Cinématique et dynamique des machines

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INTRODUCTION

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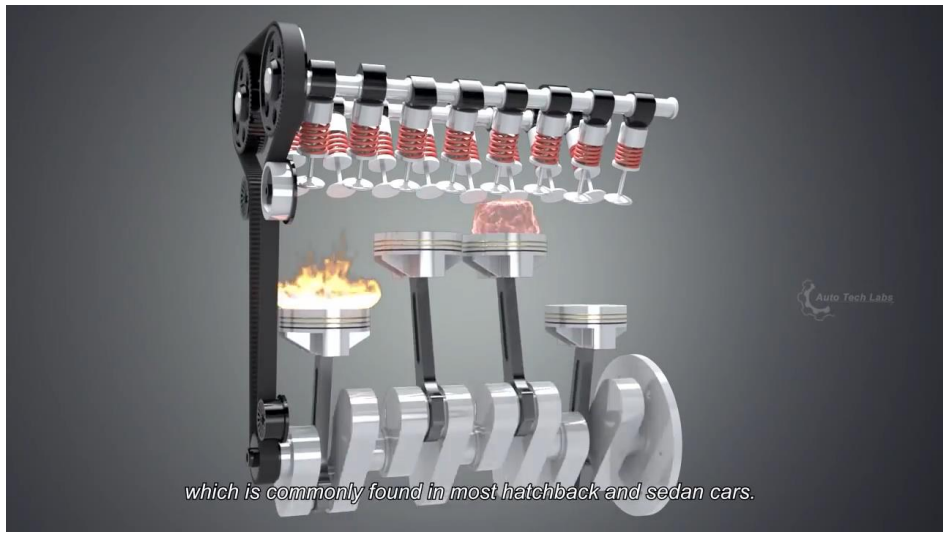
Piston engine



https://www.youtube.com/watch?v=DKF5dKo_r_Y

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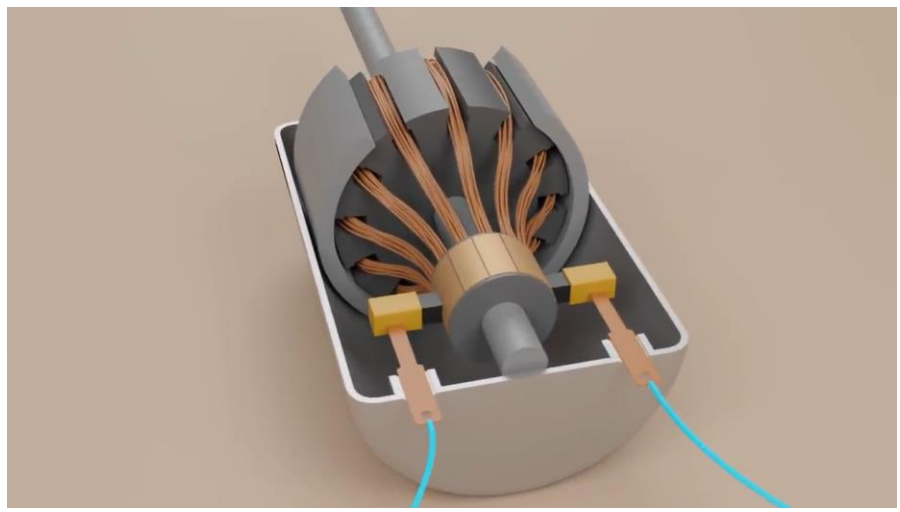
Electric engine



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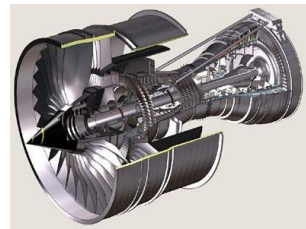
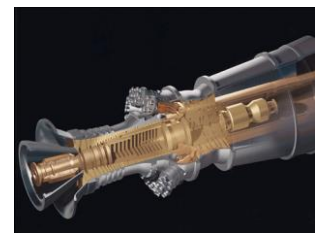
Rotor dynamics

Wind turbine

Turbo-reactor



Gas turbine



[wikipedia.org]

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Machine vibrations

Motion → Dynamics forces → Vibrations

↓

Uncomfort
Noise
Fatigue
Damage …

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COURSE CONTENT AND ORGANISATION

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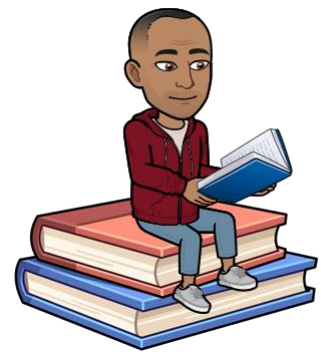
Course content

- Basics of kinematics
- Basics of dynamics
  - Dynamic equations
  - One-degree-of-freedom system
  - Two-degree-of-freedom system
- Applications
  - Vibration isolation
  - Tuned mass damper
  - Jefcott rotor



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Course organisation

Theory

- 12/11: Kinematics / Newtonian Dynamics
- 26/11: Lagrange equations
- 3/12: One degree of freedom systems
- 10/12: Isolation / Two degrees of freedom system
- 17/12: Jeffcott rotor

Exercises

- 30/11, 7/12, 14/12

Slides available at
https://arnoresearch.com/cinematique-et-dynamique-des-machines-2021-2022/ 9

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Evaluation

- Written exam in January :
  - Theory (50 %)
    - List of questions will be published in December
  - Problems (50 %):
    - Similar to problems from exercise sessions

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Questions ?

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