

# Flow Chart of Math IV Pacing Guide (Automotive)

**Pre-knowledge**  
(First Semester) Completed by  
the Mathematics Instructor

## Embedded Math within Curriculum 2<sup>nd</sup> and 3<sup>rd</sup> Semesters

### Module I

#### Competency 1:

The Study of angle measurements, degrees, fractional degrees and minutes, adding and subtracting angular measurements

#### Competency 2:

To study geometric circumference, circular measurements, arc lengths, and the area and volume, of cylinders

#### Competency 3:

To study the metric system units of measure and complete assigned conversions between metric and Standard English forms

#### Competency 4:

To study integers & signed numbers, absolute values, (engine coolants and alignment adjustments)

### Module II

#### Competency 1:

Simplifying ratios and identifying ratios verses rates

#### Competency 2:

Set up and solve proportions, define & calculate direct and indirect proportions

#### Competency 3:

To convert decimals and fractions to percents, solve problems using percents, and understand gear, fluid, and engine compression ratios

#### Competency 4:

To calculate repair costs, discounts, interest, payments, profit/loss, commissions, and tax payments

To complete repair orders

### Module III

#### Competency 1:

To study the volume of a cylinder, engine specification, compression ratio, valve timing, intro to torque and horsepower

#### Competency 2:

To study formulas for hp loss, torque, in<sup>3</sup> displacement, theoretic air capacity, volume efficiency, engine fluid capacity and volumetric efficiency

#### Competency 3:

To study the relationship between voltage, current and resistance utilizing Ohms law, describe battery ratings, and determine proper wire size and study range and domain using an Oscilloscope. (Graph Theory)

#### Competency 4:

To determine transmission gear ratios, torque, force, and pressure, Describe the difference between speed and torque. Explain relationships between engine speed, transmission ratio, drive axle ratio, and tire diameter on vehicle speed.

### Module IV

#### Competency 1:

To study volume in a cylinder, determine hydraulic force, steering and suspension, brake operation & worn components, weight transfer, and alignment adjustment angles

#### Competency 2:

Learn how to read digital meters, scale measurements, and analog meters

#### Competency 3:

Learn how to read dial indicators, micrometers, and identify proper thread sizes

#### Competency 4:

To calculate and analyze wave patterns using the concept of range and domain illustrated by time vs. amplitude on the X & Y Cartesian coordinate plane

### Post-knowledge

Last Semester- Real World Situational  
Math Project  
Designed by the Math Instructor and  
Program Instructor