ALU Units and Their Internal Modules

1. Arithmetic Unit
- Adder
- Subtractor
- Incrementer
- Decrementer
- Multiplier
- Divider
- Negator (Two's Complement Generator)
- Modulo Unit

2. Logic Unit
- AND
- OR
- XOR
- NOT
- NAND
- NOR
- XNOR
- Bit Set / Bit Clear Module

3. Shifter Unit
- Logical Left Shifter (SLL)
- Logical Right Shifter (SRL)
- Arithmetic Right Shifter (SRA)
- Rotate Left (ROL)
- Rotate Right (ROR)

4. Comparator Unit
- Equal Comparator (==)
- Not Equal Comparator (!=)
- Greater Than Comparator (>)
- Less Than Comparator (<)
- Greater or Equal Comparator
- Less or Equal Comparator ($\leq$)
- Zero Detector
- Sign Detector

5. Flag Unit
- Zero Flag (Z)
- Carry Flag (C)
- Negative Flag (N)
- Overflow Flag (V)
- Parity Flag (P)
- Sign Flag (S)
- Auxiliary Carry Flag (AC)
- Flag Register
- Flag Update Logic
- Flag Control Logic

6. Control Unit

- Opcode Decoder
- Operation Selector (MUX Controller)
- ALU Operation Decoder
- Function Control Register
- Enable/Disable Logic
- Micro-operation Controller
- Pipeline Control