Bossier Parish Community College
Master Syllabus

Course Prefix & Number: MATH 117 **Credit Hours:** 3-3-0

Course Title: Elementary Number Structure

Course Prerequisites: A grade of "C" or higher in MATH 102

Textbook(s): BPCC Custom Manipulative Kit, ISBN: 9780321854094
Billstein, Libeskind and Lott. A Problem Solving Approach to Mathematics for Elementary School Teachers, 12th edition, Pearson, 2015. ISBN: 9780321990594

Course Description: This course is designed for elementary education majors. The emphasis of the course is teaching number sense and problem solving. Topics include problem-solving strategies; number patterns; numeration system of base ten; conceptual understanding of addition, subtraction, multiplication and division of whole numbers; algorithms for operations of whole numbers; properties of whole numbers; estimation and mental math skills; factors; multiples; prime and composite numbers; prime factorization; meaning of fractions; equivalent fractions; mixed numbers and comparison of fractions; algorithms for operations of fractions; meaning of decimals; converting decimals to fractions; algorithms for operations of decimals; meaning of ratio and proportions and proportional reasoning; meaning of percent and converting between percent; decimals and fraction equivalency.

Learning Outcomes:
At the end of this course, the student will:

A. understand the four step process to approach solving problems and apply various problem-solving strategies to solve problems;
B. have a conceptual understanding of the operations of whole numbers and their properties and perform algorithms related to addition, subtraction, multiplication and division of whole numbers;
C. have knowledge of how the terms "factors, multiples, prime, and composite" relate to each other and apply the rules of divisibility to determine the factors of a positive whole number, perform the Fundamental Theorem of Arithmetic on any positive whole number and use this to find the Greatest Common Divisor and Least Common Multiple for a set of positive whole numbers;
D. have a conceptual understanding of the operations of fractions and perform algorithms related to addition, subtraction, multiplication and division of fractions and mixed numbers;
E. have a conceptual understanding of the operations of decimals and perform algorithms related to addition, subtraction, multiplication and division of decimals;
F. have a conceptual understanding of ratio, proportions and proportional reasoning; and
G. have a conceptual understanding of percent and finding the equivalencies between percent, fractions and decimals.

To achieve the learning outcomes, the student will or will be able to:
(The letter designations at the end of each statement refer to the learning outcome(s).)

1. understand Poyla's 4 step approach to problem solving; (A)
2. demonstrate the use of the eight problem solving strategies; (A)
3. identify mathematical patterns; (A)
4. identify the levels of Bloom's Taxonomy; (A)
5. classify numbers; (B)
6. demonstrate understanding of the base ten system; (B)
7. round whole numbers to indicated place value; (B)

8. write whole numbers in both word and expanded form; (B)
9. addition, subtraction, multiplication, and division of whole numbers using standard algorithm; (B)
10. addition, subtraction, multiplication, and division of whole numbers using alternate algorithms; (B)
11. demonstrate understanding of teaching methods of adding, subtracting, multiplying, and dividing whole numbers; (B)
12. apply properties of whole numbers; (B)
13. use manipulatives to demonstrate understanding of the operations of addition, subtraction, multiplication, and division of whole numbers; (B)
14. apply the divisibility rules; (C)
15. recognize factors, multiples, prime, and composite numbers; (C)
16. apply the Fundamental Theorem of Arithmetic; (C)
17. find the Greatest Common Divisor; (C)
18. find the Least Common Multiple; (C)
19. use manipulatives to demonstrate understanding of prime, composite, factors, multiples, GCD, and LCM; (C)
20. recognize proper fractions, improper fractions, and mixed numbers; (D)
21. order and compare fractions and mixed numbers; (D)
22. addition, subtraction, multiplication, and division of rational numbers using standard algorithm; (D)
23. addition, subtraction, multiplication, and division of rational numbers using alternate algorithms; (D)
24. use manipulatives to demonstrate understanding of the operations of addition, subtraction, multiplication, and division of rational numbers; (D)
25. apply properties of rational numbers; (D)
26. demonstrate understanding of teaching methods of adding, subtracting, multiplying, and dividing rational numbers; (D)
27. recognize decimal numbers; (E)
28. round decimal numbers to indicated place value; (E)
29. write decimal numbers in both word and expanded form; (E)
30. order and compare decimal numbers; (E)
31. addition, subtraction, multiplication, and division of decimal numbers using standard algorithm; (E)
32. addition, subtraction, multiplication, and division of decimal numbers using alternate algorithms; (E)
33. use manipulatives to demonstrate understanding of the operations of addition, subtraction, multiplication, and division of decimal numbers; (E)
34. apply properties of decimal numbers; (E)
35. demonstrate understanding of teaching methods of adding, subtracting, multiplying, and dividing decimal numbers; (E)
36. recognize ratios and proportions; (F)
37. solve proportions using cross product; (F)
38. solve proportions using a table; (F)
39. recognizing percent; (G)
40. use manipulatives to demonstrate understanding of percent; (G)
41. convert between percentage, fractions, and decimals; (G) and
42. solve applications of percent; (G)

Course Requirements: All students are required to take a comprehensive final exam and give one formal lesson presenation.

Revised: 9/20/2018

Course Grading Scale:

90 – 100 = A
80 – 89 = B
70 – 79 = C
60 – 69 = D
0 – 59 = F

Attendance Policy: The college attendance policy is available at http://www.bpcc.edu/catalog/current/academicpolicies.html

Course Fees: This course is accompanied with an additional non-refundable fee for supplemental materials, laboratory supplies, software licenses, certification exams and/or clinical fees.

Nondiscrimination Statement: Bossier Parish Community College does not discriminate on the basis of race, color, national origin, gender, age, religion, qualified disability, marital status, veteran's status, or sexual orientation in admission to its programs, services, or activities, in access to them, in treatment of individuals, or in any aspect of its operations. Bossier Parish Community College does not discriminate in its hiring or employment practices.

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