



# Engineering Program

|                   |                                  |
|-------------------|----------------------------------|
| Specialization    | Automotive Maintenance           |
| Course Number     | 20211122                         |
| Course Title      | Vehicle chassis systems workshop |
| Credit Hours      | 2                                |
| Theoretical Hours | 0                                |
| Practical Hours   | 6                                |



**Brief Course Description:**

Safety procedures. Tools, instruments. Assembly, disassembly and servicing of suspension system, steering system, braking system ,Wheels and Tiers ,Wheel alignment and Computerizes chassis systems. Computerizes chassis systems fault diagnosis by using Scan Tools.

**Course Objectives:**

Upon the completion of this course, the student will be able to:

1. Applying safety rules in the work.
2. Disassembly, inspection and assembly of vehicle chassis systems components.
3. Removal and installation of chassis systems components.
4. Using scan tools to diagnose computerizes chassis systems faults.
5. troubleshooting chassis systems problems.



## Detailed Course Outline:

| Unit Number | Unit Title                         | Unit Content   | Time Needed (hr) |
|-------------|------------------------------------|--|------------------|
| 1.          | <b>Servicing Steering system</b>   | <ul style="list-style-type: none"> <li>• Safety precaution.</li> <li>• Disassembly, inspection and assembly of steering wheel and column.</li> <li>• Disassembly, inspection and assembly of rack and pinion manual steering gearbox.</li> <li>• Disassembly, inspection and assembly of reticulating ball manual steering box.</li> <li>• Servicing the power steering system.</li> <li>• Servicing connecting rods and joints.</li> <li>• Servicing the steering system electronic control.</li> <li>• Steering system trouble diagnosis.</li> </ul> | 15               |
| 2.          | <b>Servicing suspension system</b> | <ul style="list-style-type: none"> <li>• Safety precautions.</li> <li>• Removal, inspection and installation of springs.</li> <li>• Removal, inspection and installation of shock absorbers.</li> <li>• Removal, inspection and installation of ball joints.</li> <li>• Removal, inspection and installation of McPherson-strut.</li> <li>• Removal, inspection and installation of wheel hub.</li> <li>• Servicing of electronic suspension.</li> <li>• Suspension system trouble diagnosis.</li> </ul>   | 15               |
| 3.          | <b>Servicing brake system</b>      | <ul style="list-style-type: none"> <li>• Safety precaution.</li> <li>• Removal, disassembly, inspection, reassembly and installation of master cylinder.</li> <li>• Removal, inspection and installation of servo brake.</li> </ul>  | 15               |

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|----|---|---|----|
|    |   | <ul style="list-style-type: none"> <li>• Servicing the brake lines and hoses.</li> <li>• Servicing the disk brake assembly.</li> <li>• Servicing the drum brake assembly.</li> <li>• Servicing the hand brake assembly.</li> <li>• Brake system bleeding.</li> <li>• Brake system trouble diagnosis.</li> </ul>   |    |
| 4. | <b>Wheel alignments</b>                             | <ul style="list-style-type: none"> <li>• Safety precautions.</li> <li>• Pre-alignment inspection.</li> <li>• Caster, camber and toe adjustment.</li> <li>• Steering wheel centering.</li> <li>• Rear wheel alignment.</li> <li>• After alignment problems.</li> </ul>   | 10 |
| 5. | <b>Servicing Wheels and tires</b>                   | <ul style="list-style-type: none"> <li>▪ Safety precautions.</li> <li>▪ Removing wheels from the vehicle.</li> <li>▪ Tire and tube repair.</li> <li>▪ Demounting and mounting tire from the rim.</li> <li>▪ Wheel balance.</li> </ul>   | 10 |
| 6. | <b>Servicing Anti-lock brake system (ABS)</b>       | <ul style="list-style-type: none"> <li>▪ Safety precaution.</li> <li>▪ Removing, inspection and installation of wheel speed sensors.</li> <li>▪ Removing, inspection and installation of vehicle speed sensors.</li> <li>▪ Removing, inspection and installation of hydraulic unit.</li> <li>▪ Removing, inspection and installation of brake pedal switch.</li> <li>▪ System fault diagnosis by using scan tools.</li> </ul> | 15 |
| 7. | <b>Servicing Traction control system (TCS)</b>      | <ul style="list-style-type: none"> <li>▪ Safety precaution.</li> <li>▪ Servicing electronic control unit.</li> <li>▪ TCS system fault diagnosis by using scan tools.</li> </ul>   | 8  |
| 8. | <b>Servicing Electronic stability program (ESP)</b> | <ul style="list-style-type: none"> <li>▪ Safety precautions.</li> <li>▪ Servicing electronic control unit.</li> <li>▪ TCS system fault diagnosis by using scan tools.</li> </ul>  | 8  |



**Evaluation Strategies:**

| Exams |             | Percentage | Date |
|-------|-------------|------------|------|
| Exams | First Exam  | 20%        |      |
|       | Second Exam | 20%        |      |
|       | Final Exam  | 50%        |      |
|       | Assignment  | 10%        |      |

**Teaching Methodology:**

- ❖ Workshop.

**References & Text Book**

Instructional Workshop Sheets

