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DEPARTMENT OF MECHANICAL ENGINEERING

Top up Lecture on 'Experimental Techniques of Dynamic Systems'

This top up Lecture on 'Experimental Techniques of Dynamic Systems' was conducted on 28th February 2019, at MVJ College of Engineering - Seminar Hall 4.

The topics of Simulation and Experimental Modeling were dealt with, at this Lecture. Experimental Techniques of Dynamic Systems workshop is based on a method for direct estimation of physical parameters in dynamic systems. Compared with classical system identification, this method appears to be easier to understand, apply, and combine with physical insight. It is based on a sensitivity approach that is useful for choice of model structure, for experiment design, and for accuracy verification.

Top Up Lecture on 'Experimental Techniques of Dynamic Systems', organized by Department of Mechanical Engineering, at Seminar Hall 4, on 28th February 2019. The Resource Person, Mr. Kunal from Mercedes Benz, presenting an introduction to the topic.

The Seminar started at 8:15 am with the welcoming of the Resource Person Mr Rohit Rajpal, Engineer, UTC Aerospace Bangalore and Mr Kunal Gurjar, Engineer, Mercedes Benz Bangalore by the Head of Department of Mechanical Engineering and staff of the Mechanical Engineering Department. The students of Final year Mechanical Engineering and faculty from the Department were the participants in the event.

At the outset, Mr. Rohit from UTC Aerospace explained about the basic concepts of vibration. He took the example of the wing of an aircraft which acts as a cantilever beam, and went on to describe the different types of analysis done on it like:

- Free vibration Analysis
- Harmonic Analysis
- Model Analysis
- Sine Sweep testing
- Arbitrary Excitation

The Speaker introduced the participants to many exclusive examples and challenges in the world of vibration. Then, he emphasized on the need for additional knowledge on the following devices, for practical implementation - Actuators to excite the system (Motor with unbalance mass, Shakers etc.), Sensors to measure the response (Accelerometer, Laser pickup, Vibro-meter), Signal Processing techniques (Filters, FFT etc.), Interface (eg. Arduino, R-pi), Controller: PID.

Top Up Lecture on 'Experimental Techniques of Dynamic Systems' organized by Department of Mechanical Engineering. The Resource Person Mr. Rohit from UTC

Aerospace explaining to the students, the concepts of how data can be acquired from the experiment through a setup for analysis.

Top Up Lecture on 'Experimental Techniques of Dynamic Systems' organized by Department of Mechanical Engineering. The Resource Person Mr. Rohit is in discussion with the students of the eighth semester.

Then Mr. Kunal explained about what the current requirement in industry is and how students need to keep themselves ready for the industry job. What is the importance of the vibration workshop? How does it help students to enhance their knowledge? What does Industry expect from a fresher? What is the Industrial definition of an Engineer? What should one focus on to get his dream job? How will experiential learning make us better engineers? All these questions were clearly tackled, with lucid explanations.

Top Up Lecture on 'Experimental Techniques of Dynamic Systems' organized by Department of Mechanical Engineering. The Resource Person Mr. Kunal from Mercedes Benz addressing the students about Industry requirements.

Top Up Lecture on Experimental Techniques of Dynamic Systems' organized by Department of Mechanical Engineering. The Resource Persons Mr. Kunal and Mr. Rohit discussing on the experimental techniques in dynamic system.

Later, he explained about the Workshop that the students will be engaged in, with hands-on demonstration of dynamic system, wherein they will get total clarity on various concepts of dynamic systems, such as:

- What is the difference between static and dynamic system?
- Why is it important to critically study dynamic systems? What is Noise vibration and harshness (NVH)? Can I experimentally measure sound and vibration?
- What is natural frequency? How do I calculate it experimentally and numerically?
- What is forced and free vibration test?
- Which sensors and actuators are used to conduct free and forced vibration test?
- What is Damping? What are the various techniques to calculate damping of dynamic systems?
- What is modal analysis? How is this technique the most important technique to find resonant frequencies?
- How to design a robust system: Introduction to control system.

Top Up Lecture on 'Experimental Techniques of Dynamic Systems' organized by Department of Mechanical Engineering. The Resource Persons Mr. Kunal and Mr. Rohit discussing the concept of harmonic analysis and the data acquisition system in vibration using interfacing elements.

At the end of the session, the students gave their feedback on the event, in a Feedback form.

Top Up Lecture on 'Experimental Techniques of Dynamic Systems' organized by Department of Mechanical Engineering, Students giving feedback regarding the event in feedback forms.

Outcome of the Event:

1. Students understood the basic concepts of dynamics systems.
2. Students got an idea about the Workshop which is going to be conducted in May 2019.