SNS COLLEGE OF ENGINEERING

An Autonomous Institution

Coimbatore-641 107

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

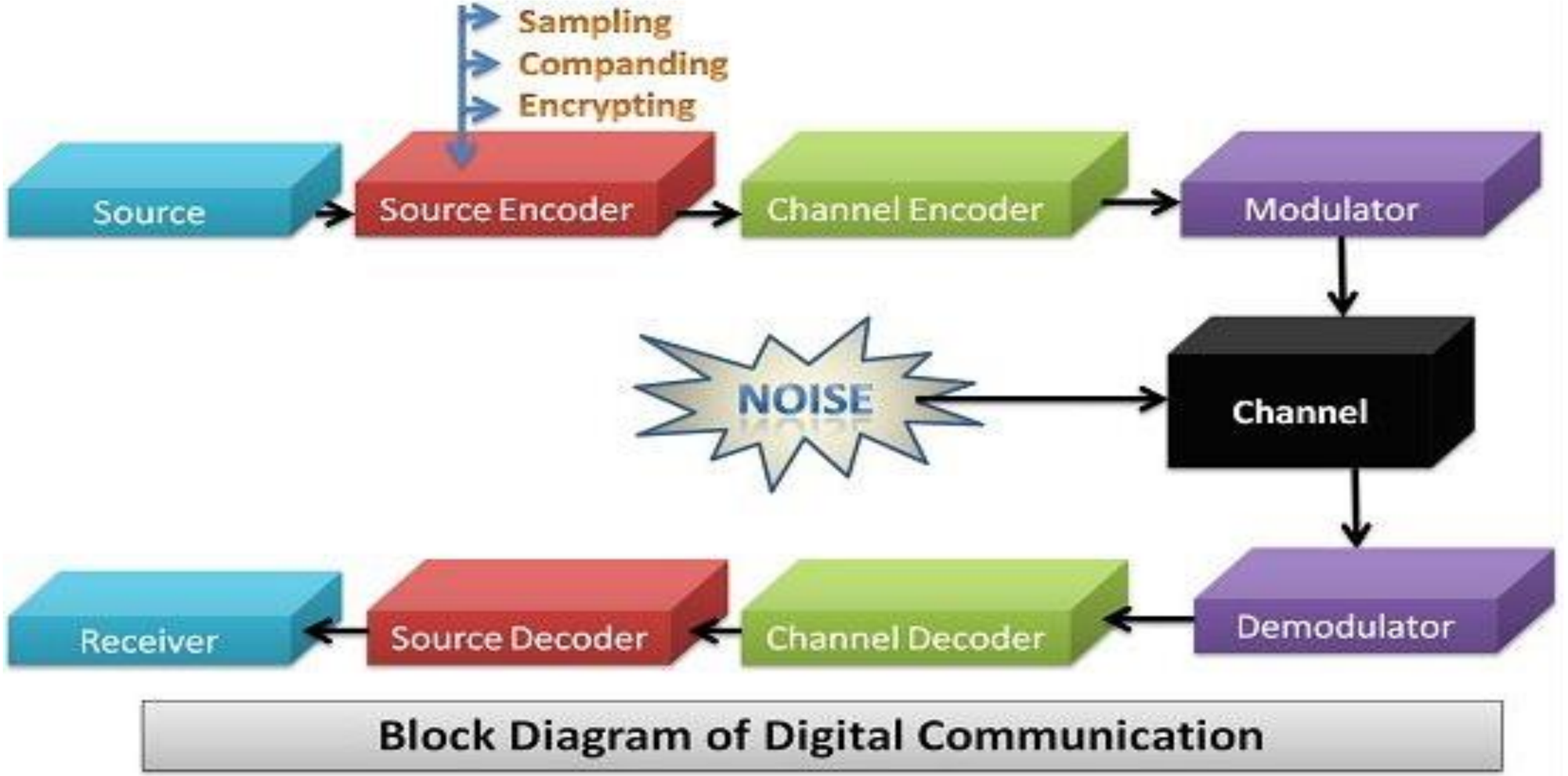
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19EC504-ANALOG AND DIGITAL COMMUNICATION

III YEAR/ V SEMESTER

UNIT - III - DIGITAL COMMUNICATION

TOPIC - BLOCK DIAGRAM OF DIGITAL COMMUNICATION



Block Diagram of Digital Communication

Digital Communication System

- The process of efficiently converting the output of either an analog or a digital source into a sequence of binary digits is called *source encoding*.
- The sequence of binary digits from the source encoder, which we call the *information sequence* is passed to the *channel encoder*.
- The purpose of the channel encoder is to introduce, in a controlled manner, some redundancy in the binary information sequence which can be used at the receiver to overcome the effects of noise and interference encountered in the transmission of the signal through the channel.

Source Encoding

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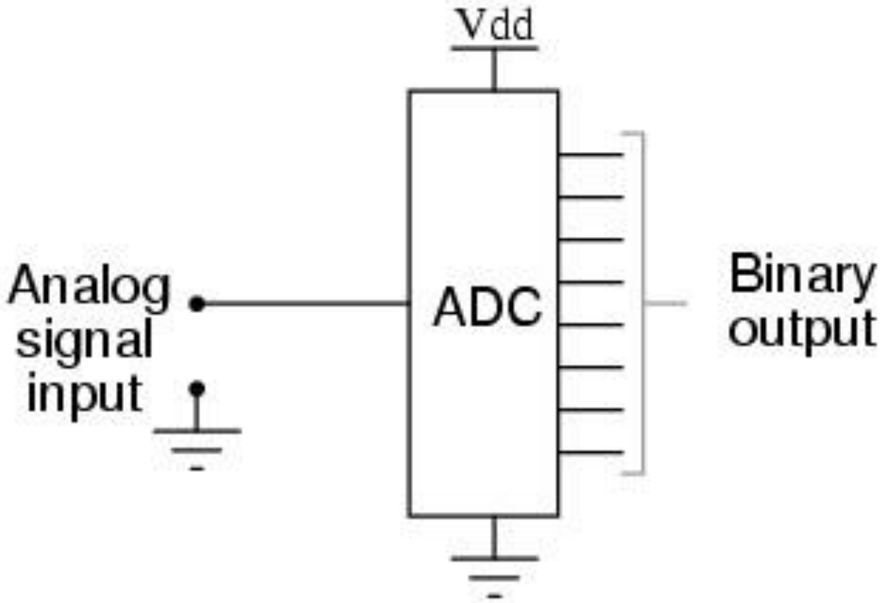
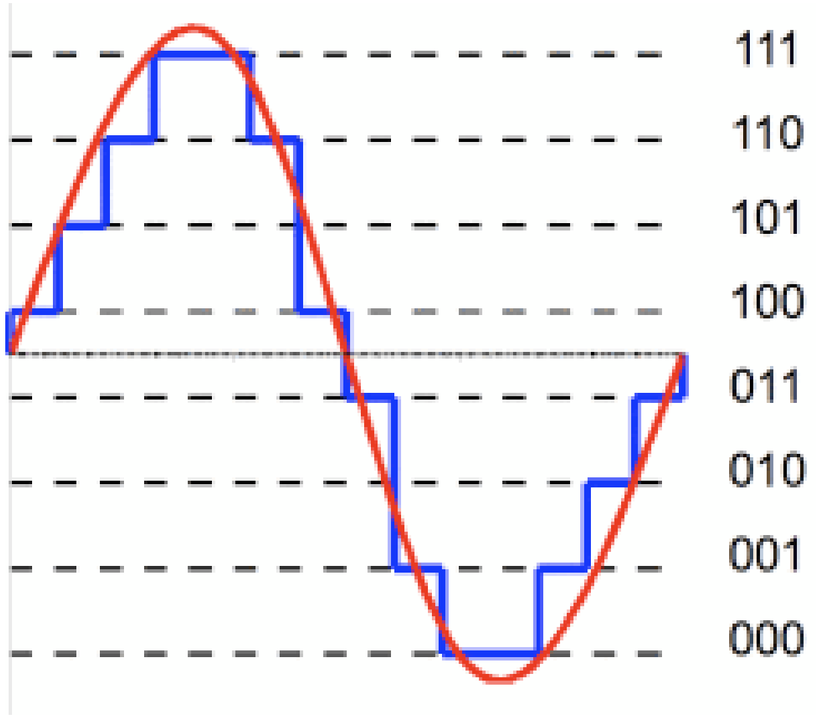




Channel Encoding

- A major feature of digital data transmission is the myriad techniques used to protect data or speech through coding.

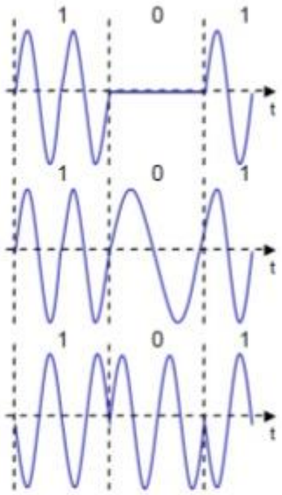
- Coding adds additional bits to the original payload to provide a means of protecting the original information.

Digital Modulator

- The binary sequence at the *output* of the channel encoder is passed to the *digital modulator*, which serves as the interface to the communications channel.

Digital modulation techniques

- Amplitude Shift Keying (ASK):
  - change amplitude with each symbol – frequency constant
  - low bandwidth requirements
  - very susceptible to interference
- Frequency Shift Keying (FSK):
  - change frequency with each symbol
  - needs larger bandwidth
- Phase Shift Keying (PSK):
  - Change phase with each symbol
  - More complex
  - robust against interference

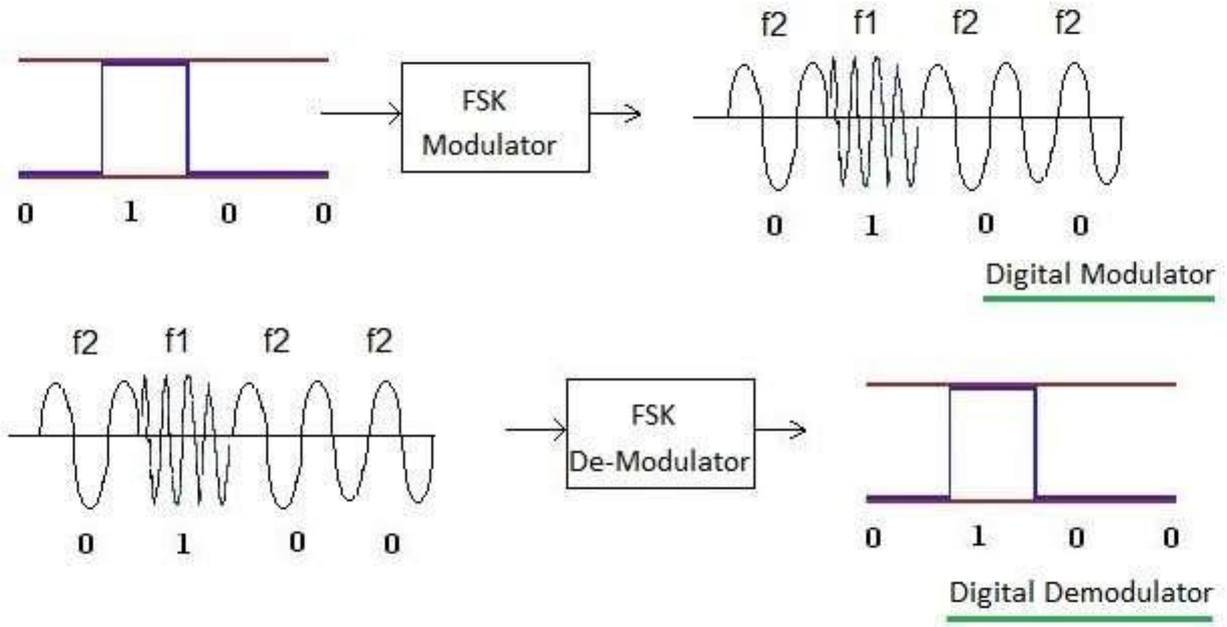


Digital Modulator

- Since nearly all of the communication channels encountered in practice are capable of transmitting electrical signals (waveforms), the primary purpose of the digital modulator is to map the binary information sequence into signal waveforms.

Digital Demodulator

- At the receiving end of a digital communications system, the *digital demodulator* processes the channel-corrupted transmitted waveform and reduces each waveform to a single number that represents an estimate of the transmitted data symbol.



Channel Decoder

- The Channel decoder recovers the information bearing bits from the coded binary stream.

Source Decoder

- As- a final step, when an analog output is desired, the source decoder accepts the output sequence from the channel decoder and, from knowledge of the source encoding method used, attempts to reconstruct the original signal from the source.

THANK YOU