

1. INTRODUCTION

Topics:

Objectives:

1.1 BASIC TERMINOLOGY

- Modeling
- Explicit solutions
- Numerical solutions
- Empirical data
- Simulation
- Lumped parameter (masses and springs)
- Distributed parameters (stress in a solid)
- Continuous vs. Discrete
- Linear vs. Non-linear

- linearity and superposition
- reversibility
- through and across variables
- Analog vs. Digital
- process vs. controllers
- Basic system categories below,

Static

Dynamic

Stochastic
Deterministic

Distributed
Lumped

Non-linear
Linear

Continuous
Discrete

Figure 1.1 Model Classifications

- control system types: servo vs. regulating/process control
- open loop vs. closed loop
- disturbances
- component variations
- system error
- analysis vs. design
- mechatronics
- embedded systems
- real-time systems
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1.2 EXAMPLE SYSTEM

- Servo control systems
- Robot

1.3 SUMMARY

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1.4 PRACTICE PROBLEMS

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