

# Changing Times, Changing Students

February 11-12, 2010

## SMART Math Redesign A Dream Come True



A Tennessee Board of Regents Institution

**Mathematics Department**

**[www.jsc.edu/smart-math](http://www.jsc.edu/smart-math)**

**Mary Jane Bassett**  
Dean of Academic Support  
[mbassett@jsc.edu](mailto:mbassett@jsc.edu)

**Betty Frost**  
Redesign Team Leader  
[bfrost@jsc.edu](mailto:bfrost@jsc.edu)

**Tim Britt**  
Mathematics Department  
[tbritt@jsc.edu](mailto:tbritt@jsc.edu)

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## SMART Math Module Descriptions

### **MODULE ONE: INTEGERS**

Topics include exponential notation and order of operations, integers and the number line, addition, subtraction, multiplication and division of integers, order of operations, introduction to algebraic expressions, like terms, and solving one-step equations.

### **MODULE TWO: FRACTIONS**

Topics include fraction notation, multiplication, division, addition, and subtraction of fractions and mixed numerals and solving equations with applications. (Prerequisite: Module One)

### **MODULE THREE: DECIMALS**

Topics include decimal notation, addition, subtraction, multiplication and division of decimals, solving equations, American and metric units of measure, weight and mass, capacity, time and temperature, ratio and proportion, percent notation, graphs. (Prerequisite: Module Two)

### **MODULE FOUR: REAL NUMBERS**

Topics include introduction to algebra, the real numbers, addition, subtraction, multiplication and division of real numbers, properties of real numbers, and order of operations. (Prerequisite: Module Three)

### **MODULE FIVE: LINEAR EQUATIONS AND INEQUALITIES**

Topics include solving linear equations by the addition and multiplication principle, formulas, solving and inequalities, ratio/proportion with applications. (Prerequisite: Module Four)

### **MODULE SIX: GRAPHING LINEAR EQUATIONS AND INEQUALITIES**

Topics include graphs of linear equations in two variables, intercepts, slope, equations of lines (one point with slope) and graphing using slope and y-intercept. (Prerequisite: Module Five)

### **MODULE SEVEN: POLYNOMIALS**

Topics include integers as exponents, scientific notation, and introduction to polynomials, addition, subtraction and multiplication of polynomials, special products, operations with polynomials in several variables, division of polynomials by monomials. (Prerequisite: Module Five)

### **MODULE EIGHT: FACTORING**

Topics include factoring trinomials, trinomial squares and difference of squares, general strategies for factoring, solving quadratic equations by factoring. (Prerequisite: Module Seven)

### **MODULE NINE: RATIONAL EXPRESSIONS**

Topics include multiplying, dividing, adding, and subtracting rational expressions, simplifying rational expressions, solving rational equations, applications. (Prerequisite: Module Eight)

### **MODULE TEN: MORE GRAPHING AND SYSTEMS**

Topics include parallel and perpendicular lines, equations of lines using point-slope, graphing inequalities in two variables, solving systems of equations in two variables using graphing, substitution and elimination methods, applications, and graphing systems of inequalities in two variables. (Prerequisite: Module Six)

### **MODULE ELEVEN: RADICAL EXPRESSIONS**

Topics include radical expressions, multiplying and simplifying radical expressions, quotients involving radical expressions (only 1 term denominators), addition and subtraction, radical equations, applications with right triangles and the distance formula. (Prerequisite: Module Eight)

### **MODULE TWELVE: QUADRATIC EQUATIONS**

Topics include the complex numbers, solving quadratic equations by square root method, the quadratic formula, and graphs of quadratic equations, functions, domain and range. (Prerequisite: Module Eleven)

## General Education Math Courses with Module Prerequisites

### **MATH 1010 Math for Liberal Arts**

Credit Hrs: 3 Pre-Req: DSPM Mods. 1-7

This course is designed for students who are seeking an A.S. or A.A. University Parallel degree in a major that does not include programs of science, mathematics, engineering, or computer science. It will satisfy the mathematics requirement for other A.S. and A.A. University parallel majors. Topics include sets, logic, geometry, finance, probability, statistics, and applications.

### **MATH 1410 Topics in Contemporary Math I**

Credit Hrs: 3 Pre-Req: DSPM Mods. 1-8

A conceptual and problem solving approach to sets, numeration systems, algorithms for addition, subtraction, multiplication, and division in the real number system, elementary number theory, relations and functions.

### **MATH 1420 Topics in Contemporary Math II**

Credit Hrs: 3 Pre-Req: DSPM Mods. 1-8

A conceptual and problem solving approach to combinatorics, discrete probability, descriptive statistics, informal solid and plane geometry, transformations, measurement, and coordinate geometry.

### **MATH 1530 Statistics and Probability**

Credit Hrs: 3 Pre-Req: DSPM Mods. 1-8

Topics include basic statistical concepts, elementary probability theory, normal distributions and applications, statistical inference, regression lines, and correlation. Computer applications will be investigated throughout the course.

### **MATH 1630 Finite Mathematics**

Credit Hrs: 3 Pre-Req: DSPM Mods. 1-7

Introduction to linear functions, mathematics of finance (interest, annuities, amortization), linear programming, matrix algebra, and probability with applications in each of these areas.

### **MATH 1710 Precalculus Algebra**

Credit Hrs: 3 Pre-Req: DSPM Mods. 1-12

Topics include functions and graphs, polynomial equations, systems of equations, matrices, determinants, exponential and logarithmic functions, sequences and series, binomial expansion.

### **MATH 1720 Trigonometry**

Pre-Req: MATH 1710

### **MATH 1830 Applied Calculus**

Pre-Req: MATH 1710

### **MATH 1910 Calculus I**

Pre-Req: MATH 1720

### Approved Gen Ed Math Courses by Major 2009-2010 Catalog

Major	1010	1410	1420	1530	1630	1710	OTHER
ACCOUNTING						X	1830
AGRICULTURE				X	X	X	1910
ART	X	X	X	X	X	X	1720 or higher
BIOLOGY						X	1720 or higher
BUSINESS ADMIN						X	1830
CHEMISTRY							1910
COMMUNICATION	X	X	X	X	X	X	1720 or higher
CRIMINAL JUSTICE				X	X	X	
EDUCATION		**	**	X	X	X	1910
ENGLISH	X	X	X	X	X	X	1720 or higher
GENERAL STUDIES	X	X	X	X	X	X	1720 or higher
HEALTH & PHYS ED				X	X	X	1910
HISTORY				X	X	X	1720 or higher
INFORMATION SYSTEMS	X	X	X	X	X	X	1720 or higher
MATHEMATICS				X		X	1720 or higher
PHILOSOPHY	X	X	X	X	X	X	1720 or higher
PHYSICAL SCIENCE						X	1720 or higher
POLITICAL SCIENCE				X	X	X	
PRE-ENGINEERING							1910 or higher
PRE-LAW				X	X	X	
PRE-MED PROFESSIONS							1830 or 1910
PRE-NURSING						X	
PSYCHOLOGY	X	X	X	X	X	X	X
PUBLIC ADMINISTRATION				X	X	X	
SOCIAL WORK	X	X	X	X	X	X	X
SOCIOLOGY	X	X	X	X	X	X	1720 or higher
TEACHING K-6 INT STUDIES		**	**	X	X	X	1910

\*\*For EDU & AST, MATH 1410 and 1420 are required core courses.


Major/Concentration	1010	1410	1420	1530	1630	1710	1720	1830	OTHER
Business Studies/Administrative Office Mgmt	X	X	X	X	X	X	X	X	Natural Science
Business Studies/Business	X	X	X	X	X	X	X	X	Natural Science
Computer Info Systems/ Cisco CNNA		X	X	X	X	X	X	X	Natural Science
Computer Info Systems/ Information Assurance		X	X	X	X	X	X	X	Natural Science
Computer Info Systems/Network Administration		X	X	X	X	X	X	X	Natural Science
Computer Info Systems/PC Support & Help Desk		X	X	X	X	X	X	X	Natural Science
Computer Info Systems/Software Developer		X	X	X	X	X	X	X	Natural Science
Early Childhood Education		X	X	(or higher level math with advisor's approval)					
General Technology	X	X	X	X	X	X	X	X	Natural Science
Industrial Technology/Applied Manufacturing				X	(or higher level math)				
Industrial Technology/Electromechanical				X	(or higher level math)				
Industrial Technology/Quality Sciences				X	(or higher level math)				
Respiratory Care Technology		X		X	X				
Radiography		X	(or higher level math)						

The following Associate of Applied Science Degrees requires one General Ed Mathematics/science Course as listed.

# SMART Math


## A Dream Come True!

www.jscc.edu/smart-math



**Jackson State**  
Community College

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www.thencat.org

## Mastery Learning

- New students begin with proctored Pre-Test on Module 1
  - 80% mastery moves student to next module
- If less than 80% student completes
  - ✓ Guided Studies – (workbook format)
  - ✓ Homework in MyMathLab
  - ✓ Practice Test in MyMathLab
  - ✓ Post Test in MyMathLab
- 80% mastery required to move from one homework assignment to next
- 75% mastery required on proctored post test

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## Modularization

12 modules replaced 3 traditional courses.

MODULES	TRADITIONAL COURSE
1, 2, 3	Basic Mathematics
4, 5, 6, 7	Elementary Algebra
8, 9, 10, 11, 12	Intermediate Algebra

To satisfy a module the overall grade must be at least 75%.

Components of each module grade:

Attendance	5%
Notebooks	10%
Homework	15%
Post-Test (Proctored)	70%

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## Procedure for Modularization

- Course competencies from the three traditional courses were separated into 12 clearly defined modules
- Prerequisite modules were identified for success in
  - general education math courses
  - other college level courses
  - programs not requiring college level math
- Curriculum Committee approved major change in Developmental Math requirements
- Procedures were set up to advise students of their multi-exit opportunities based on their career choice
- Advisor training sessions were conducted

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## Programs of Study Module Requirements

Required Modules	Number of programs	DSPM Students Fall 2008/Spring 2009
12 modules	<b>7</b>	20.3 %
8 modules	<b>4</b>	31.2 %
7 modules	<b>35</b>	47.1 %
6 modules	<b>1</b>	0.8 %
4 modules	<b>1</b>	0.6 %

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## What is your dream?

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