

The University of Tennessee at Martin
Department of Educational Studies
Course Syllabus

- I. Course Number and Title
Teacher Education 340
Applied Mathematics and Science
Required Texts: C. Alan Riedesel, James E. Swartz Essentials of Elementary Mathematics, Ashlock Robert B. Error Patterns in Computation, Marvin Tolman & Garry Hardy Discovering Elementary Science: Method, Content, and Problem Solving Activities
Articles on reserve in the Learning Resource Center Gooch Hall 216
- II. Credit Hours/ Prerequisites
Admission to Teacher Education
Teacher Education 302
4 semester hours

Faculty frequently teaching this course:

Dr. Patricia Hewitt
Gooch 240E
#7213
phewitt@utm.edu

Dr. James Petty
Gooch 240
#7496
jpetty@utm.edu

- III. Catalog Description
Strategies for teaching mathematics and science in the elementary school. Lesson and unit planning, simulated and direct teaching experiences. Includes small group teaching in the public schools.
- IV. Rationale
As we move into the twenty-first century the need for a strong background in mathematics and science continues to be a vital and important concern throughout the world. Research has shown that a great deal of one's future interest and success in the areas of science and mathematics is rooted in whether a person has had a positive foundation laid at the elementary school level. Therefore, it is critical that future teacher be given the necessary knowledge, and skills that would include current trends and methods in the teaching of mathematics and science, to successfully prepare our children for the "information age" of our technological society.
- V. Teacher Education Model
The UTM Teacher Education Program is designed to develop teacher who become facilitators of learning by their participation in activities and methods designed to encourage active learning. Students become immersed in best practice as a way to strengthen skills and professionalism in teaching. The UTM Teacher Education Program is based on a conceptual framework that is derived from current research and best

practice. The following components represent the knowledge and skills a facilitator of learning is expected to develop.

- A. Knowledge, Skills, and Applications
- B. Reflective Practice
- C. Professional and Ethical Behavior

VI. Goals and Objectives

General Goals: Cognitive

Each Student Will:

1. develop acceptable expectations and goals for students at the appropriate developmental levels/grade (Conceptual Framework: A. B.) (Professional Matrix: II. A, B, C; V. B,C) (Elementary Education Matrix: I. G; II. A) (2, 3, 21)
2. identify both the importance and relationship of each of the two fields of study, math and science, and their use in daily lives (Conceptual Framework: A. B.) (Professional Matrix: II. H; III. D, G; V. C) (Elementary Ed Matrix: II. B; IV. B; VII. C, E) (6, 33)
3. acquire appropriate skills to develop plans and activities for the teaching of math and science. (Conceptual Framework: A.B.) (Professional Matrix: II. B, C, E, H; IV. A, B; V. B)(Elementary Ed Matrix: II. A, C; IV. G, H, I; VII. A, B, F) (10, 22, 28, 29, 30)
4. acquire effective teaching skills based on research of effective teaching methods in math and science. (Conceptual Framework: A, B) (Professional Matrix: III. D; I. D; V. C)(Elementary Ed Matrix: II. A, B, C;) (10, 16, 23, 24, 29)
5. demonstrate and model effective oral and written communication skills. (Conceptual Framework: A, B, C)(Professional Matrix: I. A, B)(Elementary Ed Matrix: III.E)(12, 35)
6. utilize process skills in planning activities for math and science (Conceptual Framework: A,)(Professional Matrix: A, B, C)(8, 27, 29, 31)
7. demonstrate knowledge of current trends, standards, and technology utilized in teaching math and science. (Conceptual Framework:A,B.)(Professional Matrix: III. G, A, B)(Elementary Ed Matrix: VII. C, G)(16, 28, 34)
8. demonstrate knowledge of effective strategies to utilized in planning. (Conceptual Framework: A,B)(Professional Matrix: II. F, L, M; V.B)(Elementary Ed Matrix: II. A, B, C; IV. F, G, H, I; VII. B, E, F, G, H)(2, 3, 5, 8, 9, 10, 11, 15)
9. plan and be able to carry out meaningful and varied classroom activities that are relevant to the teaching of math and science in a culturally diverse classroom setting. (Conceptual Framework: A,B,)(Professional Matrix: II. E, F, H)(3, 4, 5, 16, 19, 21, 23, 24, 37)

10. demonstrate the ability to identify, construct, and effectively use hands-on activities in planning units or daily lesson plans. (Conceptual Framework: A, B)(Professional Matrix: II. C, L, M)(9, 10, 20, 25, 29)
11. adapt the pace and level of classroom activities to the cognitive levels of each student. (Conceptual Framework: A,B)(Professional Matrix: II. A, B, F, L, O)(Elementary Ed Matrix: G; II. C; IV. C; VII. A)(1, 10, 15)
12. plan evaluation procedures, utilizing both summative and formative techniques in evaluating student performance. (Conceptual Framework: A,B,C)(Professional Matrix: II. K, N, O)(1,4,5,10,13,18,38)
13. understand and utilize appropriate types of technology in science and math. (Conceptual Framework: A,B)(Professional Matrix: IV. A, B, C)(Elementary Ed Matrix: IV. I; VII. G)(34)
14. understand the importance of providing special instruction for children with special needs. (Conceptual Framework: A,B,C)(Professional Matrix: I. F; II. F, L; IV. A, B)(19, 23, 24, 36, 37)

VII. Course Content and Activities

- A. Planning, Standards, Problem Solving
- B. Technology
- C. Manipulatives
- D. Evaluation
- E. Adaptation to learning differences
- F. Cultural, Ethnic, and Gender Bias
- G. Nature of Math and Science
- H. Curriculum Models
- I. Process Skills
- J. Organization of materials, equipment and resources
- K. Laboratory Safety

Students will engage in cooperative learning activities to develop concepts and applications in math and science. Individual assignments are also expected.

Individual Activities:

1. Lesson Plans: Students will devise four lesson plans based on the Learning Cycle Model
2. Manipulatives Kit: Students will create a manipulatives kit with age and developmentally appropriate activities correlated to the Tennessee Science Framework
3. Learning Center: Students will create a learning center with age and developmentally appropriate activities
4. Students will teach lessons in the public schools
5. Students will critique each lesson taught in the public schools
6. Students will take 3 exams including the final

Grading Scale: A=93-100	Tests	30%
B=86-92	Lesson Plans	15%
C=77-85	Manipulatives Kit	20%
D=70-76	Learning Center	15%
Below 70 is not passing.	Field Exp/PC.	10%
	Attendance/Participation	10%

Any student eligible for and requesting academic accommodations due to a disability is requested to provide a letter of accommodation from PACE or Student Academic Support Center within the first two weeks of the semester.