



**I. COURSE DESCRIPTION:**

The main focus of this course is towards the application of mathematics as it relates to the solution of problems common to the Automotive Trades. Using a combination of arithmetic, algebra and geometry, students will be required to calculate values for area, circumference, volume, gear ratio's and OHM'S Law including series, parallel and series-parallel circuits.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

Upon successful completion of this course, the student will demonstrate the ability to:

1. ***Work with Whole Numbers, Fractions and Mixed Numbers***

Potential Elements of the Performance:

***Understand the Following Terms***

- Numerator / Denominator
- Proper Fraction / Improper Fraction
- Mixed Number

***Review the following Skills***

- Reducing a Fraction
- Changing Improper Fractions into Mixed Numbers
- Changing Mixed Numbers into Improper Fractions
- Basic Principles of Multiplication of Common Fractions
- Basic Principles of Division of Common Fractions
- Dividing Fractions and Mixed Numbers and/or Whole Numbers
- Basic Principles of Addition of Common Fractions
- Adding Common Fractions, Mixed Numbers and Whole Numbers
- Basic Principles of Subtraction of Common Fractions
- Subtracting a Fraction from a Whole Number
- Subtracting a Mixed Number from a Whole Number

2. ***Converting between Fractions and Decimal Fraction***

Potential Elements of the Performance:

***Review the following Skills***

- Convert a Proper Fraction to its Decimal Equivalent
- Convert a Decimal Fraction to a Proper Fraction
- Convert a Decimal Fraction to a specified Fraction of an Imperial Inch
- Convert an Mixed Fraction to a Mixed Decimal Number
- Convert a Mixed Decimal Number to a Mixed Fraction

### 3. ***Imperial and Metric Units***

Potential Elements of the Performance:

***Understand the Use of Metric Prefix***

- milli , centi , deci , kilo
- Convert values between each prefix
- Convert values between English and Metric Units using...
- (Table I - Equivalent English and Metric Units of Measure - page 202)
- Convert between various Imperial Units of Measurements

***Understand the Following Terms***

- Circumference
- Diameter / Bore
- Pi

***Calculate the Following Values***

- Area, Circumference and Perimeter of a Circle
- Volume of a Cylinder
- Area and Perimeter of a Rectangle, Square and Triangle
- Volume of a Rectangle and a Square

### 4. ***Determine Ratios and Proportions***

Potential Elements of the Performance:

***Understand the Following***

- What is a ratio?
- Is it necessary to reduce a ratio to its lowest terms?

***Calculate the Following***

- What is gear ratio and how is it calculated?
- What is a pulley ratio and how is it calculated?
- What is a compression ratio and how is it calculated?
- What is a transmission gear ratio and how is it calculated?
- What is an axle or differential ratio and how is it calculated?
- What is total gear reduction a ratio of?
- How is total gear reduction calculated?

### 5. ***Solve Problems using OHM's Law***

Potential Elements of the Performance:

***Understand the Following***

- What relationship does OHM'S Law describe?
- What is the mathematical formula for OHM'S Law
- If voltage is increased current is increased.
- If voltage is decreased current flow is decreased.
- If resistance is increased current flow is decreased.

***The Series Circuit CCT***

- How is a series circuit identified?
- How is Total Resistance calculated?
- How does current flow?
- How are individual voltage drops calculated?

***The Parallel Circuit CCT***

- How is a parallel circuit identified?
- How is Total Resistance calculated?
- How voltage current flow?
- How are individual current drops calculated?

***The Series-Parallel Circuit CCT***

- How is a series-parallel circuit identified?
- What should be the first step in solving a series-parallel CCT problem?
- How is the Total Resistance calculated?
- How does current flow?
- How does voltage flow?

***Calculate solutions to problems involving:***

- Series Circuits CCT.
- Parallel Circuits CCT.
- Series-Parallel Circuits CCT.

**III. TOPICS:**

1. Whole Numbers, Fractions and Mixed Numbers
2. Converting between Fractions and Decimal Fraction
3. Imperial and Metric Units
4. Ratio and Proportion
5. Ohm's Law

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

Practical Problems in Mathematics for the Automotive Technicians (6<sup>th</sup> Edition)  
Scientific Calculator (c/w Percent, Square Root and Trigonometric Functions)

## V. EVALUATION PROCESS/GRADING SYSTEM:

### NOTE

1. Re-writes are NOT allowed for any written assignment, quiz or test.

The final course grade will be calculated using the following list of weighted factors:

Tests*	=	70 %
Assignments*	=	30 %

Assignments and Tests are due on the day and at the time specified.

***Late assignments will not be accepted while any missed test will count as a failure.***

The only exception to this rule shall be those arising from legitimate extenuating circumstances explained via a written note from the student.

The following semester grades will be assigned to all students.

<b>Grade</b>	<b><u>Definition</u></b>	<b><i>Grade Point Equivalent</i></b>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

**VI. SPECIAL NOTES:**Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

Retention of course outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course outline amendments:

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

**VII. PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

**VIII. DIRECT CREDIT TRANSFERS:**

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean’s secretary. Students will be required to provide a transcript and course outline related to the course in question.