Written by Administrator Saturday, 07 November 2009 06:08 -

## **Operating Systems**

Subject Code			:
		-	
IA Marks	: 25		

No. of Lecture Hrs/Week	: 04

	i	
Exam Hours		: 03

Total	no. of Lecture Hrs.	: 52

Exam Marks	: 100

## PART - A

## Unit - 1

Written by Administrator Saturday, 07 November 2009 06:08 -

**Introduction And Overview Of Operating Systems:** Operating system, Goals of an O.S, Operation of an O.S, Resource allocation and related functions, User interface related functions, Classes of operating systems, O.S and the computer system, Batch processing system, Multi programming systems, Time sharing systems, Real time operating systems, distributed operating systems.

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7 Hours
Unit - 2
<b>Structure of the Operating Systems:</b> Operation of an O.S, Structure of the supervisor, Configuring and installing of the supervisor, Operating system with monolithic structure, layered design, Virtual machine operating systems, Kernel based operating systems, and Microkernel based operating systems.
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7 Hours
Unit - 3

**Process Management:** Process concept, Programmer view of processes, OS view of processes, Interacting processes, Threads, Processes in UNIX, Threads in Solaris

2 / 42

Written by Administrator

Saturday, 07 November 2009 06:08 -
6 Hours
Unit - 4
<b>Memory Management:</b> Memory allocation to programs, Memory allocation preliminaries, Contiguous and noncontiguous allocation to programs, Memory allocation for program controlled data, kernel memory allocation.
6 Hours
PART - B
Unit - 5
<b>Virtual Memory:</b> Virtual memory basics, Virtual memory using paging, Demand paging, Page replacement, Page replacement policies, Memory allocation to programs, Page sharing, UNIX virtual memory.

Unit - 8

Written by Administrator Saturday, 07 November 2009 06:08 -
6 Hours
Unit - 6
<b>File Systems:</b> File system and IOCS, Files and directories, Overview of I/O organization, Fundamental file organizations, Interface between file system and IOCS, Allocation of disk space, Implementing file access, UNIX file system.
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7 Hours
Unit - 7
<b>Scheduling:</b> Fundamentals of scheduling, Long-term scheduling, Medium and short term scheduling, Real time scheduling, Process scheduling in UNIX.
7 Hours

Written by Administrator Saturday, 07 November 2009 06:08 -

<b>Message Passing:</b> Implementing message passing, Mailboxes, Inter process communication in UNIX.
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6 Hours
Text book:
1. "Operating Systems - A Concept based Approach", D. M. Dhamdhare, TMH, 2 <sup>nd</sup> Ed, 2006.
Reference book:
<ol> <li>Operating Systems Concepts, Silberschatz and Galvin, John Wiley, 5<sup>th</sup> Edition, 2001.</li> <li>Operating System – Internals and Design Systems, Willaim Stalling, Pearson Education, 4</li> </ol>

Written by Administrator Saturday, 07 November 2009 06:08 -

## **PATTERN RECOGNITION**

Subject Code		:	
	,	<u>'</u>	
IA Marks	: 25		
No. of Lecture Hrs/W	eek	:	04
Exam Hours	: 03		
Total no. of Lecture F	łrs.	:	52
Exam Marks	: 100		

## PART - A

## Unit - 1

Written by Administrator Saturday, 07 November 2009 06:08 -

<b>Introduction:</b> Applications of pattern recognition, statistical decision theory, image processing and analysis.
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4 Hours
Unit - 2
<b>Probability:</b> Introduction, probability of events, random variables, Joint distributions and densities, moments of random variables, estimation of parameters from samples, minimum risk estimators.
7 Hours
Unit - 3
<b>Statistical Decision Making:</b> Introduction, Baye's Theorem, multiple features, conditionally independent features, decision boundaries, unequal costs of error, estimation of error rates, the leaving-one-out technique. Characteristic curves, estimating the composition of populations.
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Written by Administrator Saturday, 07 November 2009 06:08 -
7 Hours
Unit - 4
<b>Nonparametric Decision Making:</b> Introduction, histograms, Kernel and window estimators, nearest neighbor classification techniques, adaptive decision boundaries, adaptive discriminate Functions, minimum squared error discriminate functions, choosing a decision making technique.
8 Hours
PART - B
Unit - 5
Clustering: Introduction, hierarchical clustering, partitional clustering.
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7 Hours

Written by Administrator
Saturday, 07 November 2009 06:08 -

Unit - 6

**Artificial Neural Networks:** Introduction, nets without hidden layers, nets with hidden layers, the back Propagation algorithms, Hopfield nets, an application.

7 Hours

Unit - 7

**Processing of Waveforms and Images:** Introduction, gray level sealing transfoniiations, equalization, geometric image and interpolation, Smoothing, transformations,

edge detection, Laplacian and sharpening operators, line detection and template matching, logarithmic gray level sealing, the statistical significance of image features.

No. of

Written by Administrator Saturday, 07 November 2009 06:08 -

R	e	fei	rer	1CE	R(	S	KS:

1. "Pattern and Steve Joust,	Recognition and Prentice-Hall of	I Image Analysis", India-2003.	Eart Gose, Richa	ard Johnsonburg
2. "Pattern 3. "Pattern Schalkoff, John V	recognition: Sta	tern recognition a so tistical, Structural an		
Artificial Neural	Networks			
Artinolar Rodra				
Subject Code				
Subject Code				:
IA Marks		: 25	]	

Exam Hours	: 03

Lecture Hrs/Week

: 04

Written by Administrator Saturday, 07 November 2009 06:08 -

Total no. of Lecture Hrs.	: 52

Exam Marks		: 100
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### PART - A

### Unit - 1

Introduction, history, structure and function of single neuron, neural net architectures, neural learning, use of neural networks.

### 7 Hours

### Unit - 2

Supervised learning, single layer networks, perceptions, linear separability, perceptions training algorithm, guarantees of success, modifications.

Written by Administrator Saturday, 07 November 2009 06:08 -
6 Hours
Unit - 3
Multiclass networks-I, multilevel discrimination, preliminaries, back propagation, setting parameter values, theoretical results.
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6 Hours
Unit - 4
Accelerating learning process, application, mandaline, adaptive multilayer networks.
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Written by Administrator Saturday, 07 November 2009 06:08 -

### PART - B

### Unit - 5

Prediction networks, radial basis functions, polynomial networks, regularization, unsupervised learning, winner take all networks.

### 6 Hours

### Unit - 6

Learning vector quantizing, counter propagation networks, adaptive resonance theorem, toplogically organized networks, distance based learning, neo-cognition.

### 6 Hours

### Unit - 7

Associative models, hop field networks, brain state networks, Boltzmann machines, hetero associations.

Written by Administrator Saturday, 07 November 2009 06:08 -
7 Hours
Unit - 8
Optimization using hop filed networks, simulated annealing, random search, evolutionary computation.
6 Hours
Text book:
1. <b>Elements of Artificial Neural Networks</b> , Kishan Mehrotra, C. K. Mohan, Sanjay Ranka, Penram, 1997.

Written by Administrator Saturday, 07 November 2009 06:08 -

### Reference Books:

<ol> <li>Artificial Neural Networks, R. Schalk</li> </ol>	off, MGH	. 1997.
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- 2. Introduction to Artificial Neural Systems, J. Zurada, Jaico, 2003.
- 3. Neural Networks, Haykins, Pearson Edu., 1999.

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	Subject Code		:
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Written by Administrator Saturday, 07 November 2009 06:08 -

Saturday, 07 November 2009 06:08 -			
A Marks	: 25		
No. of Lecture Hrs/Week		: 04	
Exam Hours	: 03		
Total no. of Lecture Hrs.		: 52	

Exam Marks	: 100

### PART - A

### **Unit - 1&2**

Introduction to VLSI Methodologies: VLSI Physical Design Automation - Design and Fabrication of VLSI Devices - Fabrication process and its impact on Physical Design.

Saturday, 07 November 2009 06:08 -
13 Hours
Unit – 3&4
A Quick Tour of VLSI Design Automation Tools: Data structures and Basic Algorithms, Algorithmic Graph theory and computational complexity, Tractable and Intractable problems.
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13 Hours
PART B
Unit – 5&6
<b>General purpose methods for combinational optimization:</b> partitioning, floor planning and pin assignment, placement, routing.

Written by Administrator Saturday, 07 November 2009 06:08 -
12 Hours
Unit – 7&8
Simulation-logic synthesis: Verification-High level synthesis - Compaction. Physical Design Automation of FPGAs, MCMS-VHDL-Verilog-Implementation of Simple circuits using VHDL
and Verilog.
14 Hours
Reference Books:
<ol> <li>"Algorithms for VLSI Physical Design Automation", N. A. Shervani, 1999.</li> </ol>
2. "Algorithms for VLSI Design Automation", S. H. Gerez, 1998.

Elective 2		
Written by Administrator Saturday, 07 November 2009 06:08 -		
ATM Networks		
A I W Networks		
Subject Code		:
IA Marks	: 25	
No. of Lecture Hrs/Week		: 04
Exam Hours	: 03	
Total no of Lecture Hrs		. 52

: 100

Exam Marks

Written by Administrator Saturday, 07 November 2009 06:08 -
PART- A
Unit - 1
<b>Transfer Modes:</b> Overview of ATM, Introduction, Circuit switching, Routing, virtual circuit Switching, Comparison of transfer modes. Motivation for ATM, Basic properties.
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6 Hours
Unit - 2
<b>ATM Reference Model:</b> Core aspects, ATM Networks, Architecture and interfaces, Internetworking, Applications, BISDN and ATM, ATM Standardisation.
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Written by Administrator Saturday, 07 November 2009 06:08 -Unit - 3 ATM Physical Layer: TC sub layer, PMD sub layer, DS1 interface, DS3 interface, E1 Interface, E3 interface, SONET/SDH based interface. 6 Hours Unit - 4 ATM Layer and AAL, ATM cell header at UNI and NNI, ATM layer function, AAL1, AAL2, AAL3/4. 

8 Hours

PART - B

Unit - 5

ATM traffic and traffic management, Traffic parameters, Service parameters, QOS parameters, Service categories, Traffic management, Traffic contact management.

Written by Administrator Saturday, 07 November 2009 06:08 -
6 Hours
Unit - 6
<b>ATM Switching:</b> Introduction, Components, Performance, Measurements, Switching issues, Shared memory architecture, Shared medium architecture, Space division architecture, Switching in ATM.
8 Hours
Unit - 7
<b>ATM Addressing, Signaling and</b> Routing: AISA format, Group addressing, ATM signal protocol stack, SAAL, Routing, PNNI Protocol, PNNI hierarchy, PNNI topology.

Written by Administrator Saturday, 07 November 2009 06:08 -
Caturday, or November 2009 00:00
Unit - 8
ATM Network Management and Security: Standardisation Procedure, Reference model,
OAM Procedure, ILMI, Security object in ATM Security model.
6 Hours
Text Book:
1. ATM Networks, Sumit Kasera and Pankaj Sethi, TMH, 2001.

Written by Administrator Saturday, 07 November 2009 06:08 -

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1. <b>ATM Networks</b> , Rainer Handel, Manfred. N. Huber, Stefan Schroder, 3 <sup>rd</sup>	Edition,
Pearson Education Asia, 2006	

2. Sourcebook of A	ATM and IP	<b>Internetworking</b>	Khalid Ahmed,	Wile	v inter science	, 2002
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## Image Processing

Subject Code	

IA Marks : 25
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Written by Administrator Saturday, 07 November 2009 06:08 -

No. of Lecture Hrs/Week		: 04	
Exam Hours	: 03		
Total no. of Lecture Hrs.		: 52	
- 14	100		
Exam Marks	: 100		
ART - A			
nit - 1			

**Digital Image Fundamentals:** What is Digital Image Processing. fundamental Steps in Digital Image Processing, Components of an Image processing syst em, elements of Visual Perception.

### 6 Hours

### Unit - 2

Written by Administrator Saturday, 07 November 2009 06:08 -

Image Sensing and Acquisition, Image Sampling and Quantization, Some Basic Relationships
between Pixels, Linear and Nonlinear Operations.
6 Hours
Unit - 3
<b>Image Transforms:</b> Two-dimensional orthogonal & unitary transforms, properties of unitary transforms, two dimensional discrete Fourier transform.
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6 Hours
Unit - 4
Discrete cosine transform, sine transform, Hadamard transform, Haar transform, Slant transform, KL transform.

6 Hours

Written by Administrator

Saturday, 07 November 2009 06:08 -6 Hours PART - B Unit - 5 Image Enhancement: Image Enhancement in Spatial domain, Some Basic Gray Level Trans -formations, Histogram Processing, Enhancement Using Arithmetic/Logic Operations. 6 Hours Unit - 6 Basics of Spatial Filtering Image enhancement in the Frequency Domain filters, Smoothing Frequency Domain filters, Sharpening Frequency Domain filters, homomorphic filtering.

Written by Administrator Saturday, 07 November 2009 06:08 -

### Unit - 7

Model of image degradation/restoration process, noise models, Restoration in the Presence of Noise, Only-Spatial Filtering Periodic Noise Reduction by Frequency Domain Filtering, Linear Position-Invariant Degradations,

inverse filtering, minimum mean square error (Weiner) Filtering

### 10 Hours

#### Unit - 8

Color Fundamentals. Color Models, Pseudo color Image Processing., processing basics of full color image processing

Written by Administrator
Saturday, 07 November 2009 06:08 -

### **Text Book:**

1. "**Digital Image Processing**", Rafael C.Gonzalez and Richard E. Woods, Pearson Education, 2001, 2

### **Reference Books:**

- 1. "Fundamentals of Digital Image Processing", Anil K. Jain, Pearson Edun, 2001.
- 2. "Digital Image Processing and Analysis", B. Chanda and D. Dutta Majumdar, PHI, 2003.

Written by Administrator Saturday, 07 November 2009 06:08 -

## APPLIED EMBEDDED SYSTEM DESIGN

Subject Code		:
		·
IA Marks	: 25	
	<u>'</u>	
No. of Lecture Hrs/Week		: 04
		·
Exam Hours	: 03	
EXAM FIGURE	. 00	
Total no. of Lecture Hrs.		: 52
Total Tio. of Lecture Firs.		. 32
Exam Marks	: 100	

## **PART A**

Written by Administrator Saturday, 07 November 2009 06:08 -

### **UNIT - 1**

### INTRODUCTION TO THE EMBEDDED SYSTEMS

An embedded system, Proessor embedded into a system, Embedded hardware units and devices in a system, Embedded software in a system, Examples of embedded systems,

Embedded system-on-chip (soc) and use of vlsi circuits design technology, Complex systems design and processors, Design process in embedded system, Formalism of system design, D esign process and design examples, Classification of embedded systems, Skills required for an embedded system designer.

### 7 Hours

### **UNIT - 2**

### 8051 and Advanced PROCESSOR Architectures

8051 Architecture, Real world interfacing, Introduction to advanced architectures, Processor and Memory organisation, Instruction Level Parallelism, Performance Metrics, Memory types and addresses,

Processor

Name of the American Americ

Selection, Memory

Selection.

Written by Administrator Saturday, 07 November 2009 06:08 -

### UNIT - 3

### **Devices AND Communication Buses for Devices Network**

I/O Types and Examples, Serial Communication Devices, Parallel Port Devices, Sophisticated Interfacing Features in Device Ports,

Wireless Communication Devices, Timer and Counting Devices, Watchdog Timers, Real Time Clocks,

Networking of Embedded Systems, Serial Bus Protocols,

Internet Enabled Systems

Network Protocols, Parallel bus device protocols-

parallel communication network using the isa, pci, pci-x and advanced buses, Wireless and Mobile System Protocols.

### 6 Hours

### **UNIT - 4**

### DEVICE DRIVERS AND INTERRUPTS SERVICING MECHANISM

Port or device access without interrupt servicing mechanism, Interrupt service routine, Thread and device driver concept, Interrupt sources, Interrupt servicing (handling) mechanism, Multiple interrupts, Context and the periods for context-switching, interrupt latency and deadline, Classification of processors interrupt service mechanism from context saving angle, Direct memory access. Device driver programming, Parallel port device drivers in a system. Serial port device drivers in a system, Timer devices and

UNIT - 6

Written by Administrator Saturday, 07 November 2009 06:08 -

devices interrupts, Context and the periods for context-switching, interrupt latency and deadline, C lassification of processors interrupt service mechanism from context saving angle, Direct memory access, Device driver programming, Parallel port device drivers in a system, Serial port devices drivers in a system, Timer devices and devices interrupts.
7 Hours
PART B
UNIT - 5
PROGRAMMING CONCEPTS AND EMBEDDED PROGRAMMING IN C, C++ and Java
Software programming in assembly language (alp) and in high level language 'C', 'C' program elements: header and source files and preprocessor directives, Program elements: macros and functions, Program elements: data types, data structures, modifiers, statements, loops and pointers. Ojected oriented programming, Embedded programming
in C++ , Embedded programming in java, O timization of memory needs.
6 Hours

Written by Administrator Saturday, 07 November 2009 06:08 -

### PROGRAM MODELING CONCEPTS

Program models, Data flow graph models, State machine programming models for event controlled programs, Modeling of multiprocessor systems, UML modeling.

### **REAL TIME OPERATING SYSTEMS**

Multiple processes in an application, Multiple threads in an application, Task

Tasks and states, Tasks and data, Clear cut distinction between Functions, ISRs and Tasks by their Characteristics, Concept of semaphores, Shared data, Inter process communication, Si gnals, Semaphores,

Message Queues, Mailboxes,

**Pipes** 

Sockets. Remote Procedure Calls (RPCs).

Written by Administrator Saturday, 07 November 2009 06:08 -

### **UNIT - 7**

### **REAL TIME OPERATING SYSTEMS**

Process Management, Timer Functions, Event Functions, Memory management, Device, File, and IO Subsystems Management, Interrupt Routines in RTOS environment and handling of interrupt source calls by RTOS, Introduction to Real Time Operating System,

Basic Design Using a Real Time Operating System,

RTOS Task Scheduling Models, Latency, Response Times, Deadline as Performance

Metric.

Latency and Deadlines as Performance Metric in Scheduling Models For Periodic, Sporadic and Aperiodic Tasks,

CPU Load as Performance Metric

, Sporadic Task Model

Performance Metric

. OS SECURITY ISSUES,

IEEE Standard POSIX 1003.1b Functions for Standardisation of RTOS and Inter Process Communication Functions.

### RTOS PROGRAMMING

MicroC/OS-II and VxWorks, Types of real- time operating systems, RTOS mC/OS-II, RTOS VxWorks.

#### 8 Hours

### **UNIT - 8**

Written by Administrator Saturday, 07 November 2009 06:08 -

Design	<b>Examples</b>	and Case	Studies of	<b>PROGRAM</b>	I MODELING	AND Pro	gramming w	vith
RTOS -	<b>1</b> 0000000		00000000	00000000	0000000000		0000000000	00000000
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Case study of coding for an automatic chocolate vending machine using mucos rtos Case study of digital camera case study of coding for sending application layer byte streams on a tcp/ip network using rtos vxworks.

# Design Examples and Case Studies of PROGRAM MODELING AND Programming with RTOS - 1

Case study of orchestra playing robots, Case study of an embedded system for an adaptive cruise control system in a car,

Case study of an embedded system for a smart card, Case study of a mobile phone.

Written by Administrator Saturday, 07 November 2009 06:08 -	
Text Book:	
1.00000 Embedded Systems: Architecture, Programming, and Design,0	

### Reference books:

Raj Kamal, 2<sup>nd</sup> Edn. TMH, 2008.

- 1. Bank Vahid Embedded System Design A certified Hardware / Software Introduction, John Wikey & Sons, 2002.
  - 2. **An** embedded Software Primer by David E Simon, Pearson Edition 1999.

Written by Administrator Saturday, 07 November 2009 06:08 -

## Video Engineering

Subject Code		:
IA Marks	: 25	
No. of Lecture Hrs/Week		: 04
Exam Hours	: 03	
Total no. of Lecture Hrs.		: 52

: 100

## PART - A

Exam Marks

Written by Administrator	
Saturday, 07 November 2009 06:08 -	

## Unit - 1

<b>TV Fundamentals:</b> Block schematic of TV systems, picture characteristics, luminous signal, bandwidth calculation, chromatic signal, composite video signal.
6 Hours
Unit - 2
NTSC, PAL and SECAM Overview: NTSC overview, luminous information, color information, color modulation, composite video generation, color sub-carrier frequency, NTSC standards, RF modulation, stereo audio. PAL overview, luminance information, color information, color modulation, composite video generation, PAL standards, RF modulation, stero audio (analog).
SECAM overview, luminance information, color information, color modulation, composite video generation, SECAM standards, Tele text, Enhanced TV programming.
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Written by Administrator
Saturday, 07 November 2009 06:08 -

### Unit - 3

NTSC and PAL digital encoding – decoding: NTSC & PAL encoding, luminance, Y processing, color difference processing, C modulation, analog C generation, analog composite video, clear encoding, NTSC & PAL decoding.

### 10 Hours

### Unit - 4

**Video conferencing standards:** (H.261 & H.263) - H.261, video coding layers, DCT, IDCT, video bit stream, block layer, still image transmission, H.263, video coding layer, GOB layer, MB layer, optional H.263 modes.

Written by Administrator Saturday, 07 November 2009 06:08 -

PART - B

Unit - 5 & 6

**MPEG 1, 2, 4 and H.261:** Introduction, MPEG vs JPEG, Quality issues, audio overview, vide o coding layer, I P B, D frames, video bit stream, video decoding, real world issues.

**MPEG 2:** Introduction, audio overview, video overview, video coding layer, enhances TV programming, IPMP.

MPEG 4 over MPEG 2, H.264 over MPEG 2, SMPTEVC-9 over MPEG 2, Data broad casting, decoder consideration. MPEG 4 & H.264: Introduction, audio overview, visual overview, Graphic overview, visual layer, object description frame work, scene description, syndronigation of elementary streams, multiplexing, IPMP, MPEG 4 part 10 (H.264) video.

15 Hours

Unit - 7 & 8

**Digital video interfaces:** Pre video component interfaces, consumer component interfaces, consumer transport interfaces.

Written by Administrator Saturday, 07 November 2009 06:08 -

**Digital video processing:** Rounding considerations, SDTV – ADTV Yeber transforms, 4:4:4 to 4:2:2 Yeber conversion, display enhancement, video mixing and graphic overlay.

IPTV: Consideration, multicasting, RTS based solutions, ISMA, Broadcast over IP, DRM.

### 9 Hours

### **Text Book:**

1. **Video Demystified**, Keith Jack, 4<sup>th</sup> Edn, Elsevier, 2007.