Internal combustion engines

Finalità
The purpose is to present a based of the fundamental principles which govern internal combustion engines design and operation.

Programma
Engine types and their operation. Characteristic parameters: indicated work per cycle; mean effective pressure; brake torque; power; specific fuel consumption; efficiency; volumetric efficiency. Relations between performance parameters. Ideal models for engine cycles (Beau de Roches, Diesel, Sabathé). Combustion in spark ignition engines. Combustion in Diesel engines. Spark ignition engine fuel metering. Fuel injection systems for Diesel engine. Gas exchange process phenomena. Pollutants formation and control. Supercharging and turbocharging. Vehicle applications: hydrostatic transmissions. Description of mathematical models for the simulation of : Diesel engine; fuel injection Diesel engine; Spark ignition engines.

Attività d'esercitazione
Exercises with simulation models.

Modalità d'esame
The exam is based on an oral conversation.

Propedeuticità
Fluid machinery

Testi consigliati
G. Ferrari – Motori a combustione interna – Il Capitello