Design of Machine Elements I - Video course

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Design philosophy
Design-A decision-making process
Machine design
Design of machine elements
Design principle
Lecture-2
Design Procedure
Types and considerations.
Stochastic design principles
Lecture-3
Engineering Materials
Classification and properties
Lecture-4
Engineering Materials
ISO codes.
Module-2
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Stresses in Machine Elements
Types of simple stresses
State of stress at point-implications
Lecture-6
Stresses in Machine Elements
Principal stresses
Compound stresses in machine parts
Module-3
Lecture-7
Design for strength
Static loading
Theories of failures
Allowable stress
Factor of safety
Lecture-8
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Strain components
Stress-strain relationship
Lecture-9
Stress concentration factor
Stress intensity factor
Lecture-10
Design for variable loading
Fluctuating stresses
Fatigue failure
Strain and stress life
Endurance limit
Fatigue strength
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Fatigue strength and design
Modified Goodman diagram
Gerber Line
Soderberg line
Lecture-12
Design for combined fatigue loading

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Mechanical Engineering

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Types and uses
Design of pin joints
Lecture-14
Fasteners
Design of cotter and knuckle joints
Lecture-15
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Flange couplings
Rigid and flexible
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Thread forms
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Lecture-19
Threaded fasteners
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Power screws
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Rivets
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Riveted joints
Types and efficiency
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Strength of welded joints

Lecture-25
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Lecture-26
Eccentric loading of riveted, welded and bolted joints
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Module-7

Lecture-27
Mechanical Springs
Helical springs
Stresses and Deflection

Lecture-28
Helical Springs

Stresses and deflection
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Lecture-29
Leaf springs
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General design principles

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Levers
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Lecture-32
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Static loading: stresses
Design principle

Lecture-34 Shafts
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Lecture-35 Shafts
Design principle for fatigue loading

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Lecture-36 Thin cylinders
Stresses

Lecture-37 Thick cylinders
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Thick cylinders
Stresses due to internal and external pressures

Lecture-38 Thick cylinders
Design methodology for enhanced pressure