



Aditya College of Engineering & Technology

Aditya Nagar, ADB Road, Surampalem – 533437

Department of Mechanical Engineering

Academic Year: 2020-2021

Project Title:	THERMAL ANALYSIS AND OPTIMIZATION OF I.C ENGINE PISTON USING FINITE ELEMENT METHOD	
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Abstract	PO's Mapping	PSO's Mapping
The main objective is to investigate and analyze the thermal stress distribution of piston at the real engine condition during combustion process. In this work, the main emphasis is placed on the study of thermal behaviour of functionally graded coatings obtained by means of using a commercial code, ANSYS on aluminum and zirconium coated aluminium piston and Titanium Coated aluminium Pistons surfaces. The analysis is carried out to reduce the stress concentration on the upper end of the piston i.e (piston head/crown and piston skirt and sleeve). With computer aided design Solidworks software the structural	PO1, PO2, PO3, PO5, PO9, PO11	PSO1, PSO2, PSO3

model of a piston will be developed. Furthermore, the finite element analysis is done using Computer Aided Simulation Software ANSYS.		
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PO1: Engineering Knowledge	PO5: Modern Tool usage	PO9: Individual & Team Work
PO2: Problem Analysis	PO6: Engineer & Society	PO10: Communication Skills
PO3: Design & Development of solutions	PO7: Environment & Sustainability	PO11: Project Management & Finance
PO4: Investigations on complex problems	PO8: Ethics	PO12: Life Long Learning
PSO1: Mechanical Engineers must be able to analyze, design and evaluate mechanical components and systems using cutting-edge software tools as required by the industries from time to time.	PSO2: The ability to work in manufacturing and other sectors' operations and maintenance plants	PSO3: As part of a team or individually, plan and manage activities in micro, small, medium and large enterprises



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Relevance to PO's and PSO's

PO1	Applied the subject knowledge in calculation for design and systems
PO2	Studied and analysed existing designs of piston and piston rings
PO3	Structure of the cylinder is designed under simulation.
PO5	Solid works and Ansys workbench tools are used for design and simulation.
PO9	Design and Analysis is done by the team collaboration
PO11	Business plan contains the work flow and cost control
PSO1	Design and development of piston using Solid works and Ansys CFD
PSO3	Entrepreneur skills attained

