*The Porsche 911 Story, 7th edition, Paul Frere*

**Prerequisites:** *Thermo, Dynamics, Heat Transfer*

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<td>Homework : 2.1,3,4,5,8,9,10</td>
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<td>Spark Ignition Engines</td>
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<td>Tuning- Sensors, Optimization and ECU usage</td>
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<td>Heat Transfer, Turbulence</td>
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<td>Transmissions and Differentials,CV Joints, U-Joints, Etc.</td>
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<td>Case Study - Projects</td>
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<td>Finals</td>
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Grading:  
- **A**  
  - Midterm: 25%  
  - Final: 40%  
  - Homework: 10%  
  - Quiz/Part: 10%  
- **B**  
  - Midterm: 30%  
  - Final: 45%  
  - Homework: 10%  
  - Quiz/Part: 10%  

**Stone:** Internal Combustion Theory, Sone  
**Frere:** Porsche 911 Story, the Entire Development History
Engines Types and Definitions
4-Stroke - Ignition
   Induction
   Compression
   Expansion/Power
   Exhaust

What are the basic Components?
   Crankshaft
   Rod
   Piston/Cylinder/Block
   Valves
   Rockers/Lifters/Cam(s)
   Head
   Intake/Exhaust
   Fuel System
   Ignition

What are the basic Configurations?
Layouts
   Inline 4-5-6-8
   "V" 5-6-8-10-12
   "VR" 5,6
   Horizontal "Boxer" 4-6-8-10-12-16
   "W" and "H" configurations

Heads
   Flat Head
   "L" Head Pushrod
   Hemi-Head Pushrod
   Single Over Head Cam
   Double Overhead Cam
   Two Valve
   Three Valve
   Four Valve
   Five Valve

Cooling
   Water Cooled/Air Cooled/Oil Cooled/Combo

Compression (Diesel) engines

2-Stroke Engines
   Induction/Exhaust
   Compression/Expansion

Rotary Engines - Offset Essentially 2 moving parts LOUD and inefficient