NPTEL Video Course - Mechanical Engineering - Micro and Smart Systems

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Co-ordinating Institute - IISc - Bangalore

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Glimpses of Microsystems
Lecture 2 - Smart Materials and Systems
Lecture 3 - Microsensors
Lecture 4 - Microactuators
Lecture 5 - Microsystems
Lecture 6 - Smart systems Application and Structural Health Monitoring
Lecture 7 - Microfabrication Technologies
Lecture 8 - Thin-film Materials and their Deposition
Lecture 9 - Approaches for Pattern Transfer
Lecture 10 - Surface Micromachining of Microstructures
Lecture 11 - Bulk Micromachining of Microsystems
Lecture 12 - Extended Approaches for Working Microsystems
Lecture 13 - Non-conventional Approaches for Microsystems
Lecture 14 - Packaging of Microsystems
Lecture 15 - Deformation Strains and Stresses
Lecture 16 - Microdevice Suspensions
Lecture 17 - Residual Stress and Stress Gradients
Lecture 18 - Torsion and Twist
Lecture 19 - Vibrations of Microsystems Devices
Lecture 20 - Vibrations of Microsystems Devices
Lecture 21 - Micromachined Gyroscopes
Lecture 22 - Modelling of Coupled Electrostatic Microsystems
Lecture 23 - Coupled Electrothermal-elastic Modelling
Lecture 24 - Modelling of Microsystems
Lecture 25 - Finite Element Method and Microsystems
Lecture 26 - Theoretical Basis for the Finite Element Method
Lecture 27 - Energy Theorems and Weak Form of the Governing Equation
Lecture 28 - Finite Element Equation Development and Shape Functions
Lecture 29 - Isoparametric FE Formulation and some Examples

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Lecture 30 - Finite Element for Structures with Piezoelectric Materials
Lecture 31 - Semiconductor Device Physics
Lecture 32 - BJT and MOSFET Characteristics and Op-Amps
Lecture 33 - Op-Amp Circuits and Signal conditioning for Microsystems Devices
Lecture 34 - Control and Microsystems
Lecture 35 - Vibration Control of a Beam
Lecture 36 - Signal Conditioning Circuits and Integration of Microsystems and Microelectronics
Lecture 37 - Pressure Sensor Design Concepts, Processing, and Packaging
Lecture 38 - Pressure Sensor Design Concepts, Processing, and Packaging
Lecture 39 - Pressure Sensor Design Concepts, Processing, and Packaging
Lecture 40 - Capacitive Micro-accelerometer
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