



# Satuan Acara Pengajaran

EEC410803 - Pengolahan Citra

Pengajar

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## Tujuan Perkuliahan

1. Mengetahui dasar-dasar digital image processing termasuk akuisisi citra (image acquisition), persepsi, transformasi, kompresi, perbaikan (enhancement), interpolasi, restorasi, analisis, dsb. 2. Mampu menggunakan MATLAB untuk melakukan simulasi pengolahan citra tingkat dasar dan familiar dengan fungsi-fungsi yang terdapat pada MATLAB image processing toolbox

## Minggu 1

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<b>Materi</b>	Pengolahan citra, definisi, tinjauan historis pengolahan citra, aplikasi di berbagai bidang (pencitraan sinar Gamma, sinar X, UV, Visible dan IR, gelombang mikro, gelombang radio, modalitas lainnya), langkah dasar pengolahan citra, komponen-komponen pengolahan citra.
<b>Media</b>	OHP, PPT, Video
<b>Referensi</b>	a. R.C. Gonzalez and R.E. Woods, Digital Image Processing, 2nd Ed., Prentice-Hall, 2002. b. R.C. Gonzalez, R.E. Woods, S.L. Eddins, Digital Image Processing using MATLAB, Prentice-Hall, 2004.

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## Aktivitas

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## Minggu 2

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<b>Materi</b>	Dasar-dasar citra digital, sistem persepsi visual mata manusia, spektrum elektromagnetik, dasar-dasar pencitraan (imaging), sensor citra, akuisisi, citra sebagai matriks, pencuplikan dan kuantisasi citra, hubungan dasar antar piksel, operasi linier dan nonlinier
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**Media** PPT, MATLAB, Video

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**Referensi** a. R.C. Gonzalez and R.E. Woods, Digital Image Processing, 2nd Ed., Prentice-Hall, 2002.  
b. R.C. Gonzalez, R.E. Woods, S.L. Eddins, Digital Image Processing using MATLAB, Prentice-Hall, 2004.

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**Aktivitas**

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### Minggu 3

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**Materi** Perbaikan mutu citra dalam domain spasial, transformasi dasar tingkat keabuan (gray level), pengolahan histogram, perbaikan mutu dengan operasi aritmetik/logik, dasar filter digital, filter penghalus, penajam, kombinasi metode perbaikan

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**Media** PPT, Video, MATLAB

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**Referensi** a. R.C. Gonzalez and R.E. Woods, Digital Image Processing, 2nd Ed., Prentice-Hall, 2002.  
b. R.C. Gonzalez, R.E. Woods, S.L. Eddins, Digital Image Processing using MATLAB, Prentice-Hall, 2004.

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**Aktivitas**

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### Minggu 4

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**Materi** Perbaikan mutu citra dalam domain frekuensi, pengenalan domain frekuensi dan transformasi Fourier, filter penghalus dan penajam dalam domain frekuensi, filter homomorphic, implementasi perbaikan mutu menggunakan transformasi Fourier, FFT

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**Media** PPT, Video, MATLAB

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**Referensi** a. R.C. Gonzalez and R.E. Woods, Digital Image Processing, 2nd Ed., Prentice-Hall, 2002.  
b. R.C. Gonzalez, R.E. Woods, S.L. Eddins, Digital Image Processing using MATLAB, Prentice-Hall, 2004.

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**Aktivitas**

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### Minggu 5

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**Materi** Restorasi citra, model degradasi, proses restorasi, model derau (noise), restorasi citra berderau menggunakan filter spasial, reduksi derau periodik menggunakan filter domain frekuensi, degradasi linier, estimasi fungsi degradasi, filter invers, filter Wiener, filter constrained least squares, filter rata-rata geometrik, transformasi geometrik

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**Media** PPT, Video, MATLAB

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**Referensi** a. R.C. Gonzalez and R.E. Woods, Digital Image Processing, 2nd Ed., Prentice-Hall, 2002.  
b. R.C. Gonzalez, R.E. Woods, S.L. Eddins, Digital Image Processing using MATLAB, Prentice-Hall, 2004.

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**Aktivitas**

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## Minggu 6

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**Materi** Pengolahan citra berwarna, dasar-dasar warna, model-model warna, pengolahan citra pseudocolor, dasar pengolahan citra berwarna, transformasi warna, penajaman dan penghalusan, segmentasi warna, derau pada citra berwarna, kompresi warna

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**Media** PPT, Video, MATLAB

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**Referensi** a. R.C. Gonzalez and R.E. Woods, Digital Image Processing, 2nd Ed., Prentice-Hall, 2002.  
b. R.C. Gonzalez, R.E. Woods, S.L. Eddins, Digital Image Processing using MATLAB, Prentice-Hall, 2004.

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**Aktivitas**

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## Minggu 7

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**Materi** Ujian Tengah Semester

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**Media**

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**Referensi**

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**Aktivitas**

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## Minggu 8

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**Materi** Kompresi citra, dasar-dasar pengodean, model kompresi citra, elemen-elemen teori informasi, kompresi nirgalat (error-free), kompresi bergalat (lossy), standar kompresi citra

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**Media** PPT, Video, MATLAB

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**Referensi** a. R.C. Gonzalez and R.E. Woods, Digital Image Processing, 2nd Ed., Prentice-Hall, 2002.  
b. R.C. Gonzalez, R.E. Woods, S.L. Eddins, Digital Image Processing using MATLAB, Prentice-Hall, 2004.

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**Aktivitas**

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## Minggu 9

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**Materi** Pengolahan citra morfologis, konsep dasar, dilasi dan erosi, pembukaan dan penutupan, transformasi Hit-or-Miss, beberapa algoritma morfologis dasar, pengolahan pada citra berskala keabuan.

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**Media** PPT, Video, MATLAB

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**Referensi** a. R.C. Gonzalez and R.E. Woods, Digital Image Processing, 2nd Ed., Prentice-Hall, 2002.  
b. R.C. Gonzalez, R.E. Woods, S.L. Eddins, Digital Image Processing using MATLAB, Prentice-Hall, 2004.

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**Aktivitas**

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## Minggu 10

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**Materi** Segmentasi citra, deteksi diskontinuitas, hubungan tepi dan deteksi batas, thresholding, segmentasi berbasis wilayah, segmentasi menggunakan watershed morfologis, penggunaan gerakan dalam segmentasi

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**Media** PPT, Video, MATLAB

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**Referensi** a. R.C. Gonzalez and R.E. Woods, Digital Image Processing, 2nd Ed., Prentice-Hall, 2002.  
b. R.C. Gonzalez, R.E. Woods, S.L. Eddins, Digital Image Processing using MATLAB, Prentice-Hall, 2004.

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**Aktivitas**

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## Minggu 11

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**Materi** Representasi dan deskripsi, pengertian representasi, deskripsi batas, deskripsi wilayah, penggunaan komponen pokok dalam deskripsi, deskripsi relasional

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**Media** PPT, Video, MATLAB

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**Referensi** a. R.C. Gonzalez and R.E. Woods, Digital Image Processing, 2nd Ed., Prentice-Hall, 2002.  
b. R.C. Gonzalez, R.E. Woods, S.L. Eddins, Digital Image Processing using MATLAB, Prentice-Hall, 2004.

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**Aktivitas**

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## Minggu 12

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**Materi** Pengenalan obyek, pola dan kelas-kelasnya, pengenalan berbasis metode teori keputusan (pencocokan, pengkelasan statistik optimum, jaringan syaraf tiruan), metode struktural

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**Media** PPT, Video, MATLAB

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**Referensi** a. R.C. Gonzalez and R.E. Woods, Digital Image Processing, 2nd Ed., Prentice-Hall, 2002.  
b. R.C. Gonzalez, R.E. Woods, S.L. Eddins, Digital Image Processing using MATLAB, Prentice-Hall, 2004.

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**Aktivitas**

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## Minggu 13

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**Materi** Perkembangan Wavelet dan sejarahnya, pentingnya transformasi, wavelet, komponen basis, contoh-contoh, Fast Wavelet Transform, filter Wavelet, keuntungan-keuntungan Wavelet.

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**Media** PPT, Video, MATLAB

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**Referensi** a. R.C. Gonzalez and R.E. Woods, Digital Image Processing, 2nd Ed., Prentice-Hall, 2002.  
b. R.C. Gonzalez, R.E. Woods, S.L. Eddins, Digital Image Processing using MATLAB, Prentice-Hall, 2004.

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**Aktivitas**

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## Minggu 14

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**Materi** Morfologi citra, operasi: Dilasi, Erosi, Opening, Closing , Thinning, shrinking, pruning, thickening, skeletonizing. Hit-or-miss transform, beberapa variasi operasi.

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**Media** PPT, Video, MATLAB

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**Referensi** a. R.C. Gonzalez and R.E. Woods, Digital Image Processing, 2nd Ed., Prentice-Hall, 2002.  
b. R.C. Gonzalez, R.E. Woods, S.L. Eddins, Digital Image Processing using MATLAB, Prentice-Hall, 2004.

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**Aktivitas** Kuliah, diskusi, demo

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## Minggu 15

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**Materi** Transformasi Wavelet, operasi dasar, macam-macam Wavelet, kegunaan, contoh aplikasi.

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**Media** PPT, Video, MATLAB

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b. R.C. Gonzalez, R.E. Woods, S.L. Eddins, Digital Image Processing using MATLAB, Prentice-Hall, 2004.

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**Aktivitas** Kuliah, diskusi, demo

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## Minggu 16

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**Materi** Ujian Akhir Semester

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**Media**

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**Referensi**

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**Aktivitas**

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