STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK

MASTER SYLLABUS

Math 101 – Applied College Mathematics

Created by: Frederick Saburro

Updated by: Frederick Saburro

Canino School of Engineering Technology

Department: Mathematics

Semester/Year: Spring/2020

A. **TITLE**: **Applied College Mathematics**

B. **COURSE NUMBER: MATH 101**

C. **CREDIT HOURS:**
Credit Hours: 4
Lecture Hours: 4 per week
Lab Hours: 0 per week

Course Length: 15 weeks

D. **WRITING INTENSIVE COURSE**: No

E. **GER CATEGORY: None:**

F. **SEMESTER(S) OFFERED: Fall**

G. **COURSE DESCRIPTION:**

This course is designed to prepare students for success in technical and pre-engineering technology programs. It assumes an algebraic background at an introductory level. The course connects mathematical concepts and procedures to real-life applications relevant to a variety of technical trade fields. Applications using algebra concepts are stressed in this course.

H. **PRE-REQUISITES: None**

I. **CO-REQUISITES: None**

J. STUDENT LEARNING OUTCOMES:

By the end of this course, the student will be able to:

Course Student Learning Outcome [SLO]	***Program Student Learning Outcome [PSLO]***	***GER*** *[If Applicable]*	***ISLO & SUBSETS***	
1. Perform multistep calculations with the aid of a calculator.			3-Foundational Skills	QTR
2. Use Dimensional Analysis to perform basic conversions for units of measurement within and between the English and Metric systems.			3-Foundational Skills	QTR
3. Graph linear equations.			3-Foundational Skills	QTR
4. Solve multi-step equations, manipulate formulas, and solve a system of linear equations.			3-Foundational Skills	QTR
5. Organize the solution to a problem and use estimation to determine the reasonableness of the answer.			3-Foundational Skills	QTR

KEY	**Institutional Student Learning Outcomes [ISLO 1 – 5]**
ISLO #	**ISLO & Subsets**
1	**Communication Skills** Oral [O], Written [W]
2	**Critical Thinking** *Critical Analysis [CA], Inquiry & Analysis [IA] , Problem Solving [PS]*
3	**Foundational Skills** *Information Management [IM], Quantitative Lit, /Reasoning [QTR]*
4	**Social Responsibility** *Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]*
5	**Industry, Professional, Discipline Specific Knowledge and Skills**

K. APPLIED LEARNING COMPONENT: No

L. TEXTS:

Carman and Saunders (2014), *Mathematics for the Trades: A Guided Approach (10th Ed.).* Boston, MA: Pearson Education.
Other sources.

M. REFERENCES: N/A

N. EQUIPMENT: None

O. GRADING METHOD: A - F

P. SUGGESTED MEASUREMENT CRITERIA/METHODS:

- Homework
- Quizzes
- Exams
- Participation
- Projects

Q. DETAILED COURSE OUTLINE:

I. Ratio, Proportion, and Percent
   A. Review of ratio and proportion
   B. Review of percent
   C. Applications of percent calculations, to include:
      1. Calculate work orders
      2. Determine energy efficiency
   D. Applications of ratio and proportion, to include:
      1. Oil to fuel ratios
      2. Compression ratios
      3. Gear ratios

II. Measurement
   A. Working with measurement numbers
   B. Read a ruler, a dial and Vernier caliper, and a micrometer
   C. Decimal equivalences of quarters and eights
   D. English units and unit conversion
   E. Metric units and unit conversion
   F. English-Metric conversions and Metric-English conversions
   G. Inch-lb, foot-lb, and Nm
   H. Applications

III. Algebra Topics
- A. Exponents and square roots
- B. Order of operations
- C. Scientific notation
- D. Evaluating algebraic expressions and formulas
- E. Solve simple equations involving one variable
- F. Solve more complex equations:
    1. With parenthesis
    2. Variables on both sides of an equation
- G. Manipulating formulas,
- H. Applications, to include:
    1. Kirchhoff's Law
    2. Ideal Gas Law
    3. Boyle's Law

IV. Practical Plane Geometry
- A. Labeling, measuring, and drawing angles
- B. Area and perimeter of polygons
- C. Pythagorean theorem
- D. Circumference and area of circles
- E. Applications, to include:
    1. Cam duration
    2. Cam overlap

V. Solid Figures – Volume and Surface Area
- A. Prisms and cylinders
- B. Pyramids and cones
- C. Spheres
- D. Cones
- E. Applications, to include:
    1. Calculate displacement when bore and/or stroke is varied.
    2. Ideal Gas Law

VI. Trigonometry
- A. Angles
- B. Trigonometric ratios
- C. Solving right triangles
- D. Applications, to include:
    1. Sine Bar

VII. Systems of equations
- A. Solve by graphing
- B. Solve by substitution
- C. Solve by elimination
- D. Applications

VIII. Hexadecimal
- A. Change to Base 2
- B. Change to Base 10
- C. Applications

IX. Switching Circuits
- A. Use symbolic statements to represent Series and Parallel Circuits
- B. Draw Switching Circuits that represent symbolic statements
- C. Equivalent Circuits

R. <u>LABORATORY OUTLINE</u>: None

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Department: Mathematics

Semester/Year: Spring/2019

A. **TITLE**: **Applied College Mathematics**

B. **COURSE NUMBER: Math 101**

C. **CREDIT HOURS: 3 credit hour(s) per week for 15 weeks**

D. **WRITING INTENSIVE COURSE**: No

E. **GER CATEGORY: None:**

F. **SEMESTER(S) OFFERED: Fall**

G. **COURSE DESCRIPTION:**

This course is designed to prepare students for success in technical and pre-engineering technology programs. It assumes an algebraic background at an introductory level. The course connects mathematical concepts and procedures to real-life applications relevant to a variety of technical trade fields. Applications using algebra concepts are stressed in this course.

H. **PRE-REQUISITES: None**

CO-REQUISITES: None

I. STUDENT LEARNING OUTCOMES:

By the end of this course, the student will be able to:

Course Student Learning Outcome [SLO]	***Program Student Learning Outcome [PSLO]***	***GER*** *[If Applicable]*	***ISLO & SUBSETS***	
1. Perform multistep calculations with the aid of a calculator.			3-Foundational Skills	QTR
2. Use Dimensional Analysis to perform basic conversions for units of measurement within and between the English and Metric systems.			3-Foundational Skills	QTR
3. Graph linear equations.			3-Foundational Skills	QTR
4. Solve multi-step equations, manipulate formulas and solve a system of linear equations.			3-Foundational Skills	QTR
5. Organize the solution to a problem and use estimation to determine the reasonableness of the answer.			3-Foundational Skills	QTR
6. Organize the solution to a problem and use estimation to determine the reasonableness of the answer.			3-Foundational Skills	QTR

J. APPLIED LEARNING COMPONENT: No

K. TEXTS:

Carman and Saunders (2014), *Mathematics for the Trades: A Guided Approach (10th Ed.).* Boston, MA: Pearson Education.

L. REFERENCES: N/A

M. EQUIPMENT: None

N. GRADING METHOD: A - F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

- Homework
- Quizzes
- Exams
- Participation
- Projects

P. DETAILED COURSE OUTLINE:

I. Ratio, Proportion, and Percent
   A. Review of ratio and proportion
   B. Review of percent
   C. Applications of percent calculations
   D. Applications of ratio and proportion

II. Measurement
   A. Working with measurement numbers
   B. English units and unit conversion
   C. Metric units
   D. English-Metric conversions and Metric-English conversions
   E. Technical applications with measurement

III. Pre-Algebra Topics
   A. Exponents and square roots
   B. Order of operations with exponents
   C. Scientific notation and powers of 10
   D. Technical applications using exponents and scientific notation

IV. Basic Algebra
   A. Algebraic language and formulas
   B. Algebraic expressions
   C. Evaluating formulas
   D. Evaluate literal expressions
   E. Solve simple equations
   F. Graph linear equations

V. Review of Fundamental Algebraic Concepts
   A. Algebraic language and formulas
   B. Evaluating algebraic expressions and formulas
   C. Combining like terms
   D. Solve simple equations involving one variable
   E. Solve equations involving two operations
   F. Solving equations with variables on two sides
   G. Manipulating formulas
   H. Multiplying and dividing simple factors
   I. Applications

VI. Practical Plane Geometry
   A. Labeling, measuring, classifying, and drawing angles
   B. Area and perimeter of polygons
   C. Pythagorean theorem
   D. Circumference and area of circles
   E. Applications

VII. Solid Figures – Volume and Surface Area
   A. Prisms
   B. Pyramids and frustums of pyramids
   C. Cylinders and spheres
   D. Cones and frustums of cones
   E. Applications

VIII. Trigonometry
   A. Angles and triangles
   B. Trigonometric ratios
   C. Solving right triangles
   D. Applications

IX. Algebra
   A. Systems of equations
   B. Solving systems of equations by graphing
   C. Solving systems of equations by substitution
   D. Solving systems of equations by elimination
   E. Applications

Q. <u>LABORATORY OUTLINE</u>: None