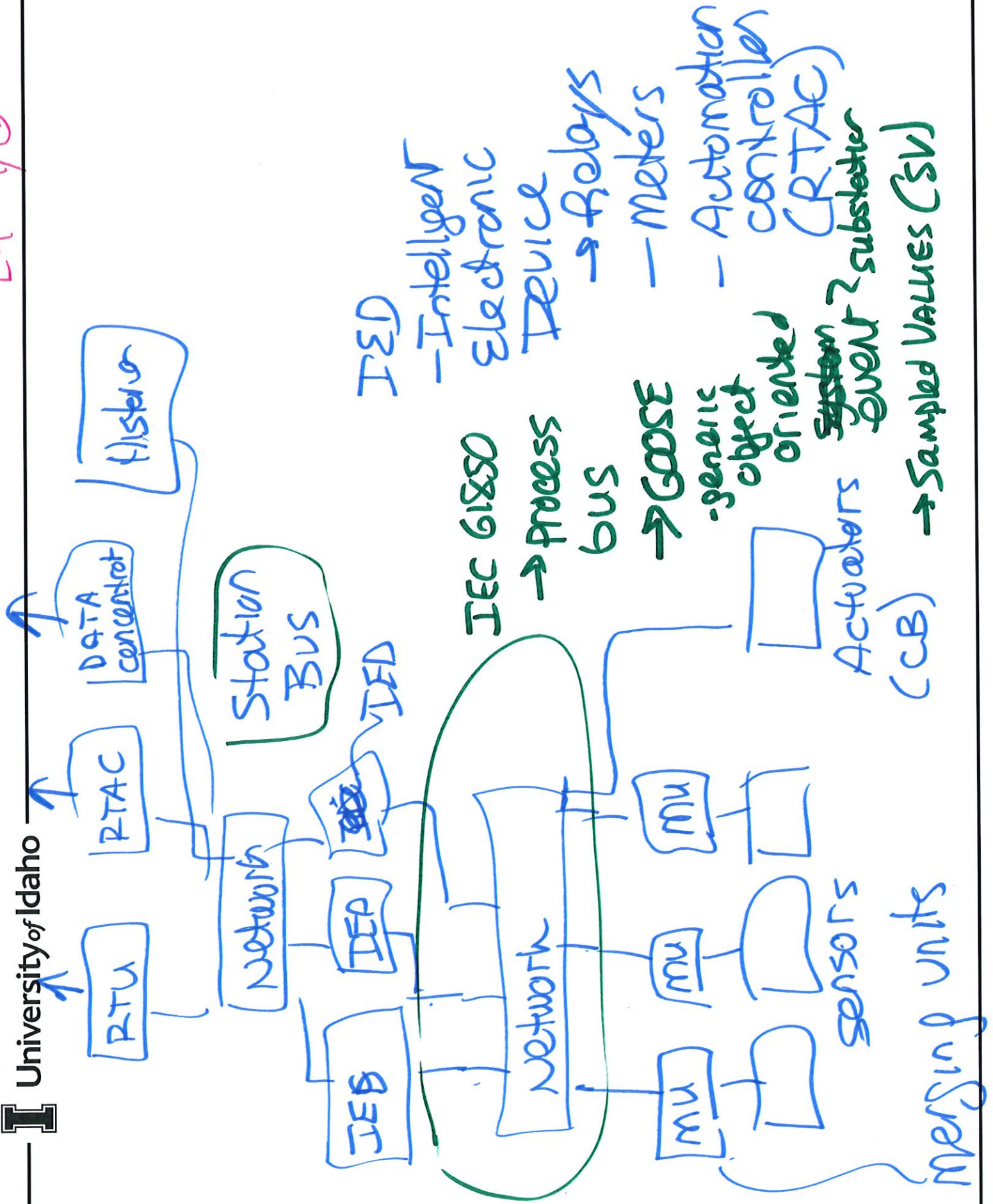


ECE 444 / ECE 544 /
CS 444 / CS 544

Supervisory Control and Critical Infrastructure Systems

Session 4



IED

- Intelligent Electronic Device

IEC 61850 → Process bus

→ GOOSE

- generic object oriented

System Event Substation

→ Sampled Values (SV)

Actuators (CB)

sensors

Merging units

Advantages

- Documentation

- self-documentation requirement

→ easier to test &

commissioning

(acceptance test) before

going online)

- multiple vendors equipment
worth together

- Testing & Commissioning → allows more
complex systems

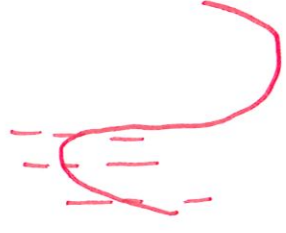
- easier to revise statements
- reliability of measurements
 - can collect from other sources

Latency

- sensors (current transformer, voltage transformer)

→ a few

microseconds



→ merging unit processing

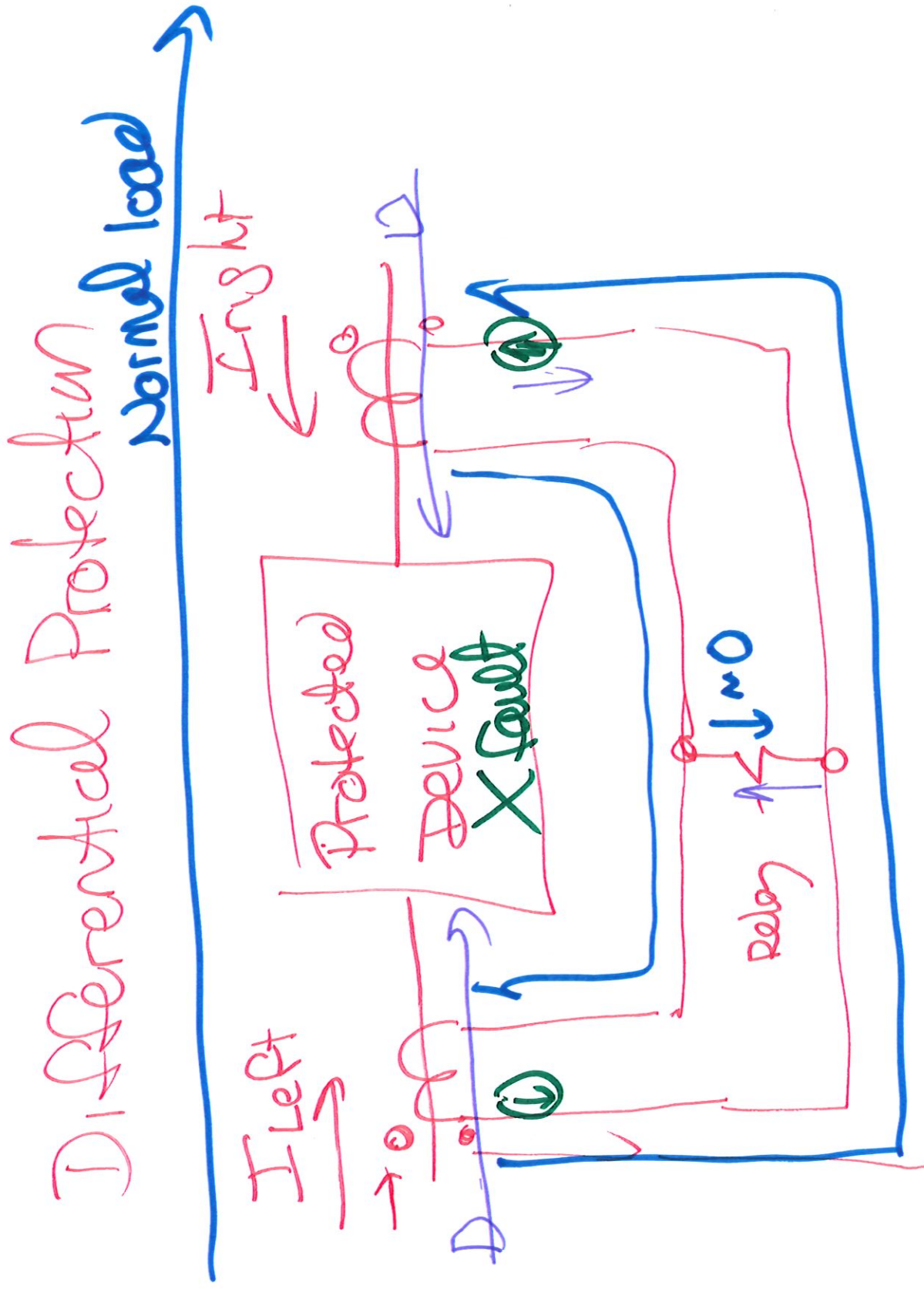
time → up to 2ms

(IEC 61869-9)

sampled values

→ Network propagation time to reach IEC

→ up to 3ms



- Buffers for storing measurements
- Protective Relay - microprocessor
 - saving event reports
 - can multiple events