

Mechatronic Components: Roadmap to Design

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- 1. Mechatronics: A Brief History**
- 2. Use of This Book: Roadmap to Design**
- 3. Calculation of Mechanical Properties**
 3. 1. Calculation for Friction
 3. 2. Calculation for Center of Gravity
 3. 3. Calculation for Moment of Inertia
 3. 4. Calculation for Flow
- 4. Mechanical Failure Modes**
 4. 1. Bending
 4. 2. Shear
 4. 3. Torsion
 4. 4. Buckling
 4. 5. Fatigue
 4. 6. Creep
 4. 7. Thermal Shock
- 5. Materials Properties**
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 5. 2. Plastic Types and Features
 5. 3. Steel Types
 5. 4. Titanium Types
 5. 5. 3D Filament Types
 5. 6. 3D Material Types
 5. 7. Materials in Machine Design
- 6. Manufacturing Processes**
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 6. 3. Drilling
 6. 4. Forming Press
 6. 5. Shearing Process
 6. 6. Extrusion
 6. 7. Surface Finishing Methods
 6. 8. Electro Discharge Machining
 6. 9. Casting
 6. 10. Sintering
 6. 11. Rolling
 6. 12. Forging
 6. 13. Forging Process
 6. 14. Injection

- 6. 15.Hot End / Nozzle Design Procedure
- 6. 16.Motion Mechanisms for 3D Printers
- 6. 17.CNC Axis

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- 7. 1. Mechanical Power Transmission Types
- 7. 2. Gears
- 7. 3. Belts
- 7. 4. Bolts
- 7. 5. Mechanical Keys
- 7. 6. Cam Mechanism
- 7. 7. Brakes and Clutches

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- 8. 1. Drawing Programs
- 8. 2. Meshing
- 8. 3. FEA Programs
- 8. 4. CAM Programs
- 8. 5. Circuit Drawing Programs

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- 9. 4. Soldering
- 9. 5. Adhesive Bonding
- 9. 6. Additive Manufacturing

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- 10. 2.Capacitors
- 10. 3.Resistors
- 10. 4.Electronic Flow Control
- 10. 5.Operational Amplifiers
- 10. 6.Logic Operations
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- 10. 8.Multimultiplexers
- 10. 9.Bridge Circuits
- 10. 10. Displays
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- 11. 4.Stepper Motors
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- 12. 11. Magnetometer
- 12. 12. IMU Selection

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- 13. 2.Noise in Electronics
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- 13. 4.Fourier Transform
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