ICE 503/IMPTE502 Discrete-Time Signal Processing

Lecture 0:

Basic Course Information

Basic Course Information

- **Credit, Lectures**
  - The course is 3 units
  - Lectures are on Thursday from 9:10 to 12:00
  - Language:
    - ✓ English

- **Instructor**
  - Professor Chao-Kai Wen
  - Office: IEC9009
  - Phone: (07) 525-2000 ext. 4488
  - Email: chaokai.wen@mail.nsysu.edu.tw
  - Office hours: Thursday 12:00-14:00, Friday 12:00-14:00, or by appointment

Basic Course Information
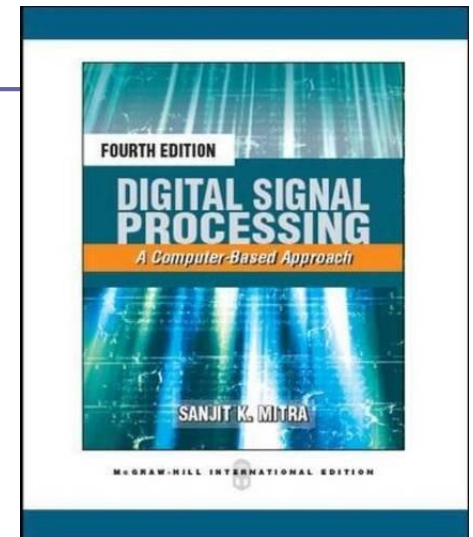
- **Teaching assistant**
  - Cheng-Yu Yang (a5241223@gmail.com)
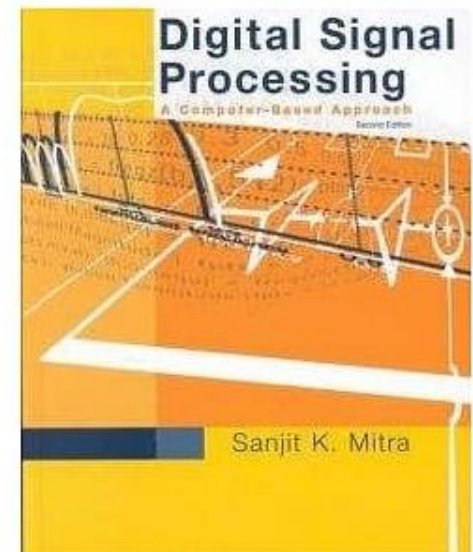 - Feng-Ji Chen (king19635@gmail.com)
  - Office: IEC 9029

- **Prerequisites**
  - Undergraduate knowledge of Signals and Systems
  - MATLAB (A Tutorial http://cu.nsysu.edu.tw/)

- **Textbook**
  - Sanjit K. Mitra, Digital Signal Processing: A Computer-Based Approach, 4/e, Mcgraw Hill Higher Education
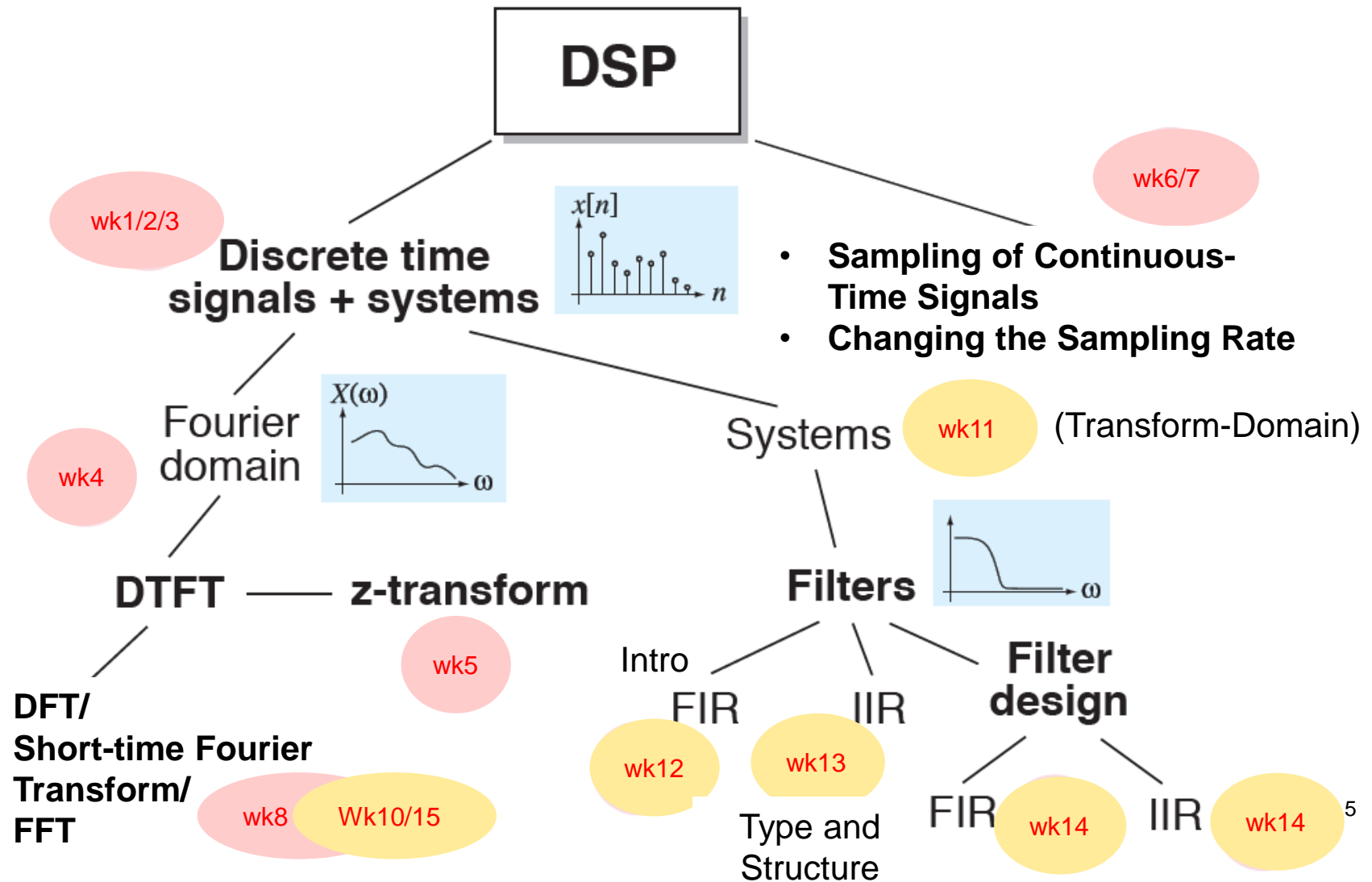
3e

4e

Basic Course Information

- **Goal**
  - We aim to give basic treatment knowledge of the discrete-time signal processing including linear systems, sampling, filtering and filter design, reconstruction, the discrete-time Fourier transforms, Fourier analysis of signals, the fast Fourier transform, and spectral estimation.
  - We will teach the basic theory for each of the transform domains and provide illustrative examples.

Slides are available on http://cu.nsysu.edu.tw/

Course Structure

DSP

wk6/7

wk1/2/3

Discrete time signals + systems

$x[n]$

- **Sampling of Continuous-Time Signals**
- **Changing the Sampling Rate**

Fourier domain

$X(\omega)$

wk4

Systems

wk11

(Transform-Domain)

DTFT — **z-transform**

Filters

ω

wk5

Intro

Filter design

FIR   IIR

DFT/ Short-time Fourier Transform/ FFT

wk8   Wk10/15

wk12   wk13

FIR   IIR

Type and Structure

wk14   wk14

Grading Structure

- **<u>Homework and Quiz (20%, each 10%):</u>**
  - ✓ Total of 12
  - ✓ The homework consists of two parts: 1) hand-writing and 2) MATLAB programming
  - ✓ You **don't** need to hand out the **hand-writing part**.
  - ✓ You **have to upload the programming part** through the course website (by Wed. 11:59pm).
  - ✓ (Discussion sections) TA will discuss the homework every Wed. 17:00 (online in Chin.) 18:00 (online in Eng.).
  - ✓ About one to two problems for quiz at the beginning of each lecture. The problems will be similar to the homework of each lecture.
  - ✓ 8:55-9:15 every Thursday (**can't make up**)

Very Important Note

Please do not send us any questions about make-up methods for the quiz

and homework. You will not get any response about these. There

is NO make-up method. Please submit them

earlier. We have about 12 quizzes and homeworks in total, of which the

best of the 10 will be selected for calculation. Therefore, it is okay to skip

two of them.

Grading Structure

- Midterm exam (40%):
  - ✓ Nov. 14th 09:10
  - ✓ 100 minutes
  - ✓ an A4 sized paper note

- Final exam (40%):
  - ✓ Jan. 9th 09:10
  - ✓ 100 minutes
  - ✓ an A4 sized paper note