

1.0. OVERVIEW OF MODULE

Why has digital signal processing become so important?

- All signal information is represented by finite length binary words:

0	1	1	0	1	1	1	1
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⇒ require only bistable circuits and storage medium to process, store, and transmit signals.

- Benefits:
 - precision,
 - reproducibility (possibility of perfect signal regeneration),
 - all signal processing operations are implemented as either arithmetic or logical operations.
- The same digital computer technology that is used for general information processing can be used for DSP.

MODULE 1 OBJECTIVES

- Develop fundamental tools for analysis of continuous-time and discrete-time signals and systems.
- Use these tools to gain an understanding of:
 - sampling and quantization,
 - digital filters,
 - discrete Fourier transform.

OUTLINE

1. Signals
2. Systems
3. Fourier analysis
4. Sampling and quantization
5. Z transform
6. Digital filters
7. Discrete Fourier Transform (DFT)

Why study continuous-time case?

- Signals usually originate in continuous-time (analog) form and will ultimately be converted back to analog form.
- It is often easier to conceptualize the effect of a signal processing operation in continuous-time than in discrete-time.
- For maximum efficiency, we will develop the two cases side-by-side.