

21B33C407 – Digital Image Processing

Module designation	Digital Image Processing (Undergraduate)
Semester(s) in which the module is taught	4 th
Person responsible for the module	Dr. Mustari Lamada, M.T.
Language	Indonesia – English
Relation to curriculum	This course is a compulsory course
Teaching methods	Lecture, Presentation
Workload (incl. contact hours, self-study hours)	CH: 09.00-17.00 Face to face: 2x50 minutes / week Independent Study: 2x50 minutes / week Structured assignment: 2x50 minutes / week
Credit points	2 SKS (equivalent 3.4 ECTS)
Required and recommended prerequisites for joining the module	Algorithms and Basic programming, Advanced programming, Algorithm Analysis
Module objectives/intended learning outcomes	Program Learning Outcomes (PLO) PLO 3: Demonstrate a responsible attitude towards work in their field of expertise independently PLO 7: Able to apply logical, critical, systematic and innovative thinking in the context of science development or implementation knowledge and technology that pays attention to and applies humanities values in accordance with their field of expertise; PLO 7: Able to make appropriate decisions in the context of solving problems in their field of expertise, based on the results of analysis information and data; PLO 5: Students master analysis techniques, design/modeling methods and artificial intelligence algorithms in solving a problem. PLO 10: Planning, Designing, Implementing, and Analyzing Artificial Intelligence Algorithms to Solve a Problem. Course Learning Objectives (CLO) The Digital Image Processing course is a course that studies processing techniques (manipulating or modifying)

	two-dimensional images via computer. Real applications of digital image processing such as pattern recognition, remote sensing, and machine/computer vision. Sub CLO: Sub-CLO 1: Students are able to understand and explain visual perception and digital images Sub-CLO 2: Students are able to understand and apply the basics of digital image processing Sub-CLO 3: Students are able to understand and apply pixel and histogram operations Sub-CLO 4: Students are able to understand geometric operations Sub-CLO 5: Students are able to understand and apply image quality improvement techniques in the spatial domain in digital image processing Sub-CLO 6 Students are able to understand and apply color image processing techniques Sub-CLO 7 Students are able to understand and apply digital image restoration, warping and zooming techniques Sub-CLO 8 Students are able to understand and apply image segmentation techniques Sub-CLO 9 Students are able to understand and apply morphological operations for image processing Sub-CLO 10 Students are able to understand and apply operations on binary images SUB-CLO 11 Students are able to understand and apply shape, contour and texture feature extraction Sub-CLO 12 Students are able to understand and apply the image retrieval system
Content	Students will learn about: • Introduction to Digital Image Processing • Spatial domain image enhancement • Pixel and histogram operations • Geometric operations • Image enhancement • Color image processing • Image restoration • Segmentation • Morphology • Operations on binary images • Features of shape, contour and texture • Digital image retrieval system
Examination forms	Assessment Techniques: Exam, Presentation, Case Based Learning Assessment Forms: Assignment, Presentation Assessment
Study and examination requirements	• Students have to inform the lecturer when they are not able to attend the class due to sickness etc • Active in making projects by showing participation in making projects in class

	• Able to present and answer questions that exist during project presentations
Reading List	• Gonzales, R. C. (1992). RE Woods digital image processing. MA: Addison-Wesley. • Gonzalez, R. C., Woods, R. E., & Eddins, S. L. (2004). Digital image processing using MATLAB. Pearson Education India. • Kadir, A., & Susanto, A (2013). Teori dan Aplikasi Pengolahan Citra. Andi. Yogyakarta. • Prasetyo, E. (2014). Data Mining Mengolah Data Menjadi Informasi Menggunakan Matlab. Andi.Yogyakarta • Prasetyo, E. (2011). Pengolahan Citra Digital dan Aplikasinya Menggunakan Matlab. Andi.Yogyakarta • Sianipar, R.H., Mangiri, H.S., & Wiryajati, I.K. (2013). Matlab untuk Pemrosesan Citra Digital. Informatika. Bandung.