JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD.

B. TECH. COMPUTER SCIENCE AND ENGINEERING

IV Year   **II Semester**

COURSE STRUCTURE

Code	Subject	T	P	C	
	Management Science		4+1*	-	4
	ELECTIVE III :		4+1*	-	4
	Image Processing				
	E-Commerce				
	Distributed Databases				
	ELECTIVE – IV :		4+1 *	-	4
	Virtual Reality				
	Human Computer Interaction				
	Design Patterns				
	Industry Oriented Mini Project		-	-	2 2
	Seminar		-	-	10
	Project Work		-	-	
	Comprehensive Viva		-	-	2
	Total		**15**	**-**	**28**

Note :   All End Examinations (Theory and Practical) are of three hours duration.
* - Tutorial
T - Theory
P - Practical
C - Credits

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	4+1*	0	4

MANAGEMENT SCIENCE

Unit - I
Introduction to Management: Concepts of Management and organization- nature, importance and Functions of Management, Taylor's Scientific Management Theory, Fayol's Principles of Management, Mayo's Hawthorne Experiments, Maslow's Theory of Human Needs, Douglas McGregor's Theory X and Theory Y, Herzberg's Two-Factor Theory of Motivation, Systems Approach to Management, Leadership Styles, Social responsibilities of Management.

Unit - II
Designing Organisational Structures : Basic concepts related to Organisation - Departmentation and Decentralisation, Types of mechanistic and organic structures of organisation (Line organization, Line and staff organization, functional organization, Committee organization, matrix organization, Virtual Organisation, Cellular Organisation, team structure, boundaryless organization, inverted pyramid structure, lean and flat
organization structure) and their merits, demerits and suitability.

Unit - III
Operations Management : Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement-Statistical Quality Control: chart, R chart, c chart, p chart, (simple Problems), Acceptance Sampling, Deming's contribution to quality.

Unit - VI
a) Materials Management: Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records.
b) Marketing: Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life Cycle, Channels of distribution

Unit - V
Human Resources Management (HRM) : Concepts of HRM, HRD and Personnel Management and Industrial Relations (PMIR), HRM vs.PMIR, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Placement, Wage and Salary Administration,
Promotion, Transfer, Separation, Performance Appraisal, Grievance Handling and Welfare Administration, Job Evaluation and Merit Rating.

Unit - VI
Project Management *(PERT/CPM)* **:** Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing. (simple problems)

Unit - VII
Strategic Management : Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, Value Chain Analysis, SWOT Analysis, Steps in Strategy Formulation and Implementation, Generic Strategy alternatives.

Unit - VIII
Contemporary Management Practices : Basic concepts of MIS, End User Computing, Materials Requirement Planning (MRP), Just-In-Time (JIT) System, Total Quality Management (TQM), Six sigma and Capability Maturity Model (CMM) Levels, Supply Chain Management, Enterprise Resource Planning (ERP), Performance Management, Business Process outsourcing (BPO), Business Process Re-engineering and Bench Marking, Balanced Score Card.

TEXT BOOKS :
1. Aryasri : *Management Science*, TMH, 2004.
2. Stoner, Freeman, Gilbert, *Management*, 6th Ed, Pearson Education, New Delhi, 2004.

REFERENCES :
1. Kotler Philip & Keller Kevin Lane: Marketing Mangement 12/e, PHI, 2005
2. Koontz & Weihrich: Essentials of Management, 6/e, TMH, 2005
3. Thomas N.Duening & John M.Ivancevich Management — Principles and Guidelines, Biztantra,2003.
4. Kanishka Bedi, *Production and Operations Management*, Oxford University Press, 2004.
5. Memoria & S.V.Gauker, *Personnel Management*, Himalaya, 25/e, 2005
6. Samuel C.Certo: *Modern Management*, 9/e, PHI, 2005
7. Schermerhorn, Capling, Poole & Wiesner: *Management*, Wiley, 2002.
8. Parnell: Strategic Management, Biztantra,2003.
9. Lawrence R Jauch, R.Gupta &William F.Glueck:Business Policy and Strategic Management, Frank Bros.2005.
10. L.S.Srinath: PERT/CPM,Affiliated East-West Press, 2005.

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IMAGE PROCESSING
(ELECTIVE III)

UNIT - I
Introduction : Examples of fields that use digital image processing, fundamental steps in digital image processing, components of image processing system.. Digital Image Fundamentals: A simple image formation model, image sampling and quantization, basic relationships between pixels (p.nos. 15-17, 21- 44, 50-69).

UNIT - II
Image enhancement in the spatial domain : Basic gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening spatial
filters, combining the spatial enhancement methods (p.nos 76-141).

UNIT - III
Image restoration : A model of the image degradation/restoration process, noise models, restoration in the presence of noise–only spatial filtering, Weiner filtering, constrained least squares filtering, geometric transforms; Introduction to the Fourier transform and the frequency domain, estimating the degradation function (p.nos 147-167, 220-243, 256-276).

UNIT - IV
Color Image Processing : Color fundamentals, color models, pseudo color image processing, basics of full–color image processing, color transforms, smoothing and sharpening, color segmentation (p.nos: 282- 339).

UNIT - V
Image Compression : Fundamentals, image compression models, error-free compression, lossypredictive coding, image compression standards (p.nos: 409-467,492-510).

UNIT - VI
Morphological Image Processing : Preliminaries, dilation, erosion, open and closing, hit or miss transformation, basic morphologic algorithms (p.nos:519-550).

UNIT - VII
Image Segmentation : Detection of discontinuous, edge linking and boundary detection, thresholding, region–based segmentation (p.nos: 567-617).

UNIT - VIII
Object Recognition : Patterns and patterns classes, recognition based on decision–theoretic methods, matching, optimum statistical classifiers, neural networks, structural methods – matching shape numbers, string matching (p.nos: 693-735).

TEXT BOOK :
1. Digital Image Processing, Rafeal C.Gonzalez, Richard E.Woods, Second Edition, Pearson Education/PHI.

REFERENCES :
1. Image Processing, Analysis, and Machine Vision, Milan Sonka, Vaclav Hlavac and Roger Boyle, Second Edition, Thomson Learning.
2. Introduction to Digital Image Processing with Matlab, Alasdair McAndrew, Thomson Course Technology
3. Computer Vision and Image Processing, Adrian Low, Second Edition, B.S.Publications
4. Digital Image Processing using Matlab, Rafeal C.Gonzalez, Richard E.Woods, Steven L. Eddins, Pearson Education.
5. Digital Image Processing, William K. Prat, Wily Third Edition
6. Digital Image Processing and Analysis, B. Chanda, D. Datta Majumder, Prentice Hall of India, 2003.

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E - COMMERCE
(ELECTIVE - III)

UNIT - I
Electronic Commerce-Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications.

UNIT - II
Consumer Oriented Electronic commerce - Mercantile Process models.

UNIT - III
Electronic payment systems - Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems.

UNIT-IV
Inter Organizational Commerce - EDI, EDI Implementation, Value added networks.

UNIT - V
Intra Organizational Commerce - work Flow, Automation Customization and internal Commerce, Supply chain Management.

UNIT - VI
Corporate Digital Library - Document Library, digital Document types, corporate Data Warehouses. Advertising and Marketing - Information based marketing, Advertising on Internet, on-line marketing process, market research.

UNIT - VII
Consumer Search and Resource Discovery - Information search and Retrieval, Commerce Catalogues, Information Filtering.

UNIT - VIII
Multimedia - key multimedia concepts, Digital Video and electronic Commerce, Desktop video processings, Desktop video conferencing.

TEXT BOOK :
1. Frontiers of electronic commerce – Kalakata, Whinston, Pearson.

REFERENCES :
1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley.
2. E-Commerce, S.Jaiswal – Galgotia.
3. E-Commerce, Efrain Turbon, Jae Lee, David King, H.Michael Chang.
4. Electronic Commerce – Gary P.Schneider – Thomson.
5. E-Commerce – Business, Technology, Society, Kenneth C.Taudon, Carol Guyerico Traver.

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DISTRIBUTED DATABASES
(ELECTIVE - III)

UNIT - I
Features of Distributed versus Centralized Databases, Principles Of Distributed Databases , Levels Of Distribution Transparency, Reference Architecture for Distributed Databases , Types of Data Fragmentation,
Integrity Constraints in Distributed Databases.

UNIT – II
Translation of Global Queries to Fragment Queries, Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric
Queries.

UNIT – III
Optimization of Access Strategies, A Framework for Query Optimization, Join Queries, General Queries.

UNIT – IV
The Management of Distributed Transactions, A Framework for Transaction Management , Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions.

UNIT - V
Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

UNIT – VI
Reliability, Basic Concepts, Nonblocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart, Distributed Database Administration, Catalog Management in Distributed Databases, Authorization and Protection

UNIT - VII
Architectural Issues, Alternative Client/Server Architectures, Cache Consistency Object Management, Object Identifier Management, Pointer Swizzling, Object Migration, Distributed Object Storage, Object Query Processing, Object Query Processor Architectures, Query Processing Issues, Query Execution , Transaction Management, Transaction Management in Object DBMSs , Transactions as Objects.

UNIT - VIII
Database Integration, Scheme Translation, Scheme Integration, Query Processing Query Processing Layers in Distributed Multi-DBMSs, Query Optimization Issues. Transaction Management Transaction and Computation Model Multidatabase Concurrency Control, Multidatabase Recovery, Object Orientation And Interoperability Object Management Architecture CORBA and Database Interoperability Distributed Component Model COM/OLE and Database Interoperability, PUSH-Based Technologies

TEXT BOOKS :
1. Distributed Database Principles & Systems, Stefano Ceri, Giuseppe
Pelagatti McGraw-Hill

REFERENCES:
1. Principles of Distributed Database Systems, M.Tamer Ozsu, Patrick
Valduriez – Pearson Education.

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VIRTUAL REALITY
(ELECTIVE - IV)

UNIT-I
Introduction : The three I's of virtual reality, commercial VR technology and the five classic components of a VR system. (1.1, 1.3 and 1.5 of Text Book (1))

UNIT - II
Input Devices : (Trackers, Navigation, and Gesture Interfaces): Three-dimensional position trackers, navigation and manipulation, interfaces and gesture interfaces. (2.1, 2.2 and 2.3 of Text Book (1)).

UNIT - III
Output Devices: Graphics displays, sound displays & haptic feedback. (3.1,3.2 & 3.3 of Text Book (1))

UNIT - IV
Modeling : Geometric modeling, kinematics modeling, physical modeling, behaviour modeling, model management. (5.1, 5.2 and 5.3, 5.4 and 5.5 of Text Book (1)).

UNIT - V
Human Factors: Methodology and terminology, user performance studies, VR health and safety issues. (7.1, 7.2 and 7.3 of Text Book (1)).

UNIT - VI
Applications: Medical applications, military applications, robotics applications. (8.1, 8.3 and 9.2 of Text Book (1)).

UNIT - VII
VR Programming-I : Introducing Java 3D, loading and manipulating external models, using a lathe to make shapes. (Chapters 14, 16 and 17 of Text Book (2))

UNIT - VIII
VR Programming-II : 3D Sprites, animated 3D sprites, particle systems. (Chapters 18, 19 and 21 of Text Book (2))

TEXT BOOKS :
1. Virtual Reality Technology, Second Edition, Gregory C. Burdea & Philippe Coiffet, John Wiley & Sons, Inc.,
2. Killer Game Programming in Java, Andrew Davison, Oreilly-SPD, 2005.

REFERENCES :
1. Understanding Virtual Reality, interface, Application and Design, William R.Sherman, Alan Craig, Elsevier(Morgan Kaufmann).
2. 3D Modeling and surfacing, Bill Fleming, Elsevier(Morgan Kauffman).
3. 3D Game Engine Design, David H.Eberly, Elsevier.
4. Virtual Reality Systems, John Vince, Pearson Education.

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HUMAN COMPUTER INTERACTION
(ELECTIVE - IV)

UNIT - I
Introduction : Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design.

UNIT - II
The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

UNIT - III
Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

UNIT - IV
Screen Designing : Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information
retrieval on web – statistical graphics – Technological consideration in interface design.

UNIT - V
Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls.

UNIT - VI
Components – text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

UNIT - VII
Software tools – Specification methods, interface – Building Tools.

UNIT - VIII
Interaction Devices – Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

TEXT BOOKS :
1. The essential guide to user interface design, Wilbert O Galitz, Wiley DreamaTech.
2. Designing the user interface. 3rd Edition Ben Shneidermann , Pearson Education Asia.

REFERENCES :
1. Human – Computer Interaction. ALAN DIX, JANET FINCAY, GRE GORYD, ABOWD, RUSSELL BEALG, PEARSON.
2. Interaction Design PRECE, ROGERS, SHARPS. Wiley Dreamtech,
3. User Interface Design, Soren Lauesen , Pearson Education.

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DESIGN PATTERNS
(ELECTIVE-IV)

UNIT –I
Introduction : What Is a Design Pattern?, Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT-II
A Case Study : Designing a Document Editor : Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary .

UNIT-III
Creational Patterns : Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT-IV
Structural Pattern Part-I : Adapter, Bridge, Composite.

UNIT-V
Structural Pattern Part-II : Decorator, açade, Flyweight, Proxy.

UNIT-VI
Behavioral Patterns Part-I : Chain of Responsibility, Command, Interpreter, Iterator.

UNIT-VII
Behavioral Patterns Part-II : Mediator, Memento, Observer, State, Strategy, Template Method ,Visitor, Discussion of Behavioral Patterns.

UNIT-VIII
What to Expect from Design Patterns, A Brief History, The Pattern Community An Invitation, A Parting Thought.

TEXT BOOK :
1.   Design Patterns By Erich Gamma, Pearson Education

REFERENCES :
1. Pattern's in JAVA Vol-I By Mark Grand ,Wiley DreamTech.
2. Pattern's in JAVA Vol-II By Mark Grand ,Wiley DreamTech.
3. JAVA Enterprise Design Patterns Vol-III By Mark Grand ,Wiley DreamTech.
4. Head First Design Patterns By Eric Freeman-Oreilly-spd
5. Design Patterns Explained By Alan Shalloway,Pearson Education.