Janet Barresi
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Oklahoma State Department of Education

Mathematics of Finance
Curriculum Outline

Mathematics of Finance is a course approved by the Oklahoma State Board of Education as a mathematics course with content and/or rigor equal to or above Algebra I. As such, it qualifies as a course for meeting Oklahoma's graduation requirement in mathematics as specified in 70 O.S. § 11-103.6. The course was originally designed by and this publication was adapted with permission from Moore Public Schools.

In *Mathematics of Finance*, visual and physical models, calculators and other technologies are recommended to enhance both instruction and assessment. Graphing calculators and computer simulations and programs may be used to analyze and display data. By using models and technologies, students will formulate and answer questions and make valid inferences and decisions based on data shown in graphs, tables, and charts.

Course Outcome	Unit Outcome	*PASS** Outcome
I. Personal Earning Power The student will use functional relationships related to personal income to understand and compute earnings based on different methods of wage computation and deductions.	The student will: A. Use rates to categorize and compute components of income. B. Compute and compare earnings based on regular time, overtime, tips, etc., by solving, graphing, and analyzing linear equations. C. Use the graphing calculator to analyze the difference between compensation methods (i.e., hourly versus salaried). D. Compute commissions based on straight commission and item rate using literal equations. E. Use appropriate percentages to calculate deductions from wages (Social Security/FICA, etc.).	*PASS** (Revised 2002) Algebra I 2.6a 2.7 2.8b Algebra II 2.2 2.11

* Oklahoma's *Priority Academic Student Skills (PASS),* revised 2002

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II. Financial Management	The student will:	*PASS** (Revised 2002)
The student will use algebraic formulas, numerical techniques and graphs to solve problems related to financial planning	A. Explore types of checking accounts at different financial institutions, estimating check charges or amount earned on average balances (use systems of equations to compare financial benefits).	Algebra I 1.2a 2.7
	B. Define credit and list the advantages and disadvantages of using credit rather than cash.	2.8b
	C. Use various mathematical models in analyzing advantages and disadvantages in retail purchasing.	Algebra II 2.2
	D. Use the rules of exponents to determine repayment amount paid on a loan by using: $A = \frac{m(1-(1+r)^{-q})}{r}$	2.10
	E. Create an amortization schedule for a loan by using iterations, Internet, calculator, or spreadsheets to demonstrate changes in loan payoffs by changing monthly payments, interest rate, or years.	
	F. Use exponential and logarithmic models to determine consequences of credit limits and interest charges.	
	G. Use formulas to calculate information and payment penalties on credit card accounts: 1. Average daily balances $b = \frac{\Sigma \text{ daily balances}}{\text{Total days}}$ 2. Effective interest rate $i_{eff} = (1 + i/12)^{12} - 1$ 3. Payoff time $n = \frac{\log (M/(M-pr))}{\log (1 + r)}$ 4. Monthly payment $M = \frac{Pr(1+r)^n}{(1+r)^n - 1}$	

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III. Federal Income Tax The student will be able to compute Federal Income Tax using compound inequalities and optimization methods	The student will: A. Analyze and use forms W-2, 1040EZ, 1040A, and 1040 in computing Federal Income Tax. B. Calculate various itemized deductions. C. Explore Federal Withholding Tax as a piecewise linear function.	*PASS** (Revised 2002) Algebra I 2.6b 2.6c
IV. Financial Transactions The student will investigate the financial aspects of making major purchases (i.e., automobiles, homes), using linear functions and direct variation to make decisions in budgeting	The Student Will: A. Calculate markup and total loan amount of a car purchase by using the formula: $P = \frac{M[(1+r)^n - 1]}{r(1+r)^n}$ Students can find new car data from various Internet sites (i.e., Edmonds, NADA, Kelly Blue Book). B. Calculate the cost of operating a car 1. Fuel usage and maintenance 2. Linear vs. exponential depreciation 3. Insurance cost based on rate factors 4. Ownership vs. leasing. C. Examine the variables in buying, owning, and selling a house 1. Renting vs. owning 2. Qualifying for a loan 3. Types of homes 4. Monthly payment $\frac{Pr(1+r)^n}{(1+r)^n - 1}$ 5. Operating and maintenance costs 6. Tax considerations.	*PASS** (Revised 2002) Algebra I 1.2a 2.9a Algebra II 2.10 2.13

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V. Budgeting The student will analyze the components of developing a useful, personal budget	The student will: A. Identify essential and nonessential monthly expenses 1. Housing 2. Food 3. Transportation 4. Personal Needs 5. Entertainment 6. Medical 7. Miscellaneous (child care, schooling, etc.). B. Develop a monthly budget and determine ways to control expenses. C. Identify and compare different types of savings accounts. D. Use the exponential growth model and the Rule of 72 to compute compound interest.	*PASS** (Revised 2002) Algebra I 2.7 Algebra II 2.2 2.10

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