

Chhattisgarh Swami Vivekanand Technical University, Bilai

Scheme of Teaching and Examination

M.Tech. (Information Technology)

Semester – II

S. No.	Board of Study	Subject Code	Subject	Periods			Scheme of Examination			Total Marks	Credit L(T+P)/2
				L	T	P	Theory/Practical				
							ESE	CT	TA		
1	Information Tech.	533211 (33)	Advanced Data Base Management System	3	1	-	100	20	20	140	4
2	Computer Sc & Engg	533212 (22)	Enterprise Resource Planning	3	1	-	100	20	20	140	4
3	Information Tech.	533213 (33)	Computer Graphics & Animation	3	1	-	100	20	20	140	4
4	Information Tech.	533214 (33)	Information Security Techniques	3	1	-	100	20	20	140	4
5	Information Tech.	Elective -II		3	1	-	100	20	20	140	4
6	Information Tech.	533221 (33)	Android Lab	-	-	3	75	-	75	150	2
7	Information Tech.	533222 (33)	Computer Graphics & Animation Lab	-	-	3	75	-	75	150	2
Total				15	5	6	650	100	250	1000	24

L-Lecture, T- Tutorial, P - Practical, ESE- End Semester Examination, CT- Class Test, TA- Teacher's Assessment
 Note: Duration of all theory papers will be of Three Hours.

Elective-II			
Sr.No.	Board of Study	Subject Code	Subject Name
1	Electronics & Telecommunication	533231 (28)	Embedded System
2	Information Tech.	533232 (33)	High Performance Networks
3	Information Tech.	533233 (33)	Mobile Computing and M-Commerce

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Semester: M.Tech. II Sem.

Subject: Advanced Database Management System

Total Theory Periods: 40

Total Marks in end Semester Exam.: 100

Minimum number of class tests to be conducted: 02

Branch: IT

Code: 533211(33)

Total Tut Periods: 12

Unit-I

Relational Databases

Integrity Constraint revisited: Functional, Multivalued and Join Dependency, Template Algebraic, Inclusion and Generalized Functional Dependency, Chase Algorithms

Query Processing and Optimization: Valuation of Relational Operations, Transformation of Relational Expressions, Indexing and Query Optimization, Limitations of Relational Data Model, Null Values and Partial Information.

Unit-II

Deductive Databases

Datalog and Recursion, Evaluation of Datalog program, Recursive queries with negation.

Objected Oriented and Object Relational Databases

Modeling Complex Data Semantics, Specialization, Generalization, Aggregation and Association, Objects, Object Identity, Equality and Object Reference, Architecture of Object Oriented and Object Relational Databases

Case Studies: Gemstone, O₂, Object Store, SQL3, Oracle xxi, DB2

Unit-III

Parallel and Distributed Databases

Distributed Data Storage – Fragmentation & Replication, Location and Fragment Transparency
Distributed Query Processing and Optimization, Distributed Transaction Modeling and concurrency Control, Distributed Deadlock, Commit Protocols, Design of Parallel Databases, Parallel Query Evaluation.

Unit-IV

Advanced Transaction Processing

Nested and Multilevel Transactions, Compensating Transactions and Saga, Long Duration Transactions, Weak Levels of Consistency, Transaction Work Flows, Transaction Processing Monitors.

Unit-V

Active Database and Real Time Databases

Triggers in SQL, Event Constraint and Action : ECA Rules, Query Processing and Concurrency Control, Compensation and Databases Recovery

WEB Database

Accessing Databases through WEB, WEB Servers, XML Databases, Commercial Systems – Oracle xxi, DB2.

Data Warehousing

Data Warehousing Architecture, Multidimensional Data Model, Update Propagation OLAP Queries.

Text Books

1. Elmarsi, "Fundamentals of Database Systems", 4th Edition, Pearson Education
2. R. Ramakrishnan, "Database Management Systems", 1998, McGraw Hill International Editions

References:

1. Date, "Introduction to Database System", 7th Edition
2. S. Abiteboul, R. Hull and V. Vianu, "Foundations of Databases", 1995, Addison – Wesley Publishing Co., Reading Massachusetts
3. W. Kim, "Modern Database Systems", 1995, ACM Press, Addison – Wesley,
4. D. Maier, "The Theory of Relational Databases", 1993, Computer Science Press, Rokville, Maryland

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Semester: M.Tech. II Sem

Subject: ENTERPRISE RESOURCES PLANNING

Total Theory Periods: 40

Total Marks in End Semester Exam: 100

Minimum number of class tests to be conducted: 02.

Branch: Information Technology.

Code: 533212 (22)

Total Tutorial Periods: 12

UNIT I:

Overview of Business functions & Information system: Business function in an organization, material management, scheduling, shop floor control, forecasting, accounting & finance, human resources, productivity management.

UNIT II:

Typical Business process: Core process, product control, sales order processing, purchase, administrative process, human resource, finance support processes, marketing, strategic planning, research & development. Problem in traditional functional view. Need for integrated process view, information as a resources, motivation for ERP. Case studies.

UNIT III:

Evolution of Information System: EDP (Electronic Data Processing) system, Management Information System (MIS), Executive Information Systems, Information needs of organization, ERP as an integration of information needs at various levels, decision making involved at the above level. Supply Chain Management system, Customer Relationship Management, Case studies.

UNIT IV:

ERP models/functionality: Sales order processing, MRP-I, MRP-II, scheduling, forecasting, maintenance, distribution, finance, features of each of the model, description of data flow across each module, overview of the supporting data base, technologies required for ERP. Case Studies.

UNIT V:

Implementation of ERP & their domain: Pre implementation issues, financial justification of ERP, evaluation of commercial software during Implementation issues, reengineering of various businesses, education & training, project management, post implementation issue, performance measurement. SAP R/3 application, Oracle applications, Baan, PeopleSoft, J D Edwards. Case studies to support implementation.

Text Books :

1. V.K. GARG & N.K. VENKATKRISHNAN: ERP, Concept & Practice, PHI
2. Laudon & Laudon : Management Information System, Pearson Education

Reference Books:

- 1.V. RAJARAMAN: Analysis & Design of Information System.
2. PHIK.M.Hussain & Dussein: Information systems, Analysis, Design & Implementation, TMH.
3. Monk & Brady: Concepts in ERP, Vikas pub, Thomson
4. J. Kanter : Managing with information , PHI
5. ERP an Overview by Leon & Leon

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Semester: **M.Tech II Sem**
Subject: **COMPUTER GRAPHICS AND ANIMATION**
Total Theory Periods: **40**
Total Marks in End Semester Exam: **100**
Minimum number of class tests to be conducted: **02.**

Branch: **Information Technology**
Code: 533213 (33)
Total Tutorial Periods: **12**

Unit I : INTRODUCTION

Basics of Computer Graphics, Graphics display devices, Input devices; Raster Graphics: line and circle drawing algorithms Windowing and clipping: Cohen and Sutherland line clipping. Cyrus Beck clipping method.

Unit II : COMPUTATION AND TRANSFORMATION

Computations on polygons: point inclusion problem, polygon filling, polygon intersection, clipping. 2D and 3D Geometrical Transformations: scaling, translation, rotation, reflection.

Unit III: CURVES AND SURFACES

Viewing Transformations, parallel and perspective projection, curves and Surfaces: cubic splines, Bezier curves, B-splines, Hidden line/surface removal methods; Rendering & Visualization, Illuminations model. Shading: Gouraud, Phong. Introduction to Ray- tracing.

Unit IV: ANIMATION TECHNIQUES

Introduction, A brief history of computer animation, Technical background: Display pipeline, Homogenous coordinates and Transformation matrices, Extracting transformation from matrices, Orientation representation, Interpolation and basic techniques- Appropriate function, Controlling the motion along a curve, Path following, Key frame systems, Morphing shape and Interpolation.

Unit V: ANIMATION ALGORITHMS

Advanced algorithms- Hierarchical Kinematics Modeling, Rigid body simulation, Enforcing soft and hard constraints, Controlling group of subjects, Implicit surfaces, Modeling and animating articulated figures- Reaching and Grasping, Walking facial animation, Virtual human representation, Human figure modeling and Motion capture.

Text Books:

1. Computer Graphics by Hearn and Baker. Prentice-Hall of India, New Delhi
2. Fundamentals of Interactive Computer Graphics by Foley, VanDam, Addison-Wesley
3. Computer Animations Algorithms & Techniques by Rick Parent, Edition 2002 Academic Press.

Reference Books:

1. Multimedia System Design- Prabhat K. andleigh and Kiran Thakrar, PHI
2. Shuman, Multimedia in action, Cengage (Thomson)
3. Rogers D.F. Procedural Elements of Computer Graphics, McGraw Hill

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Semester: M.Tech II Sem

Subject: Information Security and Techniques

Total Theory Periods: 40

Total Marks in End Semester Exam: 100

Minimum number of class tests to be conducted: 02.

Branch: Information Technology.

Code: 533214 (33)

Total Tutorial Periods: 12

Unit -I:

Introduction to Information Security:

Securing Information ,Information security model, Data to information, Information systems & movement, Information management. Information security model & techniques , Information security planning , Attacks, Security planning & Policy creation, Education & Management

Overview of Cryptography :

Basic Concepts & Principles of Cryptography, Crypt analysis: Substitution Techniques, Caesar Cipher, Modified Version of Caesar Cipher, Mono-alphabetic Cipher, Homophonic & Polygram Substitution Cipher, Polyalphabetic, Playfair ,Transposition Techniques: Rail-Fence Techniques, Simple Columnar, Vernam, Book Cipher, Systematic Cipher Model, Steganography Techniques.

Unit- II :

Key Management:

Introduction to Number Theory, Elliptic Curve Arithmetic, Symmetric key Cryptography: Block cipher design, Principles and criteria, DES, IDEA, AES. Blowfish. Asymmetric key Cryptography: Principles of Public key cryptosystems, RSA algorithm, Diffie- Hellman key exchange algorithm.

Unit -III:

Watermarking & Watermark Security:

Limitations, Threats, and Impacts on the Digital Age, Concept of Watermarking , requirements ,Types & properties of watermarking & watermarking systems , Models of watermarking, Different techniques (ns) of watermarking , applications , attacks & Watermark Security .

Unit – IV: Internet security:

Secure sockets, IP security overview, IP security architecture, Internet Key Exchanging (IKE), IKE phases, encoding , internet security , threats to privacy, packet sniffing, spoofing, web security requirements , real time communication security, security standard- Kerberos, authentication services

Unit – V: Information System Security

Physical Security, Application & file protection, System Security , Network Security, Intrusion detection, Web security: Web Security consideration , Secure socket layer .Secure Electronic transaction (SET) , Smart Card Based Systems, virus and related threats , virus counter measures, firewall design principles.

Text Books:

1. Cryptography and Network Security, William Stallings, PHI.
2. Information Security Intelligence: cryptography principles & Applications, Thomas Calabrese, Thomson Delmar Learning
3. Network security essentials : application and standards, William Stallings

Reference Books:-

1. Applied Cryptography: Protocols & Algorithms, Schneier & Bruce, and MGH International.
2. Digital Watermarking & steganography , ingemar j.Cox, second Edition ,MK Morgan kaufmann Publisher (Elsevier)te, TMH
3. Cryptography & N/w Security, Atul Kaha

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Semester: M.Tech II Sem

Subject: Embedded System ELECTIVE -II

Total Theory Periods:40

Total Marks in End Semester Exam: 100

Minimum number of class tests to be conducted: 02.

Branch: Information Technology.

Code: 533231 (28)

Total Tutorial Periods: 12

UNIT I

REVIEW OF EMBEDDED HARDWARE: Terminology Gates - Timing Diagram - Memory microprocessors Buses-Direct Memory Access-interrupts - Built-ins on the Microprocessor-Conventions Used on Schematic-schematic. Interrupts, Microprocessor Architecture-Interrupt Basics-Shared Data Problem-Interrupt latency.

UNIT II

PIC MICROCONTROLLER AND INTERFACING: Introduction, CPU architecture, registers, instruction sets addressing modes Loop timing, timers, Interrupts, Interrupt timing, I/O Expansion, I 2C Bus Operation Serial EEPROM, Analog to digital converter, UART-Baud Rate-Data Handling- Initialization, Special Features - serial Programming-Parallel Slave Port.

UNIT III

EMBEDDED MICROCOMPUTER SYSTEMS: Motorola MC68H11 Family Architecture Registers, Addressing modes Programs. Interfacing methods parallel I/O interface, Parallel Port interfaces, Memory Interfacing, High Speed I/O Interfacing, Interrupts-interrupt service routine-features of interrupts-Interrupt vector and Priority, timing generation and measurements, Input capture, Output compare, Frequency Measurement, Serial I/O devices RS-232, RS-485. Analog Interfacing, Applications.

UNIT IV

SOFTWARE DEVELOPMENT AND TOOLS: Embedded system evolution trends. Round - Robin, Robin with Interrupts, function-One-Scheduling Architecture, Algorithms. Introduction to assembler, Compiler, cross-compilers and Integrated Development Environment (IDE). Object Oriented Interfacing, Recursion, Debugging strategies, Simulators.

UNIT V

REAL TIME OPERATING SYSTEMS: Task and Task States, Tasks and data, Semaphores and shared Data Operating system Services-Message queues-Timer Function-Events-Memory Management, Interrupt Routines in an RTOS environment, Basic design using RTOS.

Text Books:

1. David E Simon, " An embedded software primer ", Pearson education Asia, 2001.
2. John B Peat man " Design with Microcontroller ", Pearson education Asia, 1998.
3. Jonarthan W. Valvano Brooks/cole " Embedded Micro computer Systems. Real time Interfacing ", Thomson learning 2001.

Reference Books:

1. Burns, Alan and Wellings, Andy, " Real-Time Systems and Programming Languages ", Second Edition. Harlow: Addison-Wesley-Longman, 1997.
2. Raymond J.A. Bhur and Donald L.Bialek, " An Introduction to real time systems: Design to networking with C/C++ ", Prentice Hall Inc. New Jersey, 1999.
3. Grehan Moore, and Cyliax, " Real time Programming: A guide to 32 Bit Embedded Development. Reading " Addison-Wesley-Longman, 1998.
4. Heath, Steve, " Embedded Systems Design ", Newnes 1997.

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Semester: II

Subject: High Performance Networks Elective –I

Total Theory Periods: 40

Total Marks in End Semester Exam: 100

Minimum number of class tests to be conducted: 02.

Branch: Information Technology.

Code: 533232 (33)

Total Tutorial Periods:12

UNIT- I : Introduction to computer networks:

Review of OSI/ISO model ,Networking and Internetworking devices, Transmission Mode and Media FDM,TDM,CDMA, Statistical multiplexing , Introduction to high speed networks , High speed LANs ,Fast Ethernet , Switched Fast Ethernet , Gigabit Ethernet , ISDN: services, subscriber access to ISDN,ISDN layers and applications FDDI, Frame relay ,operations and layers.

UNIT- II : Introduction to SONET :

SONET/SDH Layers ,SONET Frame Structure , Sonet Physical Layer. Introduction ATM , Cell format and Switching Principles ,Protocol Architecture , Service categories. TCP/IP protocol Suite , IP Packet Header , TCP packet header , User services ,Protocol Operation , Connection Establishment , UDP.

UNIT- III : Congestion control in Data Networks and Internets :

Effects of Congestion , Congestion Control in Packet Switched Networks. Frame relay Congestion Control ,Traffic rate Management , Congestion Avoidance, ATM Traffic and Congestion Control , Attributes , Traffic Management Framework ,Traffic Control , ABR Traffic Management. TCP Traffic Control, Flow Control ,TCP Congestion Control , Timer Management , Window Management.

UNIT-IV: Introduction to Quality of Service

Integrated Services , Differentiated Services , Protocols for QoS support , Resource Reservation (RSVP) , Multiprotocol Label Switching (MPLS) , Real-Time Transport Protocol (RTP).

UNIT- V : Introduction to Optical networks

Wavelength division multiplexing (WDM) , Introduction to broadcast and select networks , Switch architectures , channel accessing , Wavelength routed networks , Switch architectures , Routing and wavelength assignment ,virtual topology design, IP over SONET over ATM over WDM ,IP over ATM over WDM , IP over WDM.

Text Book:

1. William Stallings, “High-Speed Networks and Internets”, 2nd Edition, Pearson Education, 2002
2. Andrew S. Tanenbaum , “ Computer Networks”
3. William Stallings ,“Data and Computer Communications”
4. B. A. Forouzan ,“Data Communication and Networking”, Tata McGrawHill , 3rd Edition

Reference Books:

1. Fred Halsall,“Multimedia Communications: Applications, Protocols, and Standards”, Pearson Education Asia, 2001
2. Rajiv Ramaswami and Kumar N. Sivarajan, “Optical Networks: A Practical Perspective”, 2nd Edition, Morgan Kaufmann (Elsevier Indian Edition), 2004
3. C. Siva Ram Murthy and Mohan Gurusamy, “WDM Optical Networks: Concepts, Design, and Algorithms”, PHI, 2002
4. Laon-Garcia and Widjaja,“Communication Networks: Fundamental Concepts and key Architectures, Tata McGrawHill, 2000.

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Semester: II

Subject: Mobile Computing & M-Commerce Elective –II

Total Theory Periods:40

Total Marks in End Semester Exam: 100

Minimum number of class tests to be conducted: 02.

Branch: Information Technology.

Code: 533233 (33)

Total Tutorial Periods: 12

Unit-I:

Mobile Computing : Architecture of Mobile Computing, Three Tier Architecture: Tier-1, Tier-2, MOM, Transaction Processing Middleware, ICAP, Tier-3. Design Consideration for Mobile Computing, Mobile Computing Through Internet. Basic cellular systems, Concept of frequency reuse channels, Hand Off mechanism, Cell splitting, Spectrum allocation.

Unit-II:

GSM & GPRS : GSM architecture, GSM entities, Call routing in GSM, Network aspects in GSM: Handover, Mobility management, Security issues in GSM, SMS & MMS Network architecture.

GPRS: QoS, Network Architecture: SGSN, GGSN, Channel coding, Signaling plane protocol architecture, Data link layer, Physical layer, GPRS Network operations: Attachment & detachment procedure, Mobility management, Routing, Data services in GPRS, Application and limitations of GPRS.

Unit-III:

Emerging Telecommunication Technologies

Bluetooth, iMode, **UMTS**: UMTS capacity planning, RAN planning, Core network planning, UMTS security, **RFID**: RFID systems, EAS systems, RFID systems work. WiMax, Java card, Adhoc networks, Sensor networks.

Security Issues in Mobile Computing: Attacks, Security techniques & algorithms, Security protocols

Unit-IV:

Mobile Adhoc networks and Routing protocols: Introduction, Architecture, Mobile ad hoc networks and the internet, Routing in self-organized networks, People-based networks, Unicast routing protocols for MANET, Broadcasting protocols for MANET, Multicasting protocols for MANET, QoS routing, and extending cellular systems with Adhoc Links, Classification of routing algorithms: Demand-Based operation , distributed operation, location information and location updates between neighboring nodes.

Unit-V:

Management of Mobile Commerce Services: Introduction to M-Commerce : Emerging applications, different players in commerce, M-Commerce life cycle, Mobile financial services, Mobile entertainment services., Implementation challenges in M-Commerce.

Text Books:

1. **Mobile Computing Technology, Applications and Service Creation** by Asoke K Taludekar, Roopa R Yavagal © 2005, Tata McGraw-Hill Publishing Company Limited. ISBN 0-07-058807-4.
2. **Handbook of wireless networks and mobile computing** by Ivan Stojmenovic, John Wiley & Sons, INC. ISBN 0-471-22456-1.
3. **Wireless Data Technologies** by Vern A. Dubendorf Copyright © 2003 John Wiley & Sons Ltd, ISBN 0-470-84949-5
4. **Mobile Commerce: Technology, Theory and Applications** by Brian Menneoke and Troy J Strader, Idea Group Publishing.

Reference Books:

1. Upen Dala: Wireless Communication, Oxford Press.
2. Rajkamal: Mobile Computing, Oxford University Press.
3. Mobile Commerce: Opportunities and challenges, A GS1 Mobile Com White Paper.
4. Mobile Adhoc Networking: Stefano Basagni, Marco Conti, Silvia Giordano, Ivan Stojmenovic, IEEE PRESS, A JOHN WILEY & SONS, INC., PUBLICATION

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Semester: II
Subject: Android Lab
Total Lab Periods: 40

Branch: Information Technology.
Code: 533221 (33)
Total Marks in End Semester Exam: 75

List of Experiments

- Create “Hello World” application which will display “Hello World” in the middle of the screen in the red colour with white background.
- Create an application with login module (Check username and password). On successful login, go to next screen. On failure, alert user using Toast. Also pass username to next screen.
- Create login application to validate Email ID. Login button should remain disabled till the username and password is not validated.
- Create an application that will change colour of the screen, of the screen, based on the selected option from the menu.
- Create an application that will display toast (Message) on specific interval of time.
- Create an UI such that, screen will have list of all types of cars, on selecting any car name, next screen should show car details like : name, launched date, company name, images (using gallery) if available, show different colors in which it is available.
- Create an application to read phonebook contacts using content providers and display in list.
- Create an application to read messages from the mobile and display it on the screen.
- Create an application to call specific entered number by user in the Edit Text.
- Create an application that will create database with table of User credential.
- Create an application to insert, Update, Delete, and Retrieve operations on the database.
- Create an application to draw 2D figures (line, circle, square) on the screen.
- Create an application to send text message to a specific mobile number.
- Create a Frame-by-Frame application for displaying multiple images in a specific interval of time to show a video effect.

List of Tools and Application Software’s required:

- JDK (Java Development Kit)
- Eclipse
- SDK (Software Development Kit)
- ADT (Android Development Kit)

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Semester: M. Tech II Sem

Subject: Computer Graphics and Animation LAB

Total Lab Periods: 40

Branch: Information Technology.

Code: 533222 (33)

Total Marks in End Semester Exam: 75

List of experiments:

1. To write a program to draw a line using Bresenham line drawing algorithm.
2. To write a program to draw a circle using the mid point circle algorithm.
3. To write a program to fill a circle with any color using “boundary-fill” algorithm.
4. To write a program to fill a square with multiple colour edges using any colour using “flood-fill” algorithm.
5. To write a program to implement polygon clipping.
6. To write a program to perform line clipping using Cohen Sutherland algorithm.
7. To write a program to perform rotation of line, rectangle and triangle.
8. To write a program to draw a “pie-chart”.
9. To write a program to make “moving ball” .
10. Create rainfall animation against a matching background.
11. To create animation of a flag with cloth.
12. To create a model of a Rubic-cube.
13. To create a model of computer and components.
14. To make a model of chrome material.
15. To create windows-like logo.

List of tools and software required:

C,C++, Animation tools.

Recommended Books:

Programming in Computer graphics – Hearn & Baker