



# UNIT III PROCESSOR AND CONTROL UNIT

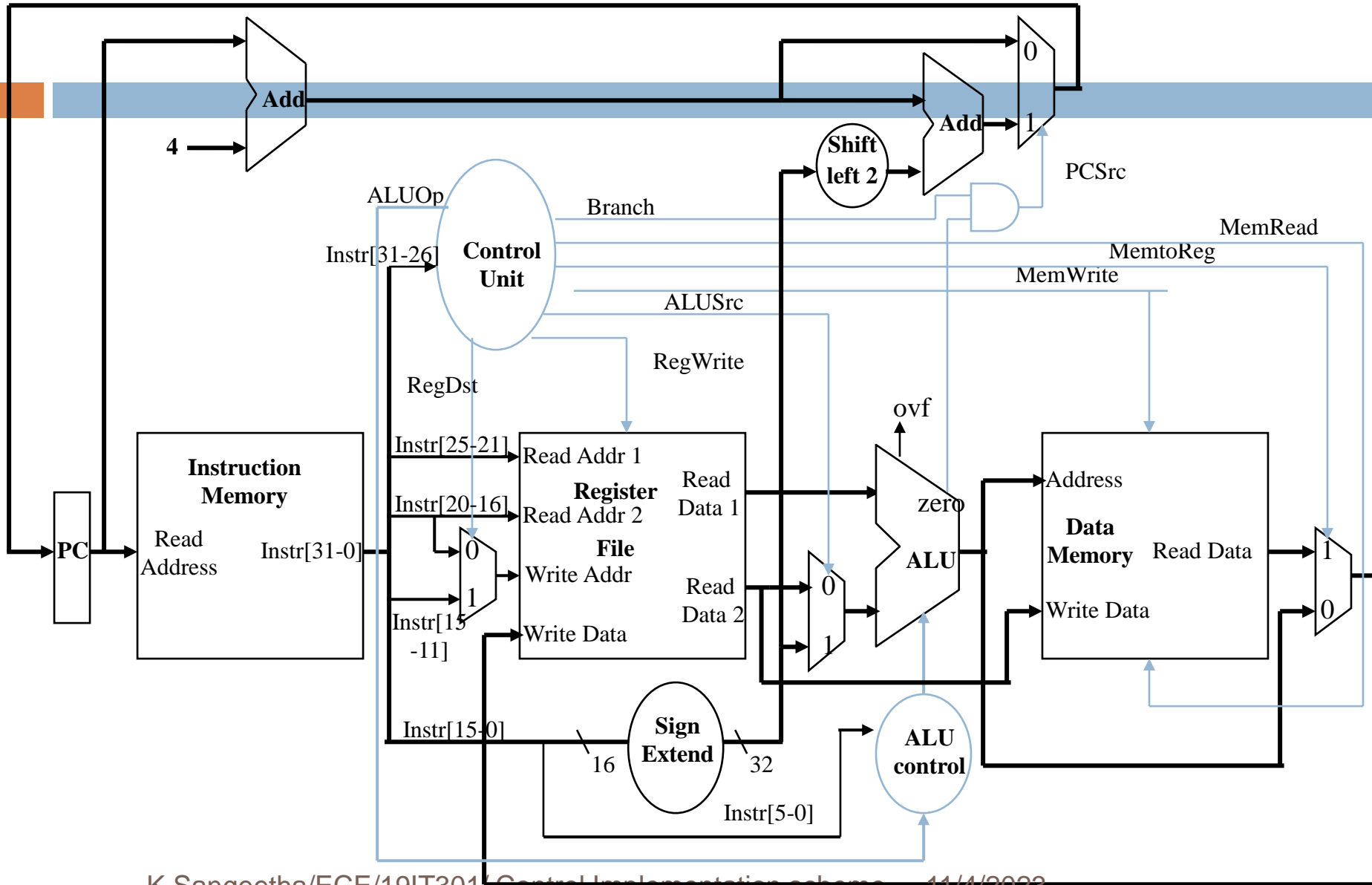
Basic MIPS implementation – Building datapath – Control Implementation scheme – Pipelining – Pipelined datapath and control – Handling Data hazards & Control hazards – Exceptions.

**Control Implementation scheme**



# CS6303 COMPUTER ARCHITECTURE

## Recall the Prior Knowledge





# The ALU Control

- ALU used for
  - ▣ Load/Store: F = add
  - ▣ Branch: F = subtract
  - ▣ R-type: F depends on function field

ALU control	Function
0000	AND
0001	OR
0010	add
0110	subtract
0111	set-on-less-than
1100	NOR



# ALU CONTROL

- Assume 2-bit ALUOp derived from opcode
  - ▣ Combinational logic derives ALU control

opcode	ALUOp	Operation	funct	ALU function	ALU control
lw	00	load word	XXXXXX	add	0010
sw	00	store word	XXXXXX	add	0010
beq	01	branch equal	XXXXXX	subtract	0110
R-type	10	add	100000	add	0010
		subtract	100010	subtract	0110
		AND	100100	AND	0000
		OR	100101	OR	0001
		set-on-less-than	101010	set-on-less-than	0111

# The Main Control Unit

□ Control signals derived from instruction

