

No	Information of IT 51037	
1	Unit name	Digital Image Processing
2	Code:	IT 51037
3	Classification	Engineering Subject
4	Credit value:	3
5	Semester/Year Offered:	1/V
6	Pre-requisite:	Basic Matlab Skill
7	Mode of delivery:	Lecture, Practical, Tutorial
8	Assessment system and breakdown of marks: Practical, Tutorial	30%
	Mid-term/ final Examination	70%
9	Academic staff teaching unit:	Department of Information Technology Engineering
10	<p>Course outcome of unit: In this course, students will be able</p> <p>(a) To discuss the basic theory of the Digital Image Processing concepts and their application areas.</p> <p>(b) To develop thinking about manipulation of digit images, especially image acquisition, image enhancement and restoration.</p> <p>(c) To develop hand-on experience in using computer to process digital image.</p>	
11	<p>Synopsis of Unit: VIT-51037, Digital Image Processing, this course is designed to give undergraduate student all fundamentals in 2D digital image processing techniques. This course also introduces element of visual perception, image sampling and quantization, linear and nonlinear operations, image enhancement in spatial domain and frequency domain and image restoration. Several feature of this test are design to make it particular easy for students to understand digital image processing using MATLAB. There are review questions, exercises and research activities at the end of all chapters to enhance the book's usefulness in the classroom.</p>	
12	<p>Topics:</p> <p>1.Introduction</p> <ul style="list-style-type: none"> • What is Digital Image Processing • The Origins of Digital Image Processing • Example of Fields that Use Digital Image Processing • Summary • Exercise <p>2. Digital Image Fundamentals</p> <ul style="list-style-type: none"> • Elements of Visual Perception • Light and the Electromagnetic Spectrum • Image Sensing and Acquisition • Image Sampling and Quantization • Some Basic Relationships Between Pixels • Linear and Nonlinear Operations • Summary • Exercise 	

3. Image Enhancement in the Spatial Domain

- Background
- Some Basic Gray-Level Transformations
- Histogram Processing
- Enhancement Using Arithmetic/Logic Operations
- Basics of Spatial Filtering
- Smoothing Spatial Filters
- Sharpening Spatial Filters
- Combining Spatial Enhancement Methods
- Summary
- Exercise

4. Image Enhancement in the Frequency Domain

- Background
- Introduction to the Fourier Transform and the Frequency Domain
- Smoothing Frequency-Domain Filters
- Sharpening Frequency Domain Filters
- Homomorphic Filtering
- Implementation
- Summary
- Exercise

5. Image Restoration

- Restoration in the Presence of Noise Only-Spatial Filtering
- Periodic Noise Reduction by Frequency Domain Filtering
- Linear, Position-Invariant Degradations
- Estimating the Degradation Function
- Inverse Filtering
- Minimum Mean Square Error (Wiener) Filtering
- Constrained Least Squares Filtering
- Geometric Mean Filter
- Geometric Transformations
- Summary
- Exercise