

6-Month Mechatronics Daily Task Plan (ECE Student)

Time per day: ~1 hour | Focus: Strong Mechanics + Mechatronics Integration | Goal: Job-ready in 6 months

Week 1 – Basics of Engineering Mechanics

- Day 1: Scalars, vectors, units, basic math revision
- Day 2: Forces, types of forces, free body diagrams
- Day 3: Resultant of forces, equilibrium condition
- Day 4: Moments and torque concepts
- Day 5: Applications of torque in machines
- Day 6: Solve basic statics problems
- Day 7: Weekly revision + notes

Week 2 – Statics Continued

- Day 8: Rigid body equilibrium
- Day 9: Friction – static vs kinetic
- Day 10: Ladders and block problems
- Day 11: Center of mass & centroid
- Day 12: Simple trusses
- Day 13: Real-world statics examples
- Day 14: Weekly revision

Week 3 – Dynamics Fundamentals

- Day 15: Motion, displacement, velocity, acceleration
- Day 16: Newton's laws of motion
- Day 17: Linear motion problems
- Day 18: Work and energy
- Day 19: Power and efficiency
- Day 20: Momentum and impulse
- Day 21: Revision + numericals

Week 4 – Rotational Mechanics

- Day 22: Angular motion basics
- Day 23: Moment of inertia
- Day 24: Torque and angular acceleration
- Day 25: Rotational energy
- Day 26: Flywheel applications
- Day 27: Simple rotational problems
- Day 28: Revision

Week 5 – Mechanisms

- Day 29: Links, joints, kinematic pairs
- Day 30: Degrees of freedom
- Day 31: Four-bar mechanisms
- Day 32: Gear trains basics
- Day 33: Belt and pulley systems
- Day 34: Mechanism applications
- Day 35: Revision + sketching

Week 6 – Materials & Strength

- Day 36: Stress and strain
- Day 37: Young's modulus
- Day 38: Bending of beams
- Day 39: Torsion in shafts
- Day 40: Safety factor
- Day 41: Material selection
- Day 42: Revision

Week 7 – Motors & Actuators

- Day 43: DC motor working
- Day 44: Torque-speed characteristics
- Day 45: Stepper motor basics
- Day 46: Servo motors
- Day 47: Motor drivers
- Day 48: Applications in robotics
- Day 49: Revision

Week 8 – Sensors

- Day 50: Sensor classification
- Day 51: Position sensors
- Day 52: Speed sensors
- Day 53: Force and pressure sensors
- Day 54: Temperature sensors
- Day 55: Sensor interfacing overview
- Day 56: Revision

Week 9 – Control Systems

- Day 57: Open vs closed loop control
- Day 58: Feedback systems
- Day 59: Transfer function idea
- Day 60: PID controller basics
- Day 61: Stability concept
- Day 62: Real-world control examples

- Day 63: Revision

Week 10 – Embedded Basics

- Day 64: Microcontroller overview
- Day 65: Digital I/O
- Day 66: Analog I/O
- Day 67: PWM concept
- Day 68: Timers and interrupts
- Day 69: Serial communication
- Day 70: Revision

Week 11 – Robotics Basics

- Day 71: Robot types
- Day 72: Degrees of freedom
- Day 73: Forward kinematics
- Day 74: Inverse kinematics
- Day 75: Differential drive robots
- Day 76: Robot sensors
- Day 77: Revision

Week 12 – Automation & PLC

- Day 78: Industrial automation overview
- Day 79: PLC basics
- Day 80: Ladder logic
- Day 81: Industrial sensors
- Day 82: Actuators in automation
- Day 83: Automation case study
- Day 84: Revision

Week 13 – CAD & Design

- Day 85: CAD software intro
- Day 86: Sketching parts
- Day 87: 3D modeling basics
- Day 88: Assembly modeling
- Day 89: Design constraints
- Day 90: Manufacturing awareness
- Day 91: Revision

Week 14 – Pneumatics & Hydraulics

- Day 92: Pneumatics basics
- Day 93: Pneumatic components
- Day 94: Pneumatic circuits

- Day 95: Hydraulics basics
- Day 96: Hydraulic actuators
- Day 97: Comparison & applications
- Day 98: Revision

Weeks 15–18 – Mini Project

- Day 99–126: Design, build and test a simple mechatronics project (robot, automation setup, or smart system)

Weeks 19–22 – Advanced Integration

- Day 127–154: Improve project, add sensors, control logic, documentation

Weeks 23–24 – Job Preparation

- Day 155: Resume building
- Day 156: Portfolio creation
- Day 157: Project explanation practice
- Day 158: Interview questions practice
- Day 159: Company research
- Day 160: Mock interviews
- Day 161–168: Light revision + confidence building