ASSIGNMENT 3: ENGINE DYNAMICS ANALYSES [100 marks]

BMA3623/ENGINE DESIGN

DUE DATE: 28 APR 2017

1. Use the engine assigned to your group conduct engine dynamics analyses:
   a. Obtain the cylinder pressure vs crank angle profiles of the engines (using the excel file for IC engine). (20 marks)
   b. Plot Actual Gas torque vs. engine crank angle (20 marks)
   c. Plot Approximate Gas torque vs. engine crank angle (20 marks)
   d. Estimate the mass of each of the component by designing using Solidworks
      i. Piston mass
      ii. Conrod mass
      iii. Effective mass of the crankshaft (per-cylinder)
      (20 marks)
   e. Plot inertia torque vs. engine crank angle (20 marks)

Use the following references:

1. R.L. Norton, 2012. Design of Machinery: An Introduction to the Synthesis and Analysis of Mechanisms and Machines, McGraw-Hill Education; 5th edition.
2. Heywood, J. B. (1988). Internal Combustion Engine Fundamentals, McGraw-Hill International.
3. Willard W. Pulkrabek (2013),Engineering Fundamentals of the Internal Combustion Engine Pearson Education Limited; Pearson New International Edition edition

And the lecture notes given.