

**Course Code :** ME 781

**Course Title :** Advanced Automotive Technology

**Credit Hours :** 3

### **Course Description**

An overview of the automotive industry and technology. Basic electronics and electricity, engine performance, diagnosis and service of the systems that directly affect the drivability of a vehicle. Sensing system and diagnosis devices theory and practice. Sensor errors and functions. Engine performance also include up-to-date and through discussion on OBDII and alternative fuels. Passenger comfort and Safety, laws governing the use of refrigeration system in vehicles. The theory of heating and air conditioning systems in a vehicle. Engine testing equipments, vacuum gauge test, cylinder power balance, cylinder compression test, ignition timing, exhaust gas CO and HC analyzer, oscilloscope engine and analyzer.

### **Course Objectives**

The student should be able to:

- Understand the basics and advanced principles of engine performance.
- Use modern diagnosis devices
- Analyze the electrical and electronic systems in vehicles.
- Become familiar with the engine test and equipments.

### **Course Topics**

Week no. 1: Introduction

Week no. 2: Basic overview of the automotive industry and technology

Week no. 3: Basic electronics and electricity.

Week no. 4: Basic electronics and electricity.

Week no. 5: Engine performance, diagnosis and service of the systems that directly affect the drivability of a vehicle.

Week no. 6: Engine performance, diagnosis and service of the systems that directly affect the drivability of a vehicle.

Week no. 7: 7<sup>th</sup> week evaluation.

Week no. 8: Engine performance, diagnosis and service of the systems that directly affect the drivability of a vehicle.

Week no. 9: Sensing system and diagnosis devices theory and practice.

Week no. 10: Sensing system and diagnosis devices theory and practice.

Week no. 11: Sensing system and diagnosis devices theory and practice.

Week no. 12: 12<sup>th</sup> week evaluation

Week no. 13: The theory of heating and air conditioning systems in a vehicle.

Week no. 14: The theory of heating and air conditioning systems in a vehicle.

Week no. 15: Presentation on selected topics.

Week no. 16: Final Examination

## References

- Robert Bosch GmbH, *Automotive Electrics; Automotive Electronics*, 4<sup>th</sup> ed., Automotive Technology, Germany, 2004
- Heisler, H, *Advanced Engine Technology*, Butterworth-Heinemann, UK, 2001
- Heisler, H, *Advanced Vehicle Technology*, 2<sup>nd</sup> ed., Butterworth-Heinemann, UK, 2001
- Robert Bosch GmbH, *Diesel-Engine Management*, Automotive Technology, Germany, 2004.
- Robert Bosch GmbH, *Gasoline-Engine Management*, Automotive Technology, Germany, 2004.
- Stone, R and Ball, J, K, *Automotive Engineering Fundamentals*, SAE, USA, 2004
- Erjavec, J, *Automotive technology*, 3<sup>rd</sup> Ed., Delmar Thomson, USA, 2000.
- Robert Bosch GmbH, *Automotive handbook*, 6<sup>th</sup> edition, Germany, 2004.