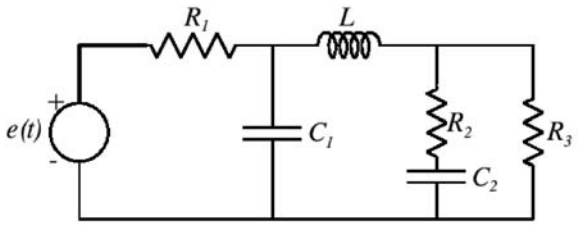
ME242 – MECHANICAL ENGINEERING SYSTEMS

LECTURE 26:

- Intermediate Modeling – Simple Circuits 4.1

SIMPLE CIRCUITS

Some Practice: Electrical System



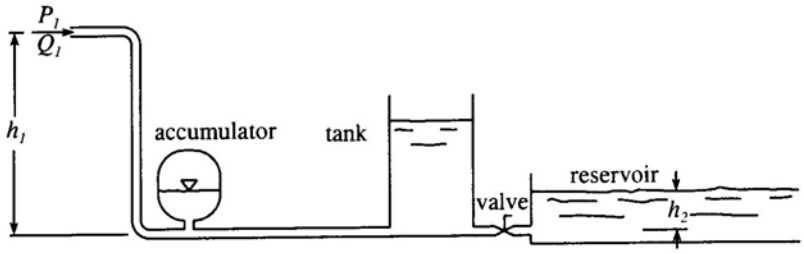
ELECTRIC CIRCUITS

Identify all nodes and all elements
(*there are two nodes for each element*)

1. Represent each electrical junction (node) with a 0 junction
   - Represent each element with I, R or C
     (*each element gets a bond to it*)
2. Connect each element's bond to a 1 junction
   - Connect each 1 junction to 2 0 junctions
3. Discard all bonds for $e = 0$ (ground) and $i = 0$
4. Eliminate all junctions with only two bonds

SIMPLE CIRCUITS

Some Practice: Fluid System



FLUID CIRCUITS

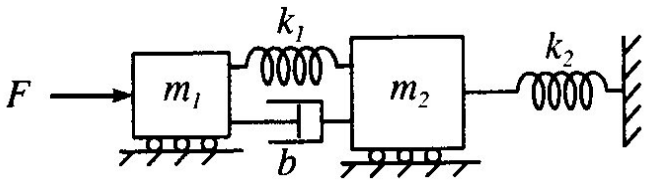
Identify all nodes and all elements
(*there are two nodes for each element*)

1. Represent each node with a 0 junction
   - Represent each element with I, R or C
     (*each element gets a bond to it*)
2. Connect each element's bond to a 1 junction
   - Connect each 1 junction to 2 0 junctions
3. Discard all bonds for $e = 0$ (ground) and $i = 0$
4. Eliminate all junctions with only two bonds

Just like electrical circuits!

SIMPLE CIRCUITS

Some Practice: Mechanical System



MECHANICAL CIRCUITS

Identify all nodes and all elements
(*there are two nodes for each element*)

1. Represent each mech. junction with a 1 junction
   - **Place all I's on 1 junctions**
2. Connect each R, C elements on a 0 junction
   - Connect each 0 junction to 2 1 junctions
3. Coalesce bonded junctions of same type
4. Add in S, S_e S_f as needed.
5. Discard all bonds for $e = 0$ (ground) and $f = 0$
6. Eliminate all junctions with only two bonds