theories of learning

Standard 3: The entry-level teacher understands how students differ in their approaches to learning and creates instructional opportunities that are adapted to diverse learners.

The entry-level teacher:

- 3.1 identifies prior experience, learning styles and needs;
- 3.2 designs and implements individualized instruction based on prior experience, learning styles, strengths and needs;
- 3.3 knows when and how to access specialized services to meet students' needs;
- 3.4 connects instruction to students, prior experience and family, culture and community.

Standard 4: The entry-level teacher recognizes the importance of long-range planning and curriculum development and develops, implements, and evaluates curriculum based upon student, district, and state performance standards.

The entry-level teacher:

- 4.1 selects and creates learning experiences that are appropriate for curriculum goals, relevant to learners, and based upon principles of effective instruction
- 4.2 create lessons and activities that recognize individual needs of diverse learners and variations in learning styles and performance;
- 4.3 Evaluates plans relative to long and short-term goals and adjusts them to meet student needs and to enhance learning.

Standard 5: The entry-level teacher uses a variety of instructional strategies to encourage students' development of critical thinking, problem solving, and performance skills.

The entry-level teacher:

- 5.1 selects alternative teaching strategies, materials, and technology to achieve multiple instructional purposes and to meet student needs.
- 5.2 engages students in active learning that promotes the development of critical thinking, problem solving, and performance capabilities.

Standard 6: The entry-level teacher uses an understanding of individual and group motivation and behavior to create a learning environment that encourages positive social interaction, active engagement in learning and self-motivation.

The entry-level teacher:

- 6.1 knows motivation theories and behavior management strategies and techniques
- 6.2 manages time, space, transitions and activities effectively;
- 6.3 engages students in decision making,

Standard 7: The entry-level teacher models effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.

The entry-level teacher:

- 7.1 models effective verbal/non verbal communication skills;
- 7.2 demonstrates sensitivity to cultural, gender, intellectual, and physical ability differences in classroom communication and in responses to students' communication
- 7.3 supports and expands learner expression in speaking, writing, listening, and other media;
- 7.4 uses a variety of media communication tools

Standard 8: The entry-level teacher understands and uses formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social and physical development of the learner.

The entry-level teacher

- 8.1 employs a variety of formal and informal assessment techniques to enhance and monitor his or her own knowledge of learning, to evaluate student progress and performance, and to modify instructional approaches and learning strategies.
- 8.2 uses assessment strategies to involve learners in self-assessment activities, to help them become aware of their learning behaviors, strengths, needs, and progress, and to encourage them to set personal goals for learning;
- 8.3 evaluates the effect of class activities on both individuals and the class as a whole, collecting information through observation of classroom interactions, questioning, and analysis of student work;
- 8.4 maintains useful records of student work and performances and can communicate student progress knowledgeably and responsibly, based on appropriate indicators, to students, parents and other colleagues.

Standard 9: The entry-level teacher is a reflective practitioner who continually assesses the effects of choice and actions on others. This reflective practitioner actively seeks out opportunities to grow professionally and utilize the assessment and professional growth to generate more learning for more students.

The entry-level teacher:

- 9.1 applies a variety of self-assessment and problem-solving strategies for reflecting on practice, its influences on students' growth and learning, and the complex interactions between them
- 9.2 uses recourses available for professional development
- 9.3 practices the profession's ethical standards

Standard 10: the entry-level teacher fosters relationships with school colleagues, parents and educational partners in the larger community to support student learning and well being.

The entry-level teacher:

- 10.1 participates in collegial activities designed to make the entire school a productive learning environment;
- 10.2 talks with and listens to students, is sensitive and responsive to signs of distress, and seeks appropriate help as needed to solve students problems;
- 10.3 seeks opportunities to develop relationship with the parents and guardians of students, and seeks to develop cooperative partnerships in support of student learning and well being;
- 10.4 Identifies and uses the appropriate school personnel and community sources to help students reach their potential;

Standard 11: Technology in Teaching and Learning: The pre-service teacher understands the theory and application of technology in educational settings and has adequate technological skills to create meaningful learning opportunities for all students.

The entry-level teacher:

- 11.1 Demonstrates an understanding of technology operations and concepts.

- 11.2 Plans and designs effective learning environments and experiences supported by informational and instructional technology.
- 11.3 Implements curriculum plans that include methods and strategies for applying informational and instructional technology to maximize student learning.
- 11.4 Applies technology to facilitate a variety of effective assessment and evaluation strategies.
- 11.5 Uses technology to enhance personal productivity and professional practice.
- 11.6 Demonstrates an understand of the social, ethical, legal, and human issues surrounding the use of technology in PK-12 schools and applies that understanding in practice.