Salisbury University Department of Mathematical Sciences

MATH 230 : Fundamental Concepts II
Syllabus (Tentative)

Description: Continuation of the process begun in MATH 130 of preparing prospective elementary school teachers to teach mathematics. Like MATH 130, it fosters a thorough understanding of fundamental mathematics and emphasizes the ability to communicate this. 3 Hours Credit: Meets three hours per week. Meets General Education IVB or IVC.

Prerequisites: C or better in MATH 130.

Credit: Credit may only be received for one of MATH 104 and MATH 230

Intended Audience: For students in the Elementary Education program.

Objective: A continuation of MATH 130. To provide students with a thorough understanding of the mathematical concepts covered in grades one through eight, using approaches that support professional (NCTM) standards. To move prospective elementary school teachers through the mathematical content into the ability to explain mathematical ideas and relationships. To develop the ability to (a) explain mathematical concepts in everyday, but correct, language appropriate for the listener; and (b) to demonstrate mathematical ideas using physical models and/or activities. Participation in active learning (group work, use of manipulatives, etc.) is expected. Non-routine problem solving is included regularly throughout the semester.

Textbooks: *Reconceptualizing Mathematics*, 3rd edition by Judith Sowder, Larry Sowder, and Susan Nickerson

Topic	Weeks
Multiplicative Reasoning, Percents, Ratios, Rates and Proportions	4.5
Exploring multiplicative reasoning conceptually and with models such as tape diagrams and double number lines. Working with percents, ratios, and rates in contextualized problems that foster the use of multiple solution strategies. Will include connections to decimals.	
Signed Numbers and Operations with Them	1.5
A look at signed numbers and models for representing them with a focus on the integers. Interpreting the operations within the different models and a look at children's ways of reasoning about signed numbers.	
Big Ideas in Geometry and Measurement	2.5
A look at planar shapes and figures in space. Exploring the basic concepts of perimeter, area, and volume conceptually opposed to the formulaic approach. Looking at the basic concepts of measurement including the use of nonstandard units of measure and conversion amongst standard units. A look at the Pythagorean theorem in applications.	
Reasoning about Algebra and Change	4
Basic function concept; notation; representation - table, graph, formula; linear and non-linear functions; creation of graphs from collected data; analysis of properties of different types; creation and use of functions and equations to model situations in areas such as geometry, science, economics, social science, environmental studies, etc. A look at slope as rate of change and its connection to proportional reasoning.	
Tests	1.5
Total	**14**

Evaluation

Assignments, Quizzes, Classwork	20 – 40%
Tests	30 – 60%
Comprehensive Final Examination	20 – 30%

- Free tutoring is available for this course in the Spring and Fall semesters.
- Clear descriptions of thought processes, evidence of critical thinking, and effective communication must be demonstrated in written work.
- **Writing Across the Curriculum:** Students will be expected to communicate mathematics and mathematical ideas effectively in speech and writing. At the University Writing Center, trained consultants are ready to help you at any stage of the writing process. In addition to the important writing instruction that occurs in the classroom and during professors' office hours, the Center offers another site for learning about writing. **All students are encouraged to make use of these important services.**
- **NOTE:** Once a student has received credit, including transfer credit, for a course, credit may not be received for any course with material that is equivalent to it or is a prerequisite for it.