



**O N L I N E**

**LEARNING**

# Digital Electronics (SKEE1223)

## Introduction to Analog vs Digital

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- **Electronics can broadly be divided into two main categories – analog and digital. Analog electronics involves circuits with variables that are continuous while digital electronics are circuits with discrete values. They both use the same electronic device – mainly transistors. In case of digital circuits, the transistor acts like a switch – on and off.**



- **Almost all physical signals like pressure and heat are analog in nature. Analog signal is a continuous signal. This concept can be explained by a normal switch and a dimmer switch. The normal switch takes the form of a digital system while the dimmer switch which the intensity of light can be varied takes the form of an analog system.**



- **An example of a pure analog system is the audio amplifier. Our voice is converted into electrical signals by the microphone and then amplified through the audio amplifier. This amplified electrical signals is converted to audio by the speaker. The advantage of the analog system like audio amplifier is it delivers a high output power producing good audio sound.**



- **An example of a pure digital system is the calculator. Each keypad has a different code. The encoder will send the correct code to be processed by the processing unit. The data is then decoded through a decoder circuit before it is displayed.**



- **Most systems use a combination of analog and digital systems. Example of hybrid system: Home theatre system. A compact disc is read by a CD drive. The digital data is converted to analog signal through digital to analog converter (DAC) before the signal is amplified using audio amplifier.**



- **Why hybrid system? In a digital system, we can store more data, processed the data faster and sent efficiently. The design of a digital system is simpler and structured and can also be programmed. The main advantage of an analog system is it produces a higher output power compared to the digital system. In case of audio amplifier, the quality of sound is much better.**