Digital Waveforms
- Voltage levels change back and forth between the HIGH and LOW voltage states
- Made up of a series of pulses

Waveforms
- Made up of a series of pulses

Periodic Waveform
- Repeats itself at the same time interval

\[
T = \text{Period} \implies \text{Time interval between rising edges or falling edges}
\]

Frequency \( f \) \( \implies \text{Time rate at which a waveform repeats itself} \)

Frequency \( f = \frac{1}{T}, T = \frac{1}{f} \)

Duty Cycle = \( \frac{\text{Pulse width}}{\text{Period}} \times 100\% \)

Non-Periodic Waveform
Clock Waveform
- Timing waveform that synchronizes all other waveforms
- Periodic Waveform

Serial versus Parallel Data Transfer
- Serial: Data is sent one bit at a time over a single line
- Parallel: All bits are sent simultaneously over multiple lines

Integrated Circuits
- Utilize Bipolar Junction Transistors (BJT’s) or Metal Oxide Semiconductor Field Effect Transistors (MOSFET’s)

BJT’s
- Used in TTL (Transistor Transistor Logic) chips
- Supply Voltage is 5 Volts
- Not susceptible to static discharge

MOSFET’s
- Used in CMOS (Complementary Metal Oxide Semiconductor) chips
- Supply voltage is 3.3 Volts
- More susceptible to static discharge

Fixed Function Logic Circuits
- Logic functions are set and can’t be changed

Programmable Logic Circuits
Logic functions can be programmed and sometimes reprogrammed