

# Dept. of CSIE, National Taipei University of Technology

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2022 Fall Semester

Course : **Digital Image Processing (308852/309042)**

Credits : 3 credits

Instructor : Dr. Tun-Wen Pai (白敦文老師)

Class hours : Mon. 16:10~18:00 (the 6<sup>th</sup> Building Room:227)

Wed. 9:10~10:00 (the 6<sup>th</sup> Building Room:427)

Web : <https://istudy.ntut.edu.tw/learn/index.php>

Virtual Classroom : (Microsoft Teams)

[https://teams.microsoft.com/l/team/19%3aPBSLEuHRZwTZAbYeOZKI9\\_aVXbeYNeGwR\\_ZDKdGEwCp01%40thread.tacv2/conversations?groupId=37568530-2186-4035-9f9b-326b064be88e&tenantId=dfb5e216-2b8a-4b32-b1cb-e786a1095218](https://teams.microsoft.com/l/team/19%3aPBSLEuHRZwTZAbYeOZKI9_aVXbeYNeGwR_ZDKdGEwCp01%40thread.tacv2/conversations?groupId=37568530-2186-4035-9f9b-326b064be88e&tenantId=dfb5e216-2b8a-4b32-b1cb-e786a1095218)

Teams group code: xts0wsn

Textbook : Digital Image Processing

Authors : Rafael C. Gonzalez & Richard E. Woods (開發圖書公司) 4<sup>th</sup> Edition

References : Digital Image Processing Using MATLAB by Rafael C. Gonzalez, Richard E. Woods, and Steven L. Eddins, 2<sup>nd</sup> Edition (開發圖書公司)

Pre-requirement : Introduction to Signals and Systems

- Syllabus :
1. Introduce to Image Processing
    - Computer Imaging Systems
    - Human Visual Perception
    - Image Representation
  2. Introduction to Image Analysis
    - Preprocessing Techniques
    - Edge/Line Detection
    - Image Segmentation
    - Discrete Transform
    - Feature Extraction
  3. Image Enhancement in Spatial Domain
    - Grayscale Modification
    - Image Sharpening Filters
    - Image Smoothing Filters
  4. Image Enhancement in Frequency Domain
    - Fourier Transform
    - Image Sharpening Filters
    - Image Smoothing Filters
    - Homomorphic Filtering
  5. Introduction to Image Restoration
    - Spatial Filters for Noise Removal
    - Frequency Filters for Noise Removal
  6. Color Image Processing
    - Color Models
    - Pseudo-color Image Processing
    - Color Transformation
  7. Compression Algorithms
    - Image Compression Models

## Different Compression Algorithms

Software : MATLAB(registered trademark of MathWorks, INC.) for homework

Grade : HW (15%) Quiz (15%) Mid. (35%) Final (35%)

Graduate students are required to submit an extra paper reading report (To be considered as an extra homework).

TA: 吳陽生's Office hours: Tuesday 16:00~18:00 PM @ Hung-Yu Research Tech.  
Building, Room: 1621, Email: [t110598007@ntut.org.tw](mailto:t110598007@ntut.org.tw)

TWP's Office hours: Wed 16:30~18:30 PM @ Hung-Yu Research Tech. Building, Room:  
1524, Email : [twp@ntut.edu.tw](mailto:twp@ntut.edu.tw)

Notes: Events for class schedule

10/10/2022(Mon.) : National holiday (Double Tenth Day)

10/31/2022(Mon.) : Compensatory day for Taipei Tech Celebration Activities

01/01/2023(Mon.) : National holiday(New Year Holiday)

Quiz1: 10/12/2022

Quiz2: 11/02/2022

Midterm: 11/07/2022

Quiz3: 01/04/2023

Final: 01/09/2023

Report for grads due date: 1/15/2023