ME801   **ADVANCED IC ENGINE SIMULATION**   **3-0-1-4**

Gas flow through four-stroke engines – The derivation of the particle velocity for unsteady gas flow-moving shock waves in unsteady gas flow-Motion of pressure wave in a pipe-heat transfer during pressure wave propagation-an introduction to reflection of pressure waves at a sudden area change-reflection of pressure waves in pipes for outflow from a cylinder. Discharge coefficient of flow within four-stroke engines

Combustion in four stroke engines –Modelling of four stroke engines-physical geometry required for an engine model-mechanical friction losses of four stroke engine-the thermodynamic and gad dynamic engine simulation. Empirical assistance for the designer of four stroke engines-empiricism for the design of cylinder head – intake system tuning-exhaust system tuning.Reduction of noise emission from four stroke engines.

Models will be developed for computational study of Single zone and Multi zone combustion models for SI engine and validation - droplet breakup, collision and wall interaction model. Prepare a computer code (Using any software like Matlab or open source software like Scilab) to simulate any stroke (i.e. Suction, Compression, Power or Exhaust) of Auto cycle.

TEXT BOOKS/REFERENCES:

1. Gordon P Blair, *"Design and Simulation of Four-Stroke Engine",* SAE-International Publication, 1999.
2. Ganesan. V, *"Computer Simulation of Spark Ignition Engine Process"*, Universities Press (I) Ltd, Hyderabad, 1996.
3. Ganesan. V, *"Computer Simulation of Compression Ignition Engine Process"*, Universities Press (I) Ltd, Hyderabad, 2000.
4. Ashley Campbell, *"Thermodynamic Analysis of Combustion Engines"*, John Wiley and Sons, New York, 1986.