No	Information of subject	
1	Unit name:	Machine Vision
2	Code:	McE 51051
3	Classification:	Engineering subject
4	Credit value:	2
5	Semester/ Year Offered:	1/5
6	Pre-requisite:	NA
7	Mode of delivery:	Lecture, Tutorial
8	Assessment system and breakdown of marks:	Tutorials
	Mid-term	35%
	Tutorial	15%
9	Academic staff teaching unit:	Department of Mechatronic Engineering
10	Course outcome of unit: In this course, students will be able (a) To know the terms of machine vision (b) To know the mathematical methods used in machine vision (c) To develop the image processing process using the image file system software (d) To analysis the useful image processing techniques	
11	Synopsis of unit: The course introduces students to the study of the Machine Vision using six chapters. Chapter 1 covers introductory information about Machine Vision. This includes computer software tools, the important terms of image processing and machine vision, organization of machine vision system and nature of images. Chapter 2 reviews the mathematical methods such as probability, linear algebra, function minimization and Markov models. Chapter 3 includes image file system used in image processing and good programming styles. Chapter 5 discusses linear operator, kernel operator, derivative estimation by function fitting, vector representations of images, basis vectors for images, edge detection, A kernel as a sampled differentiable function, computing convolutions, scale space and quantifying the accuracy of an edge detector. Chapter 6 discusses the restoration and feature extraction of image relaxation. Machine vision can be applied in the field of security system,	

	biotechnological field, medical field, robotic field and any other various applications.
12	Topic: **1 Introduction** 1.1 Concerning this book 1.2 Concerning prerequisites 1.3 Some terminology 1.4 Organization of a machine vision system 1.5 The nature of images 1.6 Images: Operations and analysis **2 Review of mathematical principles** 2.1 A brief review of probability 2.2 A review of linear algebra 2.3 Introduction to function minimization 2.4 Markov models **3 Writing programs to process images** 3.1 Image File System (IFS) software 3.2 Basic programming structure for image processing 3.3 Good programming styles 3.4 Example programs 3.5 Make files **5 Linear operators and kernels** 5.1 What is a linear operator? 5.2 Application of kernel operators in digital images 5.3 Derivative estimation by function fitting 5.4 Vector representations of images 5.5 Basis vectors for images 5.6 Edge detection 5.7 A kernel as a sampled differentiable function 5.8 Computing convolutions 5.9 Scale space 5.10 Quantifying the accuracy of an edge detector 5.11 So how do people do it? 5.12 Conclusion

	5.13Vocabulary **6 Image relaxation: Restoration and feature extraction** 6.1 Relaxation 6.2 Restoration 6.3 The MAP approach 6.4 Mean field annealing 6.5 Conclusion 6.6 Vocabulary
13	Main references: Machine vision (2004, Cambridge University Press), Wesley E Snyder and Hairong Qi.
14	Additional references: