



## **INDIAN INSTITUTE OF TECHNOLOGY MANDI**

### **Course: Introduction to IC Engines**

#### **1. Introduction**

Classification of I.C. engine, Fundamental difference between S.I. and C.I. Engines, Comparison of two stroke and four stroke engines, various components, their functions, Types of efficiency, indicated and brake power, theory of carburetion, Air Standard cycles (Diesel, Otto, Dual, Stirling, Brayton) and their comparison, measurement and testing techniques. Measurement of Indicated power, brake power, fuel consumption.

#### **2. Combustion and control**

Thermodynamics of fuel-air cycles, real cycles, various losses in actual engines. Combustion processes in SI engine and its various stages, spark ignition, normal and abnormal combustion, knock pre-ignition, combustion stages in CI engines, ignition delay, types of combustion systems, Fuel spray behaviour, Exhaust emissions, its measurement and control, Thermochemistry of fuel air mixtures: combustion stoichiometry, first and laws of thermodynamics and combustion.

#### **3. Heat rejection and cooling**

Temperature distributions of various components, heat transfer theory, parameters effecting engine heat transfer, need and type of cooling systems

#### **4. Engine Performance and characteristics**

Engine performance characteristics (EPC), Variables affecting performance characteristics, Methods of improving EPC, Heat balance, Performance maps, turbochargers and superchargers.