

CONTENTS

Each chapter is a separate pdf file and can be quite large (1.5 MB). There are links to animation programs from within the chapters. A [list of the programs](#) is available with links to run the programs.

[Introduction](#): This discusses the importance of vibration and introduces the animation programs, equilibrium position and degrees-of-freedom.

[Chapter 1](#): One degree-of-freedom vibration.

This covers simple vibration theory and introduces many of the terms and concepts that are used in more complex vibration situations

[Appendices](#): Newton's second law; Free body diagrams; Gravity effects; Phase.

[Chapter 2](#): Two degree-of-freedom vibration.

This extends vibration theory and introduces the concepts of modes of vibration and illustrates some methods for reducing vibration.

[Chapter 3](#): Beam on springs

This is another example of a two degree-of-freedom system that includes rotation as well as translation. Together with the axial system considered in chapter 2 it provides useful illustrations for the next chapter.

[Chapter 4](#): Analysis methods

A variety of methods that are used for finding natural frequencies and mode shapes is presented.

[Chapter 5](#): Multi degree-of-freedom vibration.

The analysis of systems with increasing numbers of degrees-of-freedom is presented.

[Chapter 6](#): Modal analysis.

The use of modal characteristics to find transient and steady state solutions.

[Chapter 7](#): Continuous systems

The axial and torsional vibration of beams is presented.

[Chapter 8](#): Continuous systems

The transverse vibration of beams is presented.

[Chapter 9](#): Receptances - a systems approach

The systems approach is useful in gaining understanding and finding solutions. It allows a building block approach to generate complex systems.

[List of programs](#):