

## **AT8001 AUTOMOTIVE AIR-CONDITIONING**

### DETAILED SYLLABUS

#### **OBJECTIVE:**

- At the end of the course, the students will be able to understand the components of the automotive air-conditioning and their functions and the latest developments in this field.

#### **UNIT I AUTOMOTIVE AIRCONDITIONING FUNDAMENTALS**

Purposes of Heating, Ventilation and Air Conditioning- Environmental Concerns- Ozone layer depletion- Location of air conditioning components in a car – Schematic layout of a vehicle refrigeration system. Psychrometry – Basic terminology and Psychrometric mixtures- Psychrometric Chart- Related problems

#### **UNIT II AUTOMOTIVE COOLING AND HEATING SYSTEM**

Vehicle Refrigeration System and related problems- Fixed thermostatic and Orifice tube system- Variable displacement thermostatic and Orifice tube system- Vehicle air conditioning operation Types of compressor- Compressor Clutches- Compressor Clutch electrical circuit- Compressor lubrication- Condensers- Evaporators- Expansion devices- Evaporator temperature and pressure controls- receiver-drier- Accumulators- refrigerant hoses, Connections and other assemblies- Heating system

#### **UNIT III AIR-CONDITIONING CONTROLS, DELIVERY SYSTEM AND REFRIGERANTS**

Types of Control devices- Preventing Compressor damage- Preventing damage to other systems- Maintaining driveability- Preventing Overheating Ram air ventilation- Air delivery Components- Control devices- Vacuum Controls Containers – Handling refrigerants – Discharging, Charging & Leak detection – Refrigeration system diagnosis – Diagnostic procedure – Ambient conditions affecting system pressures.

#### **UNIT IV AUTOMATIC TEMPERATURE CONTROL**

Different types of sensors and actuators used in automatic temperature control- Fixed and variable displacement temperature control- Semi Automatic- Controller design for Fixed and variable displacement type air conditioning system

#### **UNIT V SYSTEM SERVICING AND TESTING**

Special tools for servicing vehicle air conditioning – Diagnosing components and air conditioning systems- Diagnosing cooling system- Air delivery system- Automatic temperature Control system diagnosis and service

#### **TEXT BOOKS:**

1. Warren Farnell and James D. Halderman, "Automotive Heating, Ventilation, and Air Conditioning systems", Classroom Manual, Pearson Prentice Hall, 2004

2. Warren Farnell and James D. Halderman, "Automotive Heating, Ventilation, and Air Conditioning systems", Shop Manual, Pearson Prentice Hall, 2004
3. William H Crouse and Donald L Anglin, "Automotive Air conditioning", McGraw Hill Inc., 1990.

**REFERENCES:**

1. Goings, L.F., "Automotive Air Conditioning", American Technical services, 1974.
2. Mitchell Information Services, Inc., "Mitchell Automatic Heating and Air Conditioning Systems", Prentice Hall Inc., 1989.
3. McDonald, K.L., "Automotive Air Conditioning", Theodore Audel series, 1978.
4. Paul Weisler, "Automotive Air Conditioning", Reston Publishing Co. Inc., 1990.