


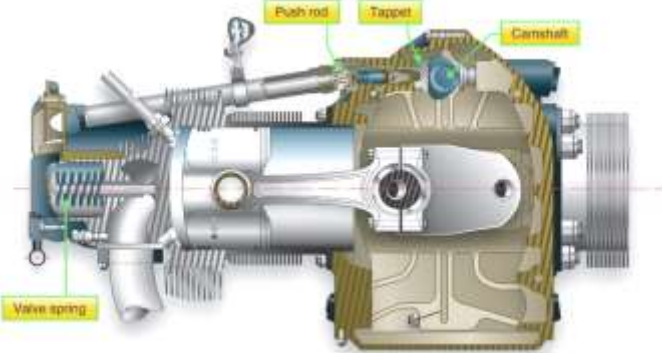
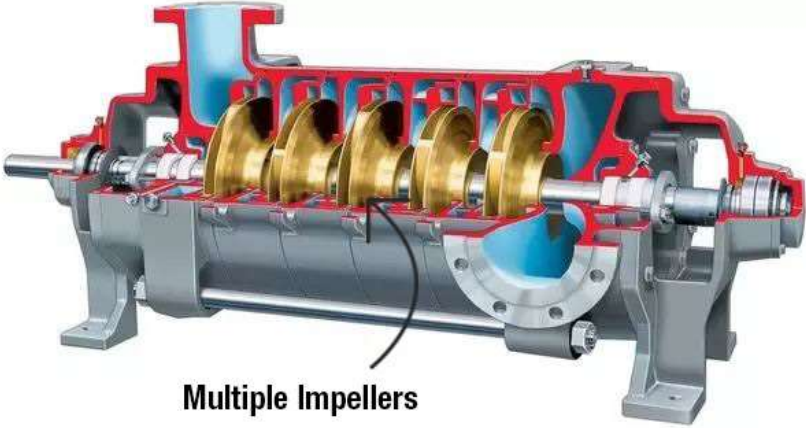


**Unit Wise Real Time Applications/Live Examples**

**Department: Mechanical Engineering Semester: I Academic Year: 2024-25**

**Class: BE Div: A**

**Course: Dynamics of Machinery**

Unit No. -Name	Real life Applications
UNIT 1: Balancing	
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UNIT 1: Balancing	 <p><b>Multiple Impellers</b></p>





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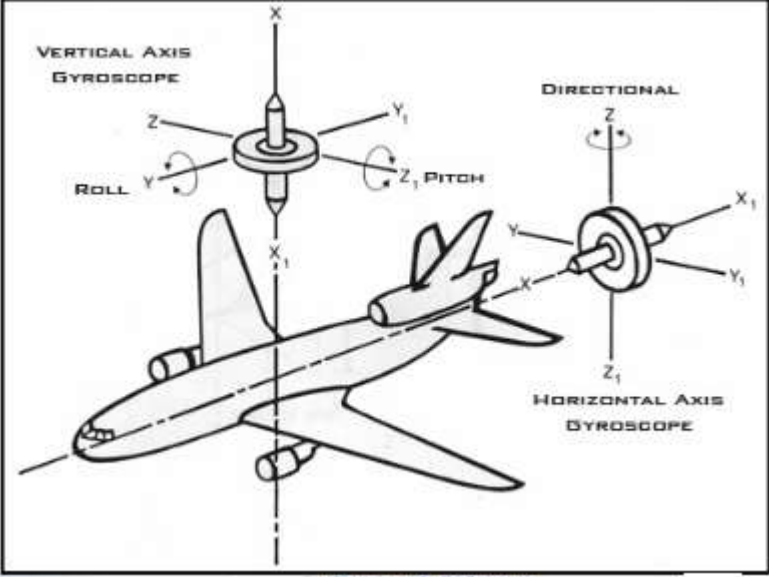

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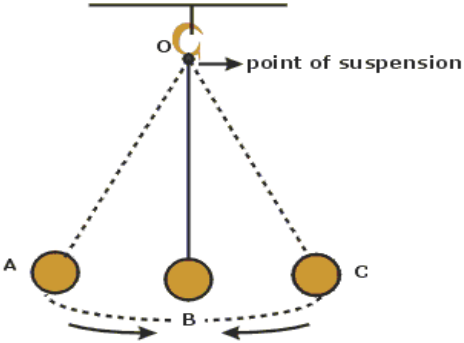

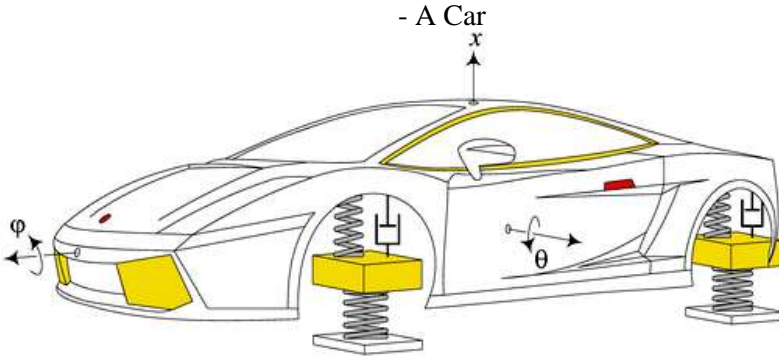
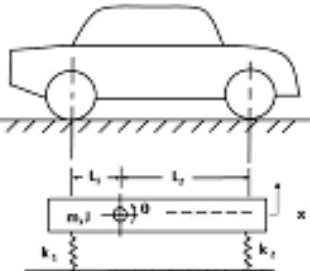
Revision: **00**

Date: **01/04/2021**

Unit No. -Name	Real life Applications
<p><b>UNIT 1: Balancing</b></p>	<p style="text-align: center;"><b>4 Cylinder</b></p>  A detailed 3D CAD model of a 4-cylinder inline engine's internal components. It shows the crankshaft, connecting rods, pistons, and valves. A timing belt is visible on the left side. The text '4 Cylinder' is written in red above the model.
<p><b>UNIT 1: Balancing</b></p>	 A photograph of a vintage Birmingham Ltd engine. It is a two-cylinder engine with a cast iron block and two cooling fins on each cylinder head. The text 'BIRMINGHAM LTD BIRMINGHAM' is visible on the side of the engine block.

**Course faculty**

Unit No. -Name	Real life Applications
<p>UNIT 2: Gyroscope</p>	 <p>The diagram illustrates the application of gyroscopes in an aircraft. It shows a 'VERTICAL AXIS GYROSCOPE' with a vertical axis labeled 'X'. The aircraft's roll is indicated by rotation around the 'Y' axis, and its pitch is indicated by rotation around the 'Z' axis. A 'DIRECTIONAL GYROSCOPE' is also shown, with its vertical axis labeled 'Z<sub>1</sub>' and its horizontal axis labeled 'X<sub>1</sub>'. The aircraft's own axes are labeled 'X', 'Y', and 'Z'. The diagram is captioned 'Gyroscopic Reference'.</p>
<p>UNIT 2: Gyroscope</p>	 <p>A photograph of a white motorboat on the water. The boat has 'SEAKEEPER' and 'THINK A BIG, BE ADISED.' written on its side. It is equipped with a black outboard motor at the stern and a white cabin structure.</p>

Unit No. -Name	Real life Applications
<p><b>UNIT 3: Single Degree of Freedom Systems – Free Vibration</b></p>	<p align="center">Single degree of freedom system- Pendulum</p> 
<p><b>UNIT 3: Single Degree of Freedom Systems – Free Vibration</b></p>	<p align="center">musical instruments, vibrating screens, shakers, conveyers, dryers</p> 
<p><b>UNIT 3: Single Degree of Freedom Systems – Free Vibration</b></p>	<p align="center">Physical Systems and Physical Models - A Car</p> 
<p><b>UNIT 3: Single Degree of Freedom Systems – Free Vibration</b></p>	<p>Model with Two Degrees of Freedom - Pitching Included in the Model</p> 





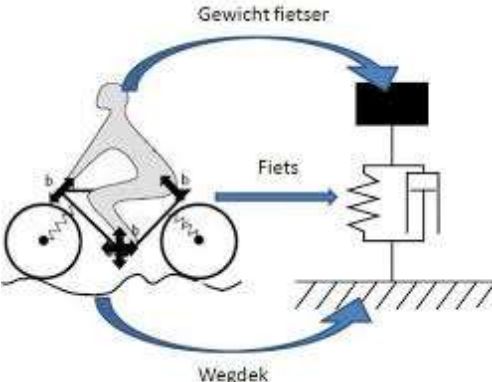

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Record No.: ZCOER-ACAD/R/16H

Revision: 00

Date:01/04/2021

Unit No. -Name	Real life Applications
<p align="center"><b>UNIT 3: Single Degree of Freedom Systems – Free Vibration</b></p>	<p align="center">Physical Systems and Physical Models - A Bicycle</p> 
<p align="center"><b>UNIT 3: Single Degree of Freedom Systems – Free Vibration</b></p>	<p>Transverse Vibrations - mass moves perpendicular to the axis of a beam (or a spring). Restoring force comes from the flexural rigidity of the beam like structures that resist bending.</p> 

Course faculty



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Record No.: ZCOER-ACAD/R/16H

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Date: 01/04/2021

Unit No. -Name	Real life Applications
<b>UNIT 4: Single Degree of Freedom Systems - Forced Vibrations</b>	<p>Deterministic Forcing Function-A Car Passing Over a Half Sinusoidal Bump</p>
<b>UNIT 4: Single Degree of Freedom Systems - Forced Vibrations</b>	<p>Force Excitation-The vibrations of SDOF system due to external harmonic force (Forced Vibrations due to Force Excitation)</p>
<b>UNIT 4: Single Degree of Freedom Systems - Forced Vibrations</b>	<p>forced vibrations due to rotating Unbalance</p>
<b>UNIT 4: Single Degree of Freedom Systems - Forced Vibrations</b>	<p>Reciprocating masses like piston of an IC engine cause unbalance forces – Reciprocating unbalance</p>
<b>UNIT 4: Single Degree of Freedom Systems - Forced Vibrations</b>	<p>Critical Speed of Shaft (Whirling Speed)</p>



Unit No. -Name	Real life Applications
<p><b>UNIT 5: Two Degree of Freedom Systems – Undamped Vibrations</b></p>	<p><b>Two Degree of Freedom Systems - Bicycle</b></p>
<p><b>UNIT 5: Two Degree of Freedom Systems – Undamped Vibrations</b></p>	<p>There are two masses connected with three springs as shown. Let masses be constrained to move only in vertical direction</p>
<p><b>UNIT 5: Two Degree of Freedom Systems – Undamped Vibrations</b></p>	<p><b>Two DOF systems – Torsional systems</b></p> <p>There are two rotors mounted on a shaft and the shaft is considered fixed at both ends</p>







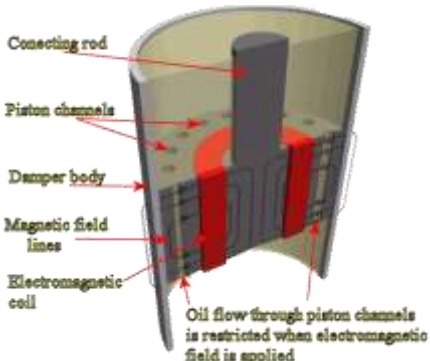
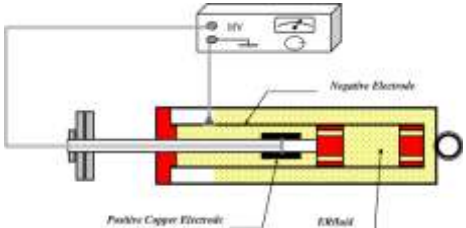
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Revision: 00

Date:01/04/2021

Unit No. -Name	Real life Applications
<p><b>UNIT 6: Measurement and Control of Vibration</b></p>	<p>Vibration of the aircraft due to jet noise - Designing the outlet of exhaust gases from turbine properly. Jet noise causes vibrations of fuselage</p> <div style="display: flex; justify-content: space-around;">   </div>
<p><b>UNIT 6: Measurement and Control of Vibration</b></p>	<p>Minimizing vibration of chimneys due to wind</p> <div style="display: flex; justify-content: space-around;">   </div>
<p><b>UNIT 6: Measurement and Control of Vibration</b></p>	<p><b>Magneto-Rheological Dampers</b></p> 
<p><b>UNIT 6: Measurement and Control of Vibration</b></p>	<p><b>Electro-Rheological Dampers</b></p> 





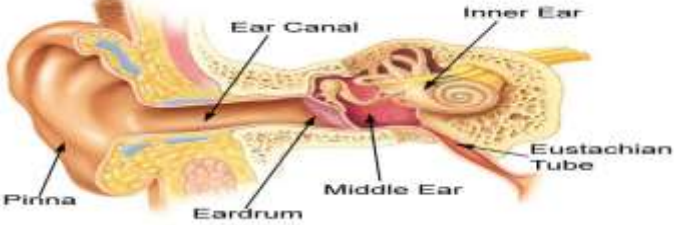



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Unit No. -Name	Real life Applications
<p><b>UNIT 6: Introduction to Noise</b></p>	<p align="center">Human Hearing system</p> 
<p><b>UNIT 6: Introduction to Noise</b></p>	<p align="center">SOURCES OF SOUND</p> 
<p><b>UNIT 6: Introduction to Noise</b></p>	<p align="center">SOUND NEEDS A MEDIUM TO PROPOGATE</p> 
<p><b>UNIT 6: Introduction to Noise</b></p>	<p align="center">Sound Level Meters</p> 

Course faculty