

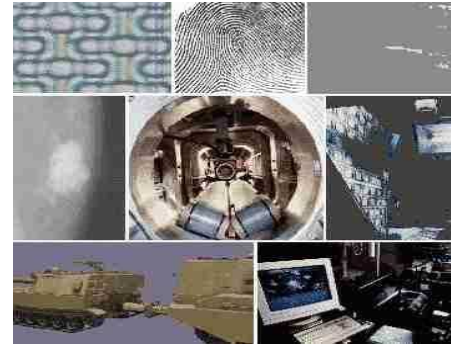
影像處理原理與應用

Principles and Applications of Image Processing



INTRODUCTION

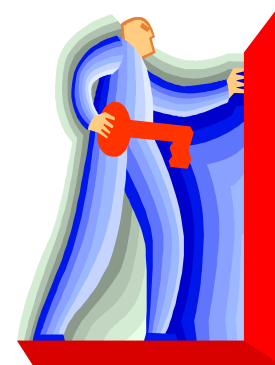
- 0.1 Course Description
- 0.2 Schedule
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- 0.4 Grading Policy
- 0.5 Course Website & Resources
- 0.6 Programming Languages
- 0.7 Related Courses



0.1 Course Description

This course introduces fundamental principles and applications of digital image processing. It emphasizes on the theory and algorithms as well as practical programming skills underlying a range of topics as follows.

1. Image acquisition and fundamentals
2. Image filtering and enhancement
3. Image restoration and reconstruction
4. Color image processing
5. Wavelets and other image transforms
6. Image compression
7. Morphological processing
8. Image segmentation
9. Feature description and extraction
10. Image pattern classification



0.1 Course Description

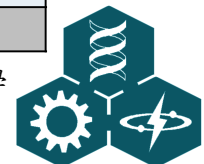
What you will learn from this course

- Fundamentals of Digital Image Processing
- Advanced Programming Skills
- Software and UI Design
- Algorithmic and Creative Thinking



0.2 Schedule

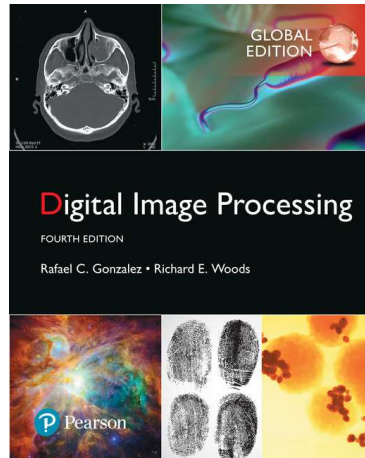
Date	Topics	Textbook
Week 1	Introduction	1.1~1.5
Week 2	Digital Image Fundamentals	2.1~2.6
Week 3	Intensity Transformation and Spatial Filtering (I)	3.1~3.4
Week 4	Intensity Transformation and Spatial Filtering (II)	3.5~3.8
Week 5	Filtering in the Frequency Domain	4.1~4.11
Week 6	Image Restoration and Reconstruction	5.1~5.11
Week 7	Color Image Processing	6.1~6.9
Week 8	Mid-Term Exam	
Week 9	Wavelets and Multiresolution Processing (I)	7.1~7.3
Week 10	Wavelets and Multiresolution Processing (II)	7.4~7.6
Week 11	Image Compression (I)	8.1
Week 12	Image Compression (II)	8.2~8.3
Week 13	Morphological Image Processing	9.1~9.6
Week 14	Image Segmentation	10.1~10.6
Week 15	Representation and Description	11.1~11.5
Week 16	Final Exam	



0.3 Textbook

■ Textbook

Gonzalez, R. C. and R. E. Woods. 2018. “Digital Image Processing”, 4th Ed., Pearson Educational Limited. Edinburgh Gate, England.



0.3 Textbook

■ References

1. Pratt, W. K. 2013. “Introduction to Digital Image Processing”, CRC Press.
2. Sonka, M., V. Hlavac, and R. Boyle. 2014. “Image Processing, Analysis, and Machine Vision”, 4th Ed., Cengage Learning.



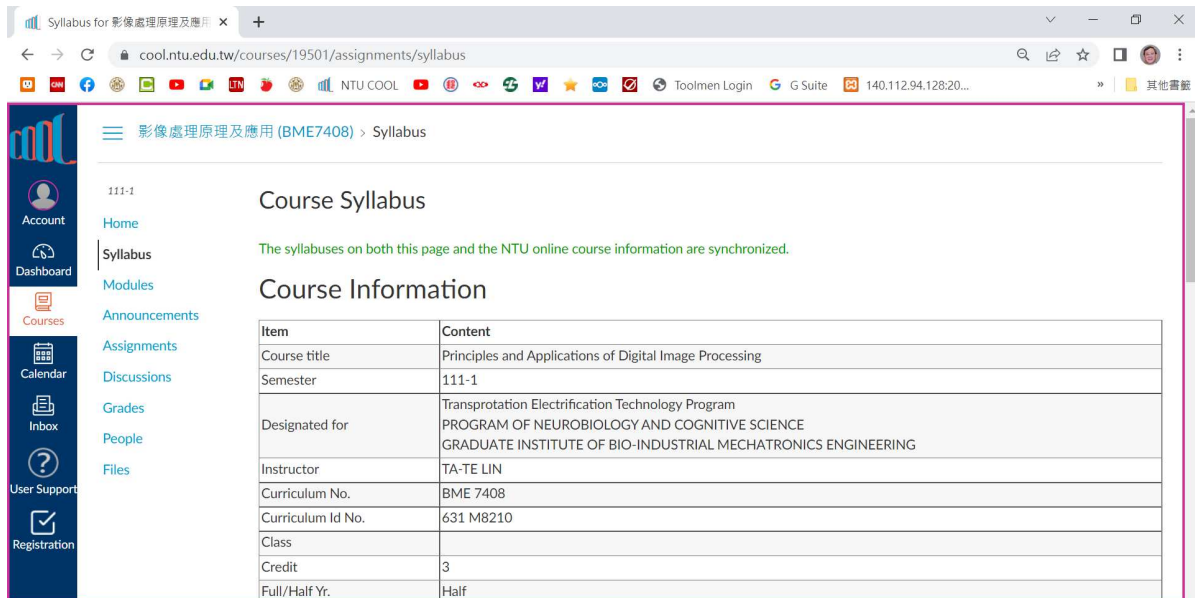
0.4 Grading Policy

■ Homework	40%
■ Mid-Term Exam	20%
■ Final Exam	20%
■ Term Project	20%



0.5 Course Website & Resources

<https://cool.ntu.edu.tw/courses/19501>



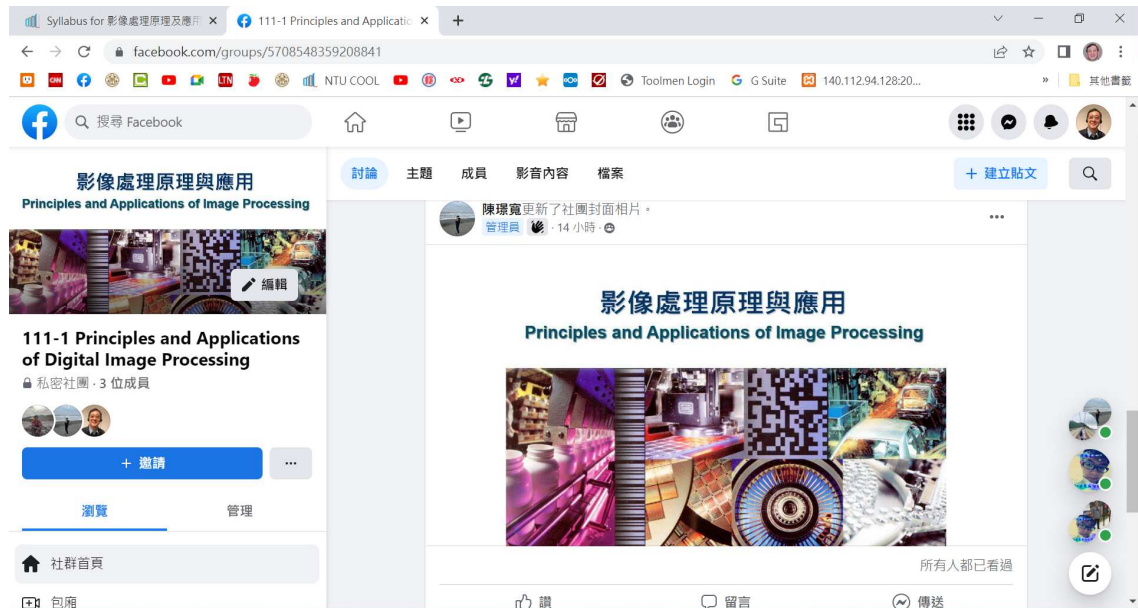
The screenshot shows a web browser displaying the NTU COOL course website. The address bar shows the URL cool.ntu.edu.tw/courses/19501/assignments/syllabus. The page title is "Syllabus for 影像處理原理及應用". The left sidebar contains navigation links: Account, Dashboard, Courses, Calendar, Inbox, User Support, and Registration. The main content area is titled "Course Syllabus" and includes a green message: "The syllabuses on both this page and the NTU online course information are synchronized." Below this is the "Course Information" section, which contains a table with the following data:

Item	Content
Course title	Principles and Applications of Digital Image Processing
Semester	111-1
Designated for	Transprotation Electrification Technology Program PROGRAM OF NEUROBIOLOGY AND COGNITIVE SCIENCE GRADUATE INSTITUTE OF BIO-INDUSTRIAL MECHATRONICS ENGINEERING
Instructor	TA-TE LIN
Curriculum No.	BME 7408
Curriculum Id No.	631 M8210
Class	
Credit	3
Full/Half Yr.	Half



0.5 Course Website & Resources

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0.5 Course Website & Resources

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0.5 Course Website & Resources

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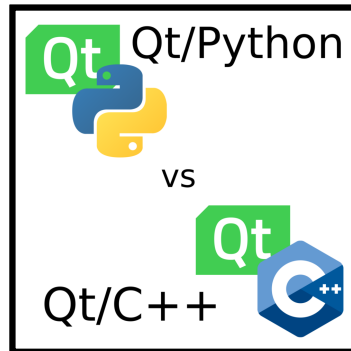
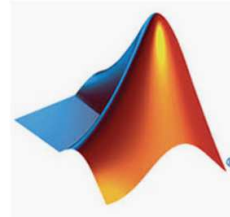
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0.6 Programming Languages

- C++👍
- python
- MATLAB



0.7 Related Courses

