Applied Mathematics I

Sample Course Based on P21 Sample Student Outcomes

Applied Mathematics I provides learners an opportunity to apply mathematical concepts and skills from earlier high school mathematics courses in practical situations while focusing on learning skills associated with information and communication technology.

**Strands:** Algebra, Data Analysis and Probability

**COMPETENCY GOAL 1:** The learner will use graphs, tables, symbolic manipulation, and technology to communicate mathematically and solve problems.

**Objectives**

1.01 Use the language of mathematics to express mathematical ideas in content specific and applied settings.
1.02 Use online bulletin boards or other web 2.0 tools to engage in discussions of math concepts with people (students and/or experts) from around the world.
1.03 Apply an appropriate strategy to solve problems both individually and in a group.
1.04 Use a variety of problem-solving tools such as graphing calculators, probes, GPS, and geometry tool software to formulate, approach, and solve problems.
1.05 Employ more complex problem-solving methods to develop a deeper understanding of mathematics, such as simulating a construction project (within certain material and budget constraints).
1.06 Use estimation to determine the reasonableness of an answer and use word-processing software to explain the process.

**COMPETENCY GOAL 2:** The learner will use graphs, tables, and technology to model relationships.

**Objectives**

2.01 Illustrate a mathematical concept, connection, or problem and its applicability to a real-world context.
2.02 Use physical and digital models to demonstrate mathematical concepts.
2.03 Demonstrate the development of a mathematical conjecture and create a convincing proof of its validity or disproof.

**COMPETENCY GOAL 3:** The learner will collect and analyze data and apply statistical concepts to solve problems.
Objectives

3.01 Construct and interpret displays of data to solve problems.
3.02 Develop methods to collect univariate and bivariate data to describe trends within and between populations or local settings.
3.03 Find and analyze data sets and collection processes with respect to the authenticity of the data and legitimacy of its use for various purposes.
3.04 Use graphing calculators and probes to collect and analyze environmental data (e.g. pH of streams) or contextual data (e.g. speed of cars in school zones).
3.05 Identify a potential community issue that can be analyzed using a wide range of mathematical tools, develop an analysis plan, and develop a report presenting data and possible interventions.
3.06 Develop an audience-appropriate presentation that uses analysis, interpretation and display of data and related inferences to describe the situation and possible solutions.
3.07 Analyze statistical techniques, sampling bias, and population parameters in published scientific or economic reports and evaluate the validity of the reports’ findings.
Applied Mathematics II

Sample Course Based on National Standards in K-12 Personal Finance Education
http://www.jumpstart.org/national_standardsK12.html#The_Standards

Applied Mathematics II provides learners an opportunity to apply mathematical concepts and skills from earlier high school mathematics courses to financial situations while using learning skills associated with information and communication technology.

Strands: Algebra, Data Analysis and Probability

COMPETENCY GOAL 1: The learner will use graphs, tables, symbolic manipulation, and technology to communicate mathematically and solve problems.

Objectives
1.01 Identify a career goal and develop a plan and timetable for achieving it, including educational/training requirements, costs, and possible debt.
1.02 Determine the cost of achieving a long-term goal.
1.03 Determine the future income needed to maintain a current standard of living.
1.04 Explain the effect on take-home pay of changing the allowances claimed on an “Employee’s Withholding Allowance Certificate” (IRS Form W-4).
1.05 Develop, monitor, and modify a personal financial plan, including goals, net worth statement, cash flow statement, insurance plan, investing plan, and a budget.
1.06 Calculate investment growth given different amounts, times, rates of return, and frequency of compounding.

COMPETENCY GOAL 2: The learner will use graphs, tables, and technology to model relationships.

Objectives
2.01 Analyze how inflation affects financial decisions.
2.02 Explain the effect of inflation on income.
2.03 Describe the effect of inflation on buying power.
2.04 Describe the effect of inflation on investment growth.
2.05 Analyze how taxes affect financial decisions.
2.06 Explain how credit card grace periods, methods of interest calculation, and fees affect borrowing costs.
2.07 Give examples of how decisions made today can affect future opportunities.

COMPETENCY GOAL 3: The learner will collect and analyze data to solve problems.

Objectives
3.01 Determine whether financial information is objective, accurate, and current.
3.02 Investigate current types of consumer fraud, including online scams.
3.03 Identify relevant financial information needed to make a decision when given a scenario.
3.04 Compare the benefits and costs of owning a house versus renting housing.
3.05 Compare the costs of auto insurance for the same vehicle, given two different deductibles and two different liability coverage limits.
3.06 Identify and compare saving strategies, including “paying yourself first”, using payroll deduction, and comparison-shopping to spend less.
3.07 Use systematic decision making to select the appropriate investments for accumulating the money for a four-year college education, a wedding, a new business startup, the down payments on a new car and a house, and retirement.