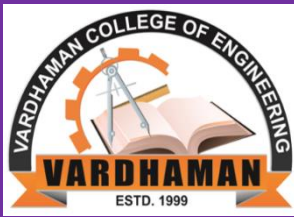


Vardhaman College of Engineering

Department of Mechanical Engineering

YANTRIK

News letter



Volume 11, Issue 1
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About the Department

Engineering advancements happening in the world's workshop, so with the standard of engineering consistently rising, mechanical engineering is creating ripples in the technology world.

The department is established in the year 2006 with an intake of 60 and the number is increased upto 90 in 2009 and 120 in 2013. The department is headed by Dr.B.Subbaratnam. Mechanical Engineering is a fast growing discipline in tune with the demands in the core areas of infrastructure and Manufacturing.

Vision of the Department

To be a premier center for producing competent mechanical engineers to cater the ever changing industrial demands and societal needs.

Mission of the Department

- To impart knowledge and skills in basic and applied areas of Mechanical Engineering through innovative learner-centric approach.
- To associate with industries and research organizations for gaining real time practical knowledge.
- To facilitate continuous learning based on dynamic needs of the society.

Program Educational Objectives (PEOs)

- Graduates make their way to the society with proper scientific and technical knowledge to identify, formulate and solve Mechanical Engineering problems.
- Graduates adapt to rapidly changing environment in the areas of Mechanical Engineering and explore possible profession in industry, academic, research and self-employment opportunities.
- Graduates excel in career by their team-working ability and communicate effectively to complete task with minimal resources.
- Graduates commit to professional and ethical practices encouraging diversity, continuous improvement and lifelong learning.

Program Specific Outcomes (PSOs)

- Demonstrate knowledge in the area of design, analysis and fabrication of mechanical systems.
- Apply learned concepts and management skills to associate professionally in industry or as an entrepreneur.

Student Articles

An approach for prediction of MOTORCYCLE ENGINE NOISE under combustion load

The engine is a major source of noise in a motorcycle since it is not enclosed. Engines have many sources of noise: intake, exhaust, piston slap, gear whine, valve train and combustion noise. Combustion noise is produced by a rapid rise of pressure, which is responsible for engine structural vibration. Combustion-induced vibrations are transferred from the powertrain to engine casings through the bearings and radiate noise. Noise radiated from the engine under combustion excitations is dominant in certain frequency range as compared to other engine noise sources. Engine noise control is always a challenge to designer due to the increased competition and customer demands in market for well optimized engine noise characteristics. The conventional approach of noise control is design-build-test-modify, but that is a time-consuming and iterative approach that involves considerable cost and design constraints, such as tooling to manufacture engine parts. Instead, structural, acoustics modeling and simulation methods can help designers to predict and control engine NVH performance at the product-development phase.

Approach

A vibro-acoustic approach to predict acoustic radiation of IC engine under combustion forces is divided into three stages: the first step is to carry out MBD simulation to determine excitation forces. Major components of the engine are modeled as flexible bodies and the effect of combustion pressure and inertia forces of moving parts is taken into account in this simulation, thus capturing the dynamics of the engine powertrain. The second step is to predict vibration response on the engine surface by carrying out a vibration analysis of the engine under combustion load. Forces obtained from MBD simulation are input to the finite element (FE) model of the engine. Accuracy of noise prediction depends on the accuracy of vibration analysis results. Thus, vibration analysis results at a few critical locations are compared with test results. The FE model is updated based on the vibration test data to achieve good correlation with actual testing. Learning obtained during the FE model updating process is generic and it can be applied to the development of FE model of any other engines in the design phase. Finally, acoustic analysis of the engine predicts Sound Pressure Level (SPL) at a specified distance from the engine and output of the vibration analysis of engine is used as input for the acoustic analysis. Noise correlation, is carried out by comparing analysis results with the test data for one- third octave bands of SPL. Sound intensity plots of the engine structure at critical frequencies are also compared. A flowchart summarizing the vibro-acoustic methodology is shown in Figure 1.

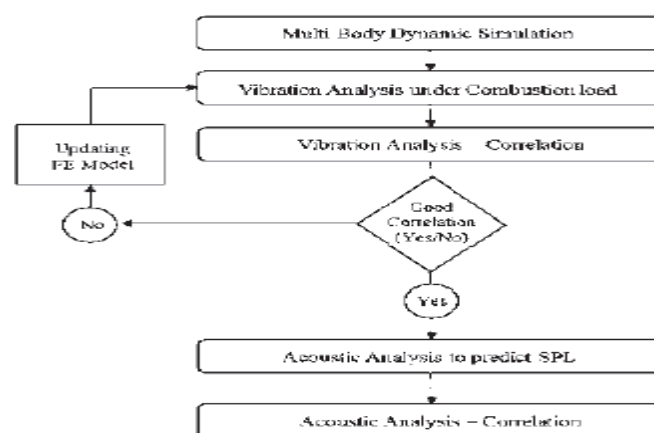


Fig 1: Vibro –acoustic methodology flow chart

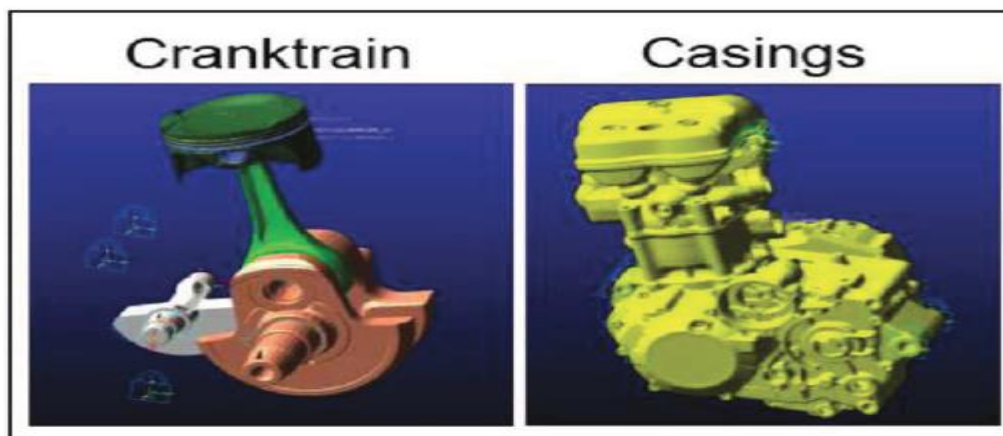


Fig 2: MBD Simulation model

Multi-body dynamic simulation

Multi-body dynamic simulation of the engine is performed, with flexible bodies of major components of the engine such as the crankshaft, connecting rods and casings considered to represent the engine dynamics. Crankshaft bearing stiffness is modeled in a 6×6 stiffness matrix in order to capture accurate transmissibility of combustion forces from crankshaft to casings. The bearing-stiffness calculation and its effect on vibration transmissibility is explained in detail in the later section. Figure 2 shows the model for MBD simulation. The forces and moments acting on the crankshaft bearings and piston side thrust force are computed through MBD simulation. These forces and moments are converted to frequency domain by using FFT and used as an input for vibration analysis. It is observed that the force magnitude decreases exponentially with respect to the frequency. Forces due to combustion excitation are more dominant till 1000 Hz. Forces have comparatively less magnitude in the frequency range of the 1000 Hz to 2000 Hz frequency range and the forces are negligible above 2000 Hz.

CO-CURRICULAR ACTIVITIES ATTENDED

S No	Name of the Event	Venue	Date	No of Students Participated
1	ATV Design Challenge 2016	Auto sports India, Bhubaneswar, Odisha.	4 th To 7 th March-2016	2
2	Virtual BAJA SAEINDIA2016	Christ University, Bengaluru	24 th & 25 th June-2016	46

EXTRA-CURRICULAR ACTIVITIES ORGANIZED

S No	Name of the Event	Venue	Date	No of Students Participated
1	FOOT BALL	VARDHAMAN COLLEGE OF ENGINEERING	14 th & 15 th March 2016	15
2	VOLLEY BALL	VARDHAMAN COLLEGE OF ENGINEERING	14 th & 15 th March 2016	10
3	THROW BALL	VARDHAMAN COLLEGE OF ENGINEERING	14 th & 15 th March 2016	10
4	BASKET BALL	VARDHAMAN COLLEGE OF ENGINEERING	14 th & 15 th March 2016	7

5	KHO-KHO	VARDHAMAN COLLEGE OF ENGINEERING	14 th & 15 th March 2016	11
6	SHUTTLE	VARDHAMAN COLLEGE OF ENGINEERING	14 th & 15 th March 2016	4
7	CRICKET	VARDHAMAN COLLEGE OF ENGINEERING	14 th & 15 th March 2016	15
8	CHESS	VARDHAMAN COLLEGE OF ENGINEERING	14 th & 15 th March 2016	20
9	CARROMS	VARDHAMAN COLLEGE OF ENGINEERING	14 th & 15 th March 2016	25

FACULTY RESEARCH PUBLICATIONS: (JOURNALS)

SI No-	Manuscript Title
1	Reddy,S.Maruthi Gangadhar , Optimization of Process Parameters for Tungsten Inert Gas Welding of AISI 316L using CaCl ₂ and TiO ₂ as flux Materials,2016, International Journal of Current Engineering and Technology, Vol-6 (2) pp. 768-770.
2	Sreedhar Vulloju , K. Krishna Reddy, Md. Arif, Design and Analysis of Performance of Energy Converter, 2016, International Journal of Engineering and Management Reserch, Vol-6(3), pp.638-643.
3	T. V Sessaiah Naidu and V. Pandurangadu, Characterization and evaluation of thermal properties of a nano lubricant by the addition of MOS ₂ nanoparticles, Technical organization India, 2016, Vol-2(2), pp.42-46.
4	M.Vishnu Vardhan , G.Sankaraiah , M.Yohan , Experimental Study of Parameters of P-20 Steel on CNC milling machine using Taguchi's Orthogonal Array,2016, International Journal of Engineering Technology, Management and Applied Sciences, Vol-4(4),pp. 305-311.

Faculty Research Publications : Conferences

SI No-	Manuscript Title
1	K Deepak , A.V.S.S.K.S. Gupta, "Performance Augmentation of Low Temperature Kalina Cycle System", International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT-2016), DMI College of Engineering, Chennai, 3-5 March, 2016.
2	K Deepak , A.V.S.S.K.S. Gupta, "Modeling and Analysis of Low Temperature Kalina Cycle System" International Conference on Civil, Mechanical and Environmental Engineering Technologies (ICCMEET-2016), S.V.S. College of Engineering , Coimbatore, 26-27 February, 2016.
3	B.Venkaatesh and K.Sriker "Wear behavior of multilayer over single layer of Fe-C-Cr hardfacing alloy on ASTM A 105 steel" International Conference on Advanced Materials and Applications (ICAMA-16) Organized by BMS College of Engineering, Bangalore, India, during 15-17 June, 2016. Published in Materials Today: Proceeding(2016).
4	B.Venakatesh , and P.Ravitej, "Property Evaluation of Superhard Alloys" International Conference on Futuristic innovations in Mechanical Engineering and Manufacturing Engineering and Manufacturing Management (ICFIMEMM-2016) Organized by Department of Mechanical Engineering, M.Kumarasamy college of Engineering, Thalavapalayam, Karur during 30th-31st, March 2016.

Participation of Faculty in FDP/STTPs/Workshops/Guest Lectures

S. No	Name of faculty	Title of Event	Seminar/FDP STTPs/ Workshop Attended	Venue	Period	No. of Days	Faculty Attended	Relevance Of Training Program
1.	G.Venkatesh	Research Methodology & Technical paper writing	Work shop	Sree Vidyanikaten Engineering College – Tirupathi	26 th -27 th Jun, 2016	02	01	Research Methodology
2.	E.Manoj Kumar	Material Design an Engineering Challenge	FDP	Vardhaman College of Engineering, Hyderabad	13 th -17 th Jun, 2016	05	30	Material Science
3.	P.Rama Krishna Reddy	computational fluid dynamics & applications in Engineering	Work shop	JNTUH	19 th -21 st Jan2016	03	01	CFD
4.	V.Anil Kumar	computational fluid dynamics & applications in Engineering	Work shop	JNTUH	19 th -21 st Jan2016	03	01	CFD
5.	E.Manoj Kumar	computational fluid dynamics & applications in Engineering	Work shop	JNTUH	19 th -21 st Jan2016	03	01	CFD
6.	S Naresh Kumar	computational fluid dynamics & applications in Engineering	Work shop	JNTUH	19 th -21 st Jan, 2016	03	01	CFD

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7.	G.Ravi Chandra	Advance ments in MEMS and NEMS Technolo gies	FDP	GRIET-Hyderabad	19 th -21 th Nov, 2016	03	01	Mechatron ics
8.	M Vishnu Vardhan	Advance ments in MEMS and NEMS Technolo gies , 19 th -21 th Nov, 2016	FDP	GRIET-Hyderabad	19 th -21 th Nov, 2016	03	01	Mechatron ics
9.	K Sai Ram	Advance ments in MEMS and NEMS Technolo gies , 19 th -21 th Nov, 2016	FDP	GRIET-Hyderabad	19 th -21 th Nov, 2016	03	01	Mechatro nics
10	D V Ramana Reddy	Advance ments in MEMS and NEMS Technolo gies , 19 th -21 th Nov, 2016	FDP	GRIET-Hyderabad	19 th -21 th Nov, 2016	03	01	Mechatron ics
11	Ch Chandra Mouli	Advance ments in MEMS and NEMS Technolo gies , 19 th -21 th Nov, 2016	FDP	GRIET-Hyderabad	19 th -21 th Nov, 2016	03	01	Mechatron ics

Editorial Members

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TECHNICAL EDITOR	Dr. B. Venkatesh
LITERATURE EDITOR	Mr. E. Manoj Kumar
GENERAL SECRETARY	Mr. D. V. Ramana Reddy
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