



Politecnico
di Torino

PH.D. IN MECHANICAL ENGINEERING
COURSE III LEVEL

FACING THE TRANSITION FROM CONVENTIONAL TO DECARBONIZED/ELECTRIC POWERTRAINS FOCUSING ON NVH SIMULATION



SPEAKER



Dr. Tigran Parikyan

Principal Development
Engineer' AVL List
GmbH

PROGRAM

CONTENT

The course aims to explore simulation techniques for the dynamic behaviour of automotive powertrains, with particular emphasis on the new challenges introduced by their progressive electrification. Different modelling methodologies, available in the commercial AVL Excite software, will be illustrated depending on the product development phase, ranging from 3D models to equivalent 1D torsional models. Examples of industrial applications concerning the vibro-acoustic behaviour of thermal, hybrid and electrically powered vehicles will be shown.

Course Plan

LECTURE 1

TUE 6 MAY 2025 – FROM 9 AM TO 1 PM – 3RD FLOOR MEETING ROOM (DIMEAS)

- Introduction
- Engineering tasks in simulation of dynamics and NVH of ICE (Internal Combustion Engine), HEV (Hybrid Electric Vehicles) and BEV (Battery Electric Vehicles) powertrains
- Dynamic models of crankshaft, other ICE parts, and parts of BEV powertrains

LECTURE 2

WED 7 MAY 2025 – FROM 2 PM TO 6 PM – 3RD FLOOR MEETING ROOM (DIMEAS)

- 3D dynamic analysis of ICE and BEV powertrains in time and frequency domains

LECTURE 3

FRI 9 MAY 2025 – from 2pm to 6pm – ground floor meeting room (DIMEAS)

- Dynamic analysis of engine mounts in ICE and BEV powertrains
- Assessment (multiple choice questionnaire)
- Final remarks



6 – 9 May 2025



DIMEAS
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