PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS
THE STRUCTURE OF THE NUMBER SYSTEM
MATH 1410

Class Hours: 3.0 Credit Hours: 3.0
Laboratory Hours: 0.0 Revised: Fall 08

Catalog Course Description:
Recommended for prospective elementary education teachers. Topics include problem solving, numeration systems, integers, elementary number theory, rational numbers, decimals and algebraic applications.

Entry Level Standards:
Students must be able to read at the college level.

Prerequisites:
High school algebra I, algebra II, and geometry, plus an ACT math score of at least 19; or DSPM 0850 or equivalent math placement score.

Textbook(s) and Other Reference Materials Basic to the Course:

Textbook:

Required Supplies:
Scientific calculator with statistical capabilities/fractional capabilities is required. A graphing calculator such as the TI-83 or TI-84 is recommended.

I. Week/Unit/Topic Basis:

<table>
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<tr>
<th>Week</th>
<th>Topic</th>
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<tr>
<td>1</td>
<td>Introduction, Exploration with Patterns, and Using the Problem-solving Process</td>
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<tr>
<td>2</td>
<td>Numeration Systems (including other bases)</td>
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<td>3</td>
<td>Multicultural Number Systems Review Test #1</td>
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<tr>
<td>4</td>
<td>Modeling Whole Number Operations of Addition and Subtraction in Multiple Bases</td>
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<tr>
<td>5</td>
<td>Modeling Whole Number Operations of multiplication and division in Multiple Operations</td>
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<tr>
<td>6</td>
<td>Algorithms, Mental Math, and Estimation for Whole Number Operations</td>
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II. Course Objectives*:

A. Master critical thinking skills. VI.2
B. Construct, manipulate, and discuss mathematical systems. VI.1, 4
C. Master the real number system. VI.1, 3, 4
D. Understand mathematical reasoning in order to read, comprehend, and construct mathematical arguments. VI.1, 2

*Roman numerals after course objectives reference TBR’s general education goals.

III. Instructional Processes*:

Students will:

1. Successfully understand and interpret real world problems. Transitional Strategies, Active Learning Strategies, Mathematics Outcome

2. Successfully use a variety of problem solving strategies, both inductive and deductive reasoning. Active Learning Strategies, Mathematics Outcome

3. Work, either individually or in a group setting, to solve problems from different occupational fields. Solutions must be mathematically correct and be clear and correct in terms of the related occupational field. Communication Outcome, Transitional Strategies, Active Learning Strategies, Mathematics Outcome

4. Use calculator and computer technology as problem solving and exploration tools. Technological Literacy Outcome, Active Learning Strategies, Mathematics Outcome

5. Use a wide variety of mathematical modeling tools, both virtual and physical. Technological Literacy Outcome, Active Learning Strategies, Mathematics Outcome

*Strategies and outcomes listed after instructional processes reference TBR’s goals for strengthening general education knowledge and skills, connecting coursework to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.
IV. Expectations for Student Performance*:

Upon successful completion of this course, the student should be able to:

1. Utilize both inductive and deductive reasoning. A, D
2. Utilize and manipulate the real number system. B, C, D
3. Master and explain various problem-solving strategies. A, B, D
4. Explain and model algorithms on different base numerals.
5. Demonstrate knowledge of commutative, associative, and distributive laws. A, B, D
6. Define natural numbers, whole numbers, rational numbers, irrational numbers, and real numbers. A, B, C, D
7. Demonstrate knowledge of division algorithm and divisibility tests. B, C, D
8. Define prime numbers, composite numbers, greatest common divisor, and least common multiple. B, C
9. Compute prime factorization of a number and use in applications. C
10. Use modeling tools to demonstrate mathematical ideas and processes. B
11. Demonstrate a greater understanding and appreciation of mathematics and its applications to other disciplines. A

*Letters after performance expectations reference the course objectives listed above.

V. Evaluation:

A. Testing Procedures:

Students are evaluated primarily on the basis of tests, quizzes, homework, portfolio, and/or a comprehensive final exam. A minimum of three major tests (in addition to the final) is recommended.

B. Laboratory Expectations:

Students will be expected to keep a portfolio of all laboratory experiments and projects. The portfolio will serve as a collateral file of future teaching references.

C. Field Work:

N/A

D. Other Evaluation Methods:

Excessive absences may lower the final grade.
E. Grading Scale:

- 93 - 100  A
- 88 - 92   B+
- 83 - 87   B
- 78 - 82   C+
- 70 - 77   C
- 60 - 69   D
- Below 60 F

VI. Policies:

A. Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course (Pellissippi State Catalog). Individual departments/programs/disciplines, with the approval of the vice president of Academic and Student Affairs, may have requirements that are more stringent.

B. Academic Dishonesty:

Individual instructors must distribute their policies on academic dishonesty and calculator use during the first week of classes. In addition to other possible disciplinary sanctions that may be imposed as a result of academic misconduct, the instructor has the authority to assign either (1) an F or a zero for the assignment or (2) an F for the course.

C. Accommodations for disabilities:

If you need accommodations because of a disability, if you have emergency medical information to share, or if you need special arrangements in case the building must be evacuated, please inform the instructor immediately. Please see the instructor privately after class or in his/her office. Students must present a current accommodation plan from a staff member in Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by going to Goins 127 or 131 or by phone: 694-6751(Voice/TTY) or 539-7153.