

Course Map

MATHEMATICAL FOUNDATION

- ODE, LTI systems
- Laplace Transform
- Partial Fractions
- Fourier Transform /Series
- Convolution

SYSTEM MODELLING

- Mechanical Systems
 - Translational
 - Rotational
- Electrical Systems
 - Op-Amps
 - Complex Impedance
- Thermal/Fluid Systems
- Analogous Systems
- Transfer Function Approach
- State-Space Approach

Time Domain Analysis + Controller Design Synthesis

- Transient response
- System order
- Time constant, damping ratio, natural frequency
- Step and impulse response
- PID Controller
- Stability Analysis (Routh-Hurwitz stability criterion)
- Root Locus

Frequency Domain Analysis + Controller Design Synthesis

- Steady-state response
- Sinusoidal Transfer Function
- Vibration Analysis
- Bode Diagram
- Nyquist plots
- Phase and Gain Margins

Active Learning

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Interactive Investigation

Interactive Investigation

1-D Project (Assigned Week 6, Due 25 Apr)