SIGNALS AND SYSTEMS

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Introduction to the Course

CPE308- Signals and Systems syllabus

week	Week Topics
1	Concepts of signal and system
2	Periodic and non-periodic signals
3	Basic signals operations
4	Even and odd signals
5	Types of Systems 1
6	Types of Systems (Continued)
7	Impulse, unit step and ramp signals
8	Integration over signals
9	LTI systems (Impulse response)
10	Laplace Transform
11	Convolution
12	Convolution (Continued)
13	Fourier series
14	Fourier series (Continued)

grading

Midterm exam 40%

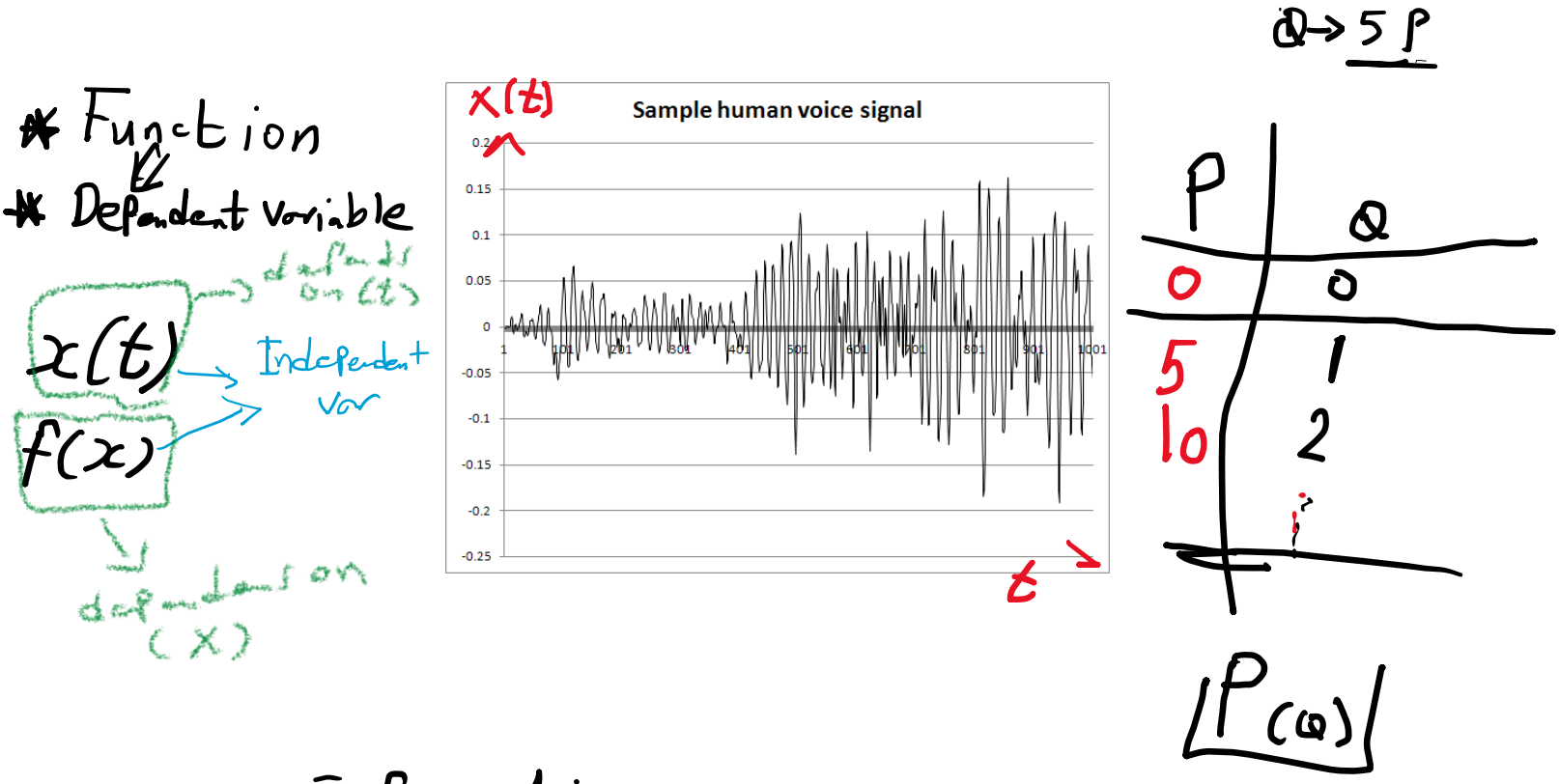
Final exam 50%

Homework 10%

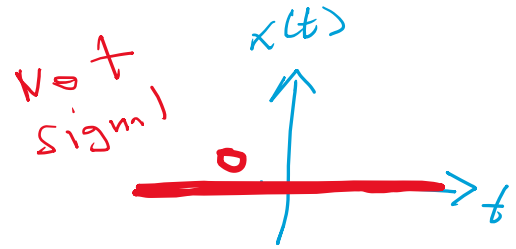
Signals and Systems

(CPE308)

The Definition of Signal



* Carry Information
* Must vary with Independent Variable.



Examples:

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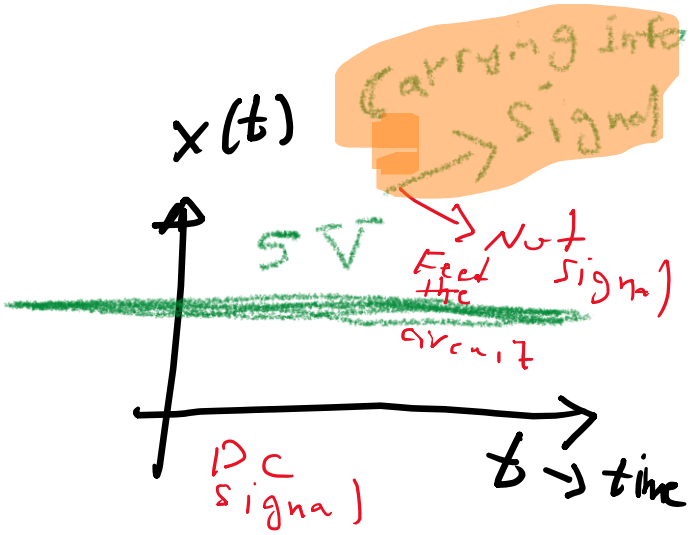
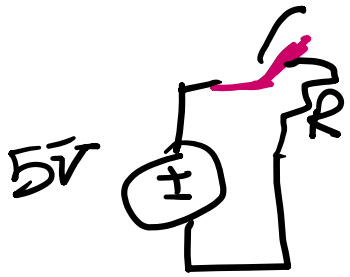
ON ↔ OFF

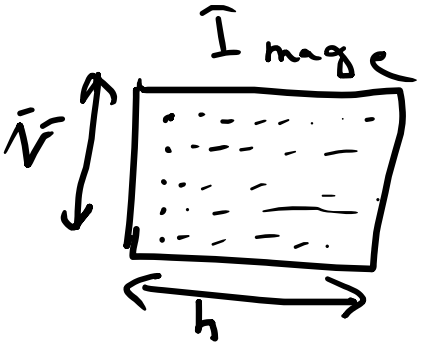




Signal Representation

depend on t → 1) $x(t)$ → independent Var/time

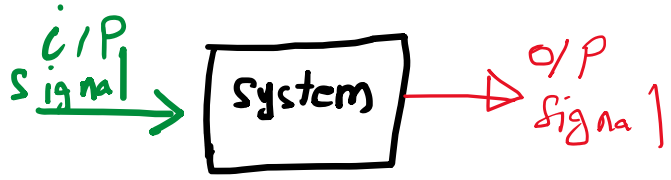
2) $g(V,h)$

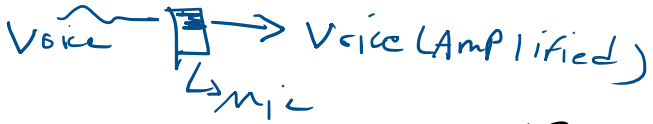


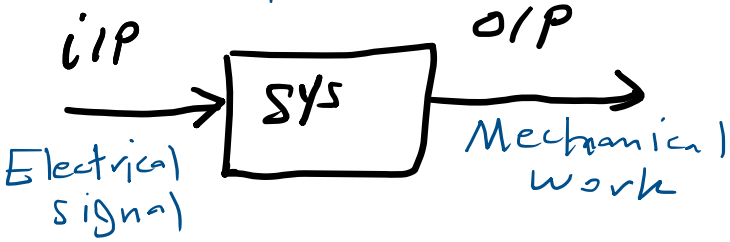
3) $x(t_1, t_2)$ — time

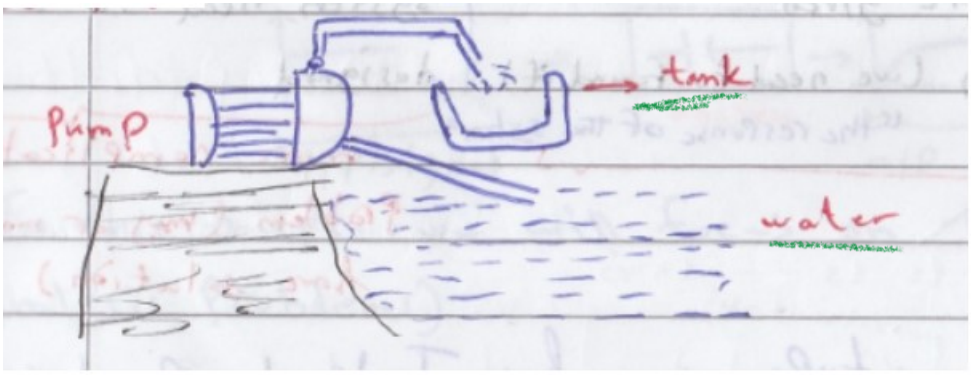
The Definition of System

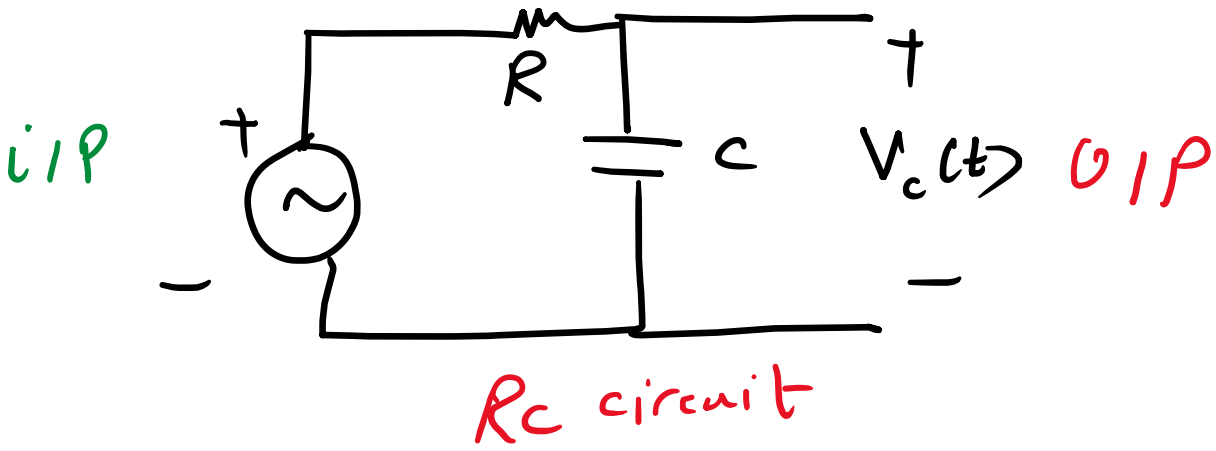
* Meaningful interconnection of Physical Devices & components

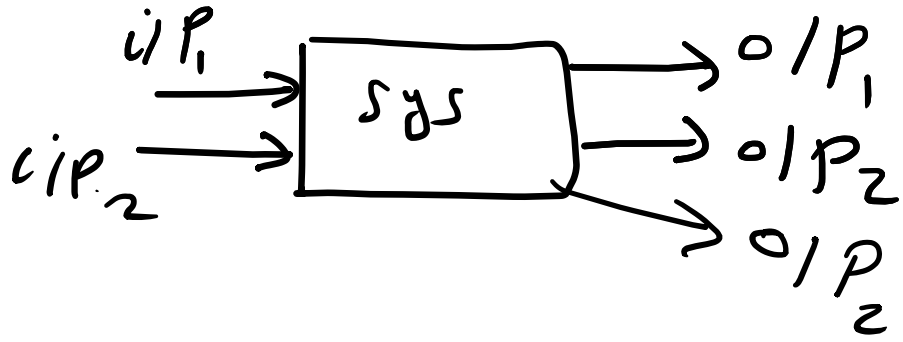


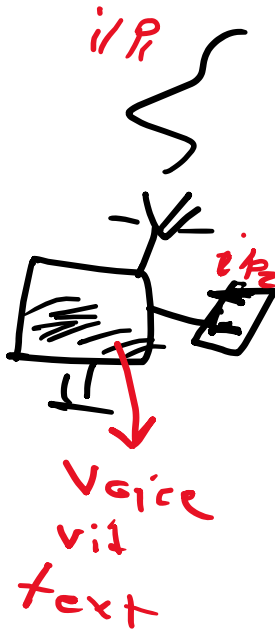










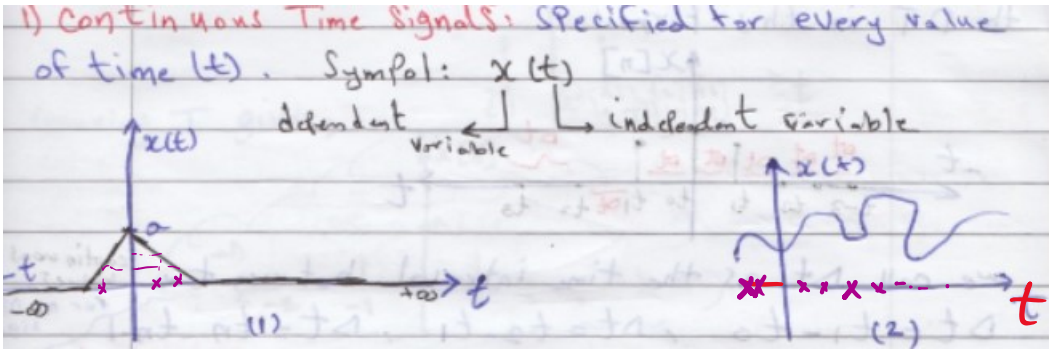


Continuous Time and Discreate Time Signals

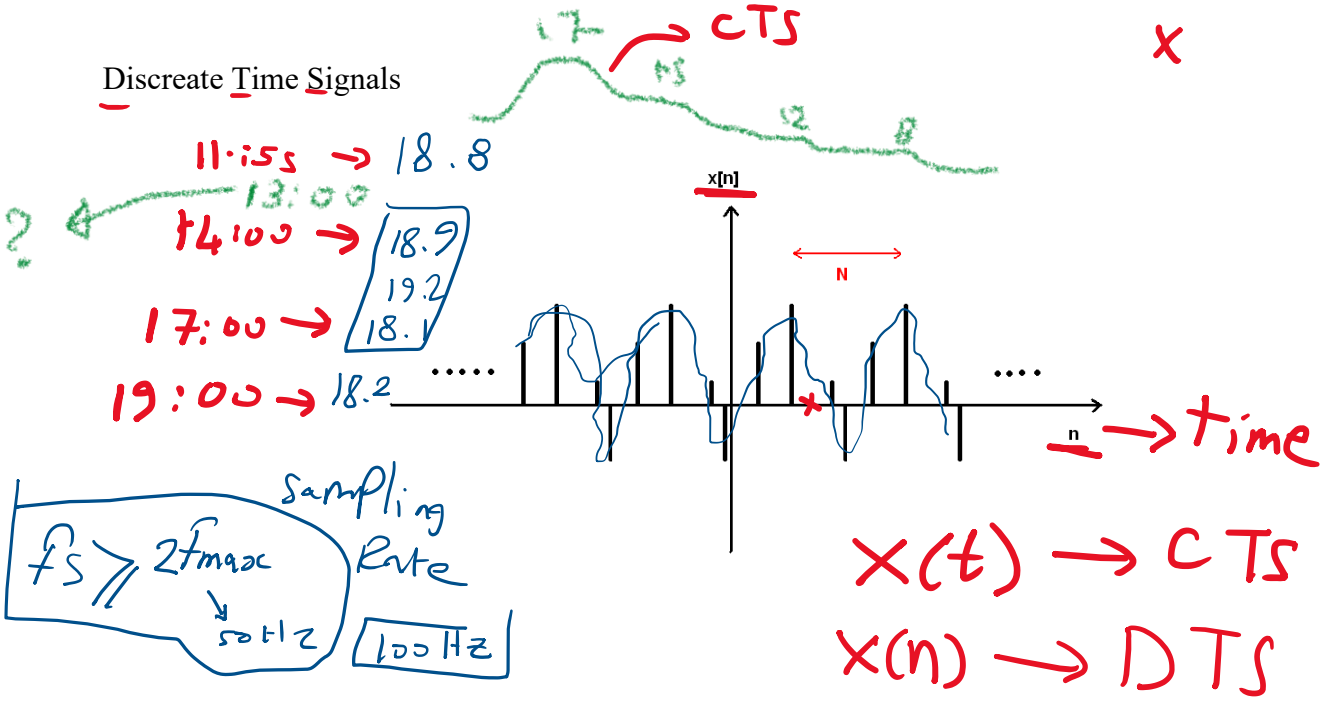
Continuous Time Signals

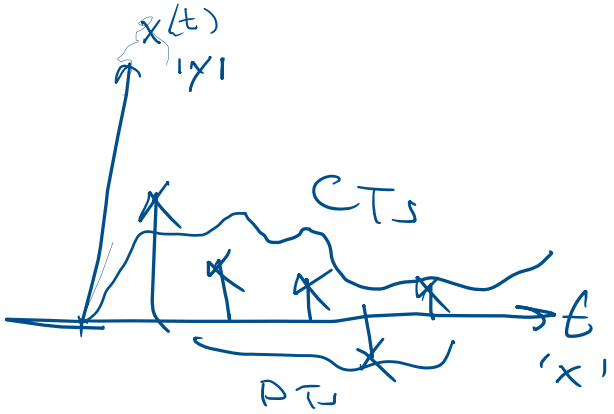
Life

Time



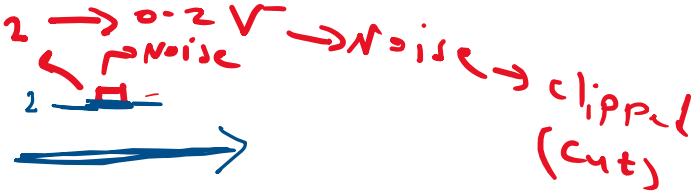
Discreate Time Signals



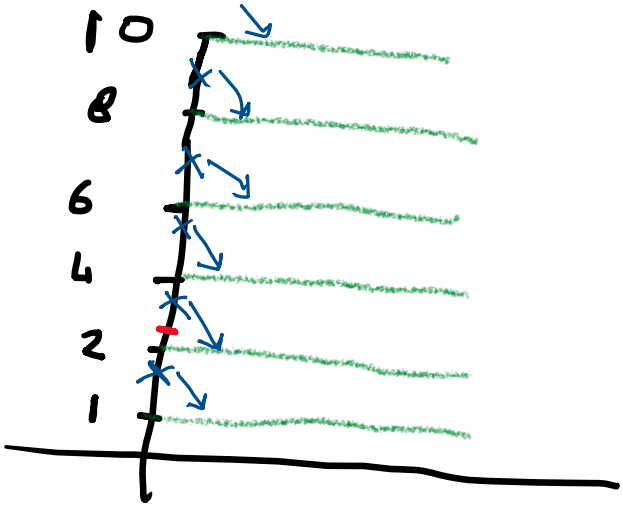


Digital Signal → DTS

2-2 → 0-2 V → Noise → clipped (cut)



Why it's important?

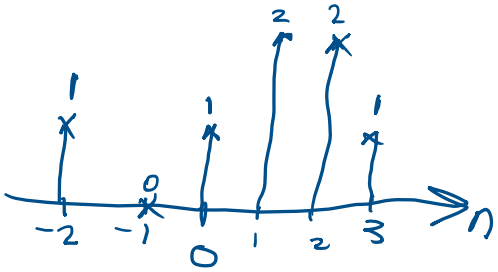


→ DTS

Example: $x\{n\} = \{1, 0, \underline{1}, 2, 2, 1\}$, Plot the Discrete signal.

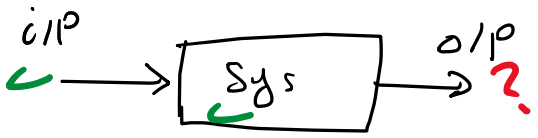
↳ time $-2 \quad -1 \quad \hat{0} \quad 1 \quad 2 \quad 3$

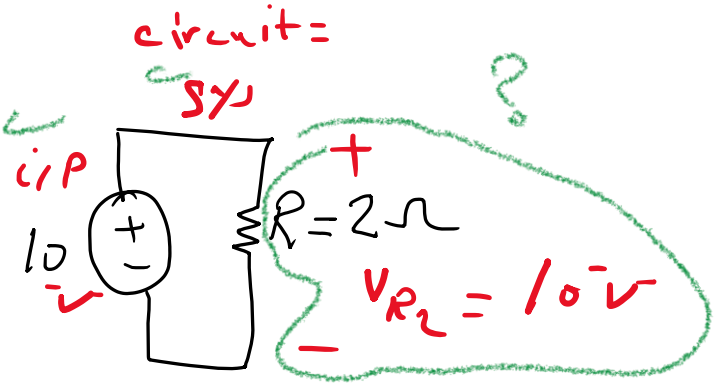
Note: the Arrow indicate when $n = 0$ (without this arrow



Types of Problem

1] Analysis Problem





there is always on solution

2] Designing Problem