The Hong Kong University of Science and Technology

UG Course Syllabus

[Course Title]: Image Processing

[Course Code]: COMP4421

[No. of Credits]: 3

[Any pre-/co-requisites]

Pre-requisite : (COMP 2011 OR COMP 2012 OR COMP 2012H) AND (MATH 2011 OR MATH 2111 OR MATH 2121 OR MATH 2131 OR MATH 2350 OR MATH 2351 OR MATH 2352)

Exclusion: ELEC 4130, MATH 4336

Name: Hao CHEN

Email: jhc@ust.hk

Course Description

[Briefly describe the course content, key topics or themes, objectives, methods of instruction, e.g., lectures, discussions, projects].

Introduction to image processing. To equip students with the fundamental knowledge of image processing. Topics include image processing and analysis in spatial and frequency domains, image restoration and compression, image segmentation, color image processing, morphological image processing, representation and description, object recognition, related application areas and some other closely related topics. A list of topics includes:

Introduction,

Image Fundamentals,

Image Transformations and Filtering,

Image Restoration and Reconstruction,

Color Image Processing,

Image Compression,

Morphological Image Processing,

Image Segmentation,

Image Registration,

Feature Extraction and Recognition Tasks,

Applications or related topics, e.g., deep learning for medical image analysis.

Assessments:

[List specific assessed tasks, exams, quizzes, their weightage]

Assessment Task	Contribution to Overall Course grade (%)
Mid-Term	30%
Assignments	30%
Final Examination	40%

Required Texts and Materials

[List required textbooks, readings, and any other materials]

This course suggests a list of reference books listed below. No textbook.

Digital Image Processing, by Gonzalez and Woods, 4th Ed., Pearson, 2018.

Digital Image Processing using MATLAB, by Gonzalez and Woods, Prentice Hall, 2004.

The Image Processing Handbook, by John C. Russ (On-line at UST Library).

Digital Image Processing, by Kenneth R. Castleman, Prentice Hall, 1996.

Two-dimensional Signal and Image Processing, by Jae S. Lim, Prentice Hall, 1990.

Computer Vision: A Modern Approach by Forsyth and Ponce, Prentice Hall, 2003.

Toennies, Klaus D. Guide to medical image analysis. Springer London, 2017. Goodfellow, Ian, Yoshua Bengio, and Aaron Courville. Deep learning. MIT press, 2016.

[Optional] Additional Resources

[List any additional resources, such as online platforms, library resources, etc.]

NA.