

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Scheme of teaching and examination

B.E. VII Semester Information Technology

S.No	Board of Study	Subject Code	Subject ; Name	Periods per week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	Theory/Practical				
							ESE	CT	TA		
1	Computer Sc. & Engg	333731(22)	Data Mining & Warehousing	3	1		80	20	20	120	4
2	Information Technology	333732(33)	Management Information System & IT	3	1		80	20	20	120	4
3	Computer Sc. & Engg	333733(22)	Artificial Intelligence & Expert Systems	3	1		80	20	20	120	4
4	Computer Sc. & Engg	322734(22)	Cryptography & Network Security	3	1		80	20	20	120	4
5	Refer Table-2		Professional Elective-2	4			80	20	20	120	4
6	Computer Sc. & Engg	333761(22)	Network Security Lab			4	40		20	60	2
7	Computer Sc. & Engg	333762(22)	Artificial Intelligence & Expert Systems Lab			4	40		20	60	2
8	Info. Technology	333763(33)	Andriod Lab			4	40		20	60	2
9	Info. Technology	333764(33)	Minor Project			5	100		40	140	3
10	Management	333765(76)	Innovative & Entrepreneurial Skills			2			40	40	1
11	Info. Technology	333766(33)	** Practical Training ** Evaluation / Library			1			40	40	1
			TOTAL	16	4	20	620	100	280	1000	31

L:Lecture

T:Tutorial

P:Practical

ESE: End Semester Examination

CT: Class Test

TA: Teacher's Assessment

Note 1: Duration of All theory papers will be of Three Hours

Note 2: ** To be completed after VI semester and before the commencement of VII Semester

Table-2: Professional Elective II

S. No.	Board of Study	Subject Code	Subject
1	Computer Science & Engg.	322740(22)	Digital Image Processing
2	Computer Science & Engg.	322741(22)	Advanced Computer Architecture
3	Computer Science & Engg.	322742(22)	Operation Research
4	Computer Science & Engg.	322743(22)	E-Commerce & Strategic IT
5	Computer Science & Engg..	322744(22)	Natural Languages Processing
6	Computer Science & Engg.	322745(22)	OODBMS
7	Computer Science & Engg.	322746(22)	Cloud Computing
8	Computer Science & Engg.	322747(22)	Grid Computing
9	Information Technology	333748(33)	Multimedia and Communication
10	Computer Science & Engg.	333749(22)	Wireless Networks
11	Computer Science & Engg.	333750(22)	Advanced Database Management System

Note (1)- 1/4th of total strength of students subject to Minimum strength of twenty students is required to offer an elective in the college in a particular academic session.

Note (2)- Choice of elective course once made for an examination cannot be changed for future examination.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Data mining and warehousing

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 333731(22)

Total Tutorial Periods: 12

Minimum number of CT to be conducted: 02

Course objective:

- To understand the overall architecture of a data warehouse.
- The different data mining models and techniques will be discussed in this course.
- Evaluate different models used for OLAP and data pre-processing;
- Design and implement systems for data mining and evaluate the performance of different data mining algorithms;
- Propose data mining solutions for different applications.
- Differentiate Online Transaction Processing and Online Analytical processing

Unit-I: Overview and Concepts: Need for data warehousing, basic elements of data warehousing, Trends in data warehousing. Planning and Requirements: Project planning and management, Collecting the requirements. Architecture And Infrastructure: Architectural components, Infrastructure and metadata.

Unit-II: Data Design And Data Representation: Principles of dimensional modeling, Dimensional modeling advanced topics, data extraction, transformation and loading, data quality.

Unit-III: Information Access and Delivery: Matching information to classes of users, OLAP in data warehouse, Data warehousing and the web. Implementation And Maintenance: Physical design process, data warehouse deployment, growth and maintenance.

Unit-IV: Data Mining: Introduction: Basics of data mining, related concepts, Data mining techniques Data Mining Algorithms: Classification, Clustering, Association rules. Knowledge Discovery: KDD Process.

Unit-V: Web Mining: Web Content Mining, Web Structure Mining, Web Usage mining. Advanced Topics: Spatial mining, Temporal mining. Visualization : Data generalization and summarization-based characterization, Analytical characterization: analysis of attribute relevance, Mining class comparisons: Discriminating between different classes, Mining descriptive statistical measures in large databases Data Mining Primitives, Languages, and System Architectures: Data mining Primitives, Query language, Designing GUI based on a data mining query language, Architectures of data mining systems Application and Trends in Data Mining: Applications, Systems products and research prototypes, Additional themes in data mining, Trends in data mining

Course outcome: After successful completion of this course students will be

- Design a data warehouse for an organization
- Develop skills to write queries using DMQL
- Extract knowledge using data mining techniques
- Adapt to new data mining tools.
- Explore recent trends in data mining such as web mining, spatial-temporal mining.

Text Books:

1. Data warehousing- concepts, Techniques, Products and Applications by Prabhu, Prentice hall of India
2. Insight into Data Mining: Theory & Practice by Soman K P, Prentice hall of India.
3. Data Mining Introductory and Advanced Topics by M.H. Dunham, Pearson Education.

Name of Reference Books:

1. Data Warehousing Fundamentals by Paulraj Ponniah, John Wiley.
2. Introduction to Data mining with Case Studies by Gupta, PHI.
3. The Data Warehouse Lifecycle toolkit by Ralph Kimball, John Wiley.
4. Introduction to Building the Data warehouse, IBM, PHI.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Branch: Information Technology

Subject: Management Information System and IT

Code: 333732(33)

Total Theory Periods: 40

Total Tutorial Periods: 12

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

Course Objectives:

- Understand the role of information systems for business and management;
- Understand the role of information technology for competitive advantage;
- Understand the role of the major types of information systems in a business environment and their relationship to each other;
- Understand the system lifecycle methodology and gain the knowledge about ethics for the computer users and laws;
- Identify the major management challenges to building and using information systems and learn how to find appropriate solutions to those challenges.

UNIT – I : Management Information System and System Concepts:

Management Information System: What is MIS ? Concept of Organizational Information Subsystems, Report Writing Software, Mathematical Modeling, Simulation, Graphical Output, MIS and Human Factors Considerations, MIS and Problem Solving. **Systems Concepts:** Models, General Systems Model, Environment, Systems Approach.

UNIT -II: CBIS, Information System for competitive advantage & computer use in an international market:

Computer-Based Information System: Information Management, Who are the Information Users ? The Manager and Systems, Data Versus Information, Evolution of CBIS, Model Of CBIS, Trend to End User Computing, Justifying the CBIS, Achieving the CBIS, Re-engineering the CBIS, Managing the CBIS. **Information Technology For Competitive Advantage :** Firm in its environment, Competitive Advantage, What are the information resources ? Who manages the information Resources ? Strategic Planning for the Enterprise, Strategic Planning for Information Resources. End-User Computing as a Strategic Issue, Information Resource Management Concept. **Computer Use in an International Market Place :** Multinational Corporation, Special Need for Coordination in an MNC, Global Business Strategies, Global Business Drivers, Problems in Implementing GIS, GIS implementation Strategies, Computing Around the World.

UNIT-III: Organization Information Systems: Accounting Information System, Decision Support Systems, Executive Information System, Marketing Information Systems, Financial Information System, Human Resource Information System

UNIT-IV: System lifecycle methodologies, information resources, Computer Crime, Ethics & Social Issues.

System Lifecycle Methodologies: The System Life Cycle, The Planning Phase, The Analysis Phase, The Design Phase, The Implementation Phase, The Use Phase, Prototyping, Rapid Application Development, Business Process Redesign. **Information Resources Information Systems :** The Information Services organization, A Model of an Information Resources Information System, CIO Responsibilities, Achieving Quality Management in Information Services, Systems Security, Contingency Planning, Information Management Cost Reduction Strategies. **Computer Crime, Ethics, and Social Issues :** Morals, Ethics and the Law, Need for an Ethics Culture, Ethics for Computer Users, Ethics for Computer Professionals, Ethics for Business, Ethics and Information Services, Social Rights and the Computer, Codes of Ethics, Ethics and Information Specialists, Ethics and the CIO, Controlling Prewritten Software, Plagiarism, Ten Commandments of Computing, A Personal Ethics Guidelines.

UNIT-V: Case Studies: Study, Analysis, and Design of the following Management Information Systems...

1. Payroll Management System
2. Inventory Control Management System e.g. Medical Shop
3. Library Management System
4. University Result Management System

Finalizing Inputs, Processes, and Outputs. Organization of inputs, design of output formats. Finalizing Data Entry modules(AA-Add After, IN-Inquire, DL-Delete, UP-Update, LI-List, PR-Print, EX-Exit), Menus, Sub Menus, etc. Finalizing the Processing modules, their workings, Menus, Sub Menus, etc. Use of techniques viz. IPO charts, HIPO charts, Decision tables, Flow Charts, etc. is expected.

(Note : The teachers and students should perform the Study, Analysis, and Design. They should study the relevant written and non written rules and regulations e.g. Service rules, Manuals, Ordinances, etc. They should download the relevant material from the Internet)

Course Outcomes: At the completion of the course student will be able to -

- Describe the basic concepts and technologies used in the field of management information systems;
- Identify the different types of management information systems;
- Explain the ethical, social, and security issues of information systems;
- Describe the role of information systems in organizations, the strategic management processes, and the implications for the management;
- Describe about the importance of managing organizational change associated with information systems implementation;
- Describe the practical approach of developing and implementing information systems.

Text Books:

1. Management Information Systems, International Edition, Raymond McLeod, Jr. and George Schell (Prentice Hall)
2. Management Information Systems, Suresh K. Basandra (A. H. Wheelers, Publishing Company Limited)

Reference Books:

1. Introduction to Computer Information System for Business, Mark G. Simkin. S. Chand Co., 1996.
2. Analysis & Design of Information Systems, James A. Senn. MC Graw-Hill International edition, 1989.
3. Analysis and Design of Information System , V. Rajaraman(PHI)

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C. G.)**

Semester: **VII**

Subject: **Cryptography and Network Security**

Total Theory Periods: **40**

Total Marks in End Semester Exam: **80**

Minimum number of class tests to be conducted: **02**

Branch: **Information Technology**

Code: **322734(22)**

Total Tutorial Periods: **12**

Assignments: **1 per Unit**

Course Objective:

- To understand the principles and practices of cryptography and network security
- To understand the practical applications that have been implemented and are in use to provide network security

UNIT I: Overview: Security trends, The OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms, A Model for Network Security. **Symmetric (Private Key) Ciphers: Classical Encryption Techniques:** Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Rotor Machines, Steganography. **Block Ciphers and the Data Encryption Standard:** Block Cipher Principles, The Data Encryption Standard (DES), The Strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design Principles.

UNIT II: Symmetric Ciphers (continued): Basic Concepts in Number Theory and Finite Fields: Groups, Rings, and Fields, Modular Arithmetic, the Euclidian algorithm, Finite Fields of the Form $GF(p)$, Polynomial Arithmetic, Finite Fields of the Form $GF(2^n)$. **Advanced Encryption Standard:** The Origins AES, Evaluation criteria for AES, the AES Cipher. **Stream cipher:** Stream ciphers and RC4. **Confidentiality using symmetric encryption:** Placement of encryption function, traffic confidentiality, key distribution.

UNIT III: Asymmetric (Public Key) Ciphers: Introduction to Number Theory: Prime Numbers, Fermat's and Euler's Theorems, Testing for Primality, The Chinese Remainder Theorem, Discrete Logarithms. **Public-Key Cryptography and RSA:** Principles of Public-Key Cryptosystems. **Key Management-Other Public-Key Cryptosystems:** Key management, Diffie-Hellman Key Exchange, Elliptic Curve Arithmetic, Elliptic Curve Cryptography.

UNIT IV: Asymmetric Ciphers (continued): Message Authentication and Hash functions: Message authentication requirements, authentication functions, Message authentication codes, Hash functions, Security of Hash functions and MAC, SHA, HMAC, CMAC. **Digital Signatures and Authentication protocols:** Digital signature, Authentication protocols, Digital signature standards,

UNIT V: Network Security applications: Authentication applications: Kerberos, X.509 Authentication services, Public key infrastructure. **Electronic mail security:** PGP, S/MIME. Overview of IP Security. **Web Security:** Web security considerations, SSL and TLS, Secure electronic transaction. **System Security:** Intruders, Intrusion detection, password management, viruses and related threats, virus counter measures, Firewall design principles, and trusted systems.

Course Outcome: after successful completion of this course, the students will be able to explain

- Conventional encryption algorithms for confidentiality and their design principles
- Public key encryption algorithms and their design principles
- Use of message authentication codes, hash functions, digital signature and public key certificates
- Network security tools and applications
- System-level security issues like threat of and countermeasures for intruders and viruses, and the use of firewalls and trusted systems.

Text Book:

1. William Stallings, "Cryptography and Network Security, Principles and Practices", Pearson Education, Prentice Hall, 4th Edition.
2. Cryptography and Network Security, Atul Kahate, McGraw Hill Education (India) Private Limited; Third edition.

Reference books:

1. Applied Cryptography: Protocols & Algorithms, Schneier & Bruce, MGH International.
Cryptography and Security – by Dr T R Padmanabhan N Harini, Wiley India Pvt Ltd, 2011.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Branch: Information Technology.

Subject: Artificial Intelligence & Expert Systems

Code: 333733(22)

Total Theory Periods: 40

Total Tutorial Periods: 12

Total Marks in End Semester Exam: 80

Minimum number of CT to be conducted: 02

Course objective:

- Introduce the basic principles of AI towards problem solving, inference, perception, knowledge representation and learning.
- Investigate applications of AI techniques in intelligent agents, expert systems, artificial neural Networks and other machine learning models.
- Experiment with a machine learning model for simulation and analysis.
- Explore the current scope, potential, limitations, and implications of intelligent systems.
- To have a basic proficiency in a traditional AI language including an ability to write simple to intermediate programs and an ability to understand code written in that language.

UNIT I Overview & Search Techniques:

Introduction to AI, Problem Solving, State space search, Blind search: Depth first search, Breadth first search, Informed search: Heuristic function, Hill climbing search, Best first search, A* & AO* Search, Constraint satisfaction. Game tree, Evaluation function, Mini-Max search, Alpha-beta pruning, Games of chance.

UNIT II Knowledge Representation (KR):

Introduction to KR, Knowledge agent, Predicate logic, WFF, Inference rule & theorem proving forward chaining, backward chaining, resolution; Propositional knowledge, Boolean circuit agents.

Rule Based Systems, Forward reasoning: Conflict resolution, backward reasoning: Use of Back tracking, Structured KR: Semantic Net - slots, inheritance, Frames- exceptions and defaults attached predicates, Conceptual Dependency formalism and other knowledge representations.

UNIT III Handling uncertainty & Learning:

Source of uncertainty, Probabilistic inference, Bayes' theorem, Limitation of naïve Bayesian system, Bayesian Belief Network (BBN), Inference with BBN, Dempster-Shafer Theory, Fuzzy Logic, Fuzzy function, Fuzzy measure, Non monotonic reasoning: Dependency directed backtracking, Truth maintenance systems. Learning: Concept of learning, Learning model, learning decision tree, Paradigms of machine learning, Supervised & Unsupervised learning, Example of learning, Learning by induction, Learning using Neural Networks.

UNIT IV Natural Language Processing (NLP) & Planning:

Overview of NLP tasks, Parsing, Machine translation, Components of Planning System, Planning agent, State-Goal & Action Representation, Forward planning, backward chaining, Planning example: partial-order planner, Block world.

UNIT V Expert System & AI languages:

Need & Justification for expert systems- cognitive problems, Expert System Architectures, Rule based systems, Non production system, knowledge acquisition, Case studies of expert system. Ai language: Prolog syntax, Programming with prolog, backtracking in prolog, Lisp syntax, Lisp programming.

Course outcome: After successful completion of the course, students will be able

- Demonstrate fundamental understanding of artificial intelligence (AI) and expert systems.
- Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
- Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
- Demonstrate proficiency in applying scientific method to models of machine learning.

Text Books:-

1. Artificial Intelligence by Elaine Rich and Kevin Knight, Tata McGraw Hill.
2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson, Prentice Hall of India.

Reference Books :-

1. Principles of Artificial Intelligence by Nils J.Nilsson, Narosa Publishing house.
2. Programming in PROLOG by Clocksin & C.S. Melish, Narosa Publishing house.
3. Rule based Expert Systems-A practical Introduction by M. Sasikumar, S.Ramani, et. al., Narosa Publishing House.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C. G.)**

Semester: **VII**
Subject: **Network Security Lab**
Total Practical Periods: **42**
Total Marks in End Semester Exam: **40**

Branch: **Information Technology.**
Code: 333761(22)
Duration of period: 50 minutes
Number of Periods per Week: 3

Course Objectives:

- To understand the fundamentals of Cryptography through practical implementation.
- To implement standard algorithms used to provide confidentiality, integrity and authenticity.
- To understand the various key distribution and management schemes.
- To understand how to use cutting edge simulation tools
- To design security applications in the field of Information technology.

The following exercises are based on the cryptographic algorithms. They can be implemented using C, C++, Java, etc. However the students are advised to use Java cryptographic packages to implement the programs in UNIX environment. Minimum 12 experiments should be performed.

1. Write a C program that contains a *string*(char pointer) with a value 'Hello world'. The program should XOR each character in this string with 0 and displays the result.
2. Write a C program that contains a *string*(char pointer) with a value 'Hello world'. The program should
 - a. AND and
 - b. XOREach character in this string with 127 and display the result.
3. Write a Java program to perform encryption and decryption using the following algorithms
 - a. Ceaser cipher
 - b. Substitution cipher
 - c. Hill Cipher
4. Write a C/Java program to implement the 8 bits simplified DES algorithm logic
5. Write a C/Java program to implement the Blowfish algorithm logic.
6. Write the RC4 logic in Java
7. Implement the Euclid Algorithm to generate the GCD of an array of 10 integers in 'C'.
8. Implement Rabin-Miller Primality Testing Algorithm.
9. Write a Java program to implement RSA algorithm.
10. Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript.
11. Write a Java program to calculate the message digest of a text using the SHA-1 algorithm.
12. Calculate the message digest of a text using the MD5 algorithm in JAVA.
13. Create a digital certificate of your own by using the Java keytool.
14. Write Java program to hide of confidential information within Image using Steganography technique
15. Configure a firewall to block the following for 5 minutes and verify the correctness of this system using the configured parameters:
 - a. Two neighborhood IP addresses on your LAN
 - b. All ICMP requests
 - c. All TCP SYN Packets

Course outcome: Students will be able to

- Develop programs to implement various encryption and decryption techniques.
- Develop programs to implement symmetric and asymmetric key crypto system.
- Develop programs to implement message authentication codes, digital signature.
- Use the cryptographic packages available in JDK.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C. G.)**

Semester: **VII**

Subject: **Artificial Intelligence & Experts Systems Lab**

Total Practical Periods: **42**

Total Marks in End Semester Exam: **40**

Course Objectives:

Branch: **Information Technology.**

Code: 333762(22)

Duration of period: 50 minutes

Number of Periods per Week: 3

Suggested List of Experiments (but should not be limited to):

1. Write a prolog program to find the rules for parent, child, male, female, son, daughter, brother, sister, uncle, aunt, ancestor given the facts about father and wife only.
2. Write a program to find the length of a given list
3. Write a program to find the last element of a given list
4. Write a program to delete the first occurrence and also all occurrences of a particular element in a given list.
5. Write a program to find union and intersection of two given sets represented as lists.
6. Write a program to read a list at a time and write a list at a time using the well defined read & write functions.
7. Write a program given the knowledge base,
If x is on the top of y, y supports x.
If x is above y and they are touching each other, x is on top of y.
A cup is above a book. The cup is touching that book. Convert the following into wff's, clausal form; Is it possible to deduce that 'The book supports the cup'.
8. Write a program given the knowledge base,
If Town x is connected to Town y by highway z and bikes are allowed on z, you can get to y from x by bike.
If Town x is connected to y by z then y is also connected to x by z.
If you can get to town q from p and also to town r from town q, you can get to town r from town p.
Town A is connected to Town B by Road 1. Town B is connected to Town C by Road 2.
Town A is connected to Town C by Road 3. Town D is connected to Town E by Road 4.
Town D is connected to Town B by Road 5. Bikes are allowed on roads 3, 4, 5.
Bikes are only either allowed on Road 1 or on Road 2 every day. Convert the following into wff's, clausal form and deduce that 'One can get to town B from town D'.
9. Solve the classical Water Jug problem of AI.
10. Solve the classical Monkey Banana problem of AI.
11. Solve the classical Crypt arithmetic problems such as DONALD + GERALD = ROBERT of AI.
12. Solve the classical Missionary Cannibals problem of AI.
13. Solve the classical Travelling Salesman Problem of AI.
14. Solve the classical Blocks World Problem of AI.
15. Write a program to search any goal given an input graph using AO* algorithm.

List of Equipments/Machine required :

- (i) PC with Windows xp
- (ii) Visual prolog compiler

Recommended Books :

1. Ivan Bratko : Logic & prolog programming.
2. Carl Townsend : Introduction to Turbo Prolog, BPB, Publication.
3. W.F. Clocksin & Mellish : Programming in PRLOG, Narosa Publication House.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C. G.)**

Semester: VII
Subject: **Android Lab**
Total practical Periods: 42

Branch: **Information Technology.**
Code: **333763(33)**
Total Marks in End Semester Exam: **40**

Course objective:

- Understanding the working of Android applications
- To learn how to create GUI and handle events in Android applications.
- Understanding development of applications with data storage, APIs and Databases

Suggested List of Experiments (but should not be limited to)

1. Download and setup Android Environment
2. Using the Development environment
 - a. Create a new Project using wizard
 - b. Add source and resource files.
 - c. Import existing projects into workspace
 - d. Create testing Emulator
 - e. Compile and run the project
 - f. Debug the project
 - g. Debug on android device.
3. XML Files
 - a. AndroidManifest.xml
 - a.i. Edit the manifest and change min sdk and target sdk of application.
 - a.ii. Add main activity entries in manifest.
 - a.iii. Add second activity entries in manifest.
 - a.iv. Add Entries for Service, Broadcast receivers.
 - a.v. Add uses permissions for reading files, internet, camera.
 - b. Layouts
 - b.i. Create Linear Layout in xml
 - b.ii. Create Relative Layout in xml
 - b.iii. Create frame layout in xml
 - b.iv. Create a complex mixed layout using all above layouts
 - c. Drawables
 - c.i. Create xml drawable for rectangular, oval and other basic shapes
 - c.ii. Create xml drawable with Layer list for complex shapes.
 - d. Values
 - d.i. Create strings.xml to store all your application strings.
 - d.ii. Create color.xml to store all your color values
 - d.iii. Create styles.xml to store all your custom themes and style objects
 - e. Alternate resources based on qualifiers
 - e.i. Create separate drawables folders and xml files based on screen density (LDPI, MDPI, HDPI, XHDPI, XXHDPI)
 - e.ii. Create separate styles.xml based on different android versions.
 - e.iii. Create separate layout folders based on device screen sizes and orientations.
4. Creating User Interface
 - a. Create application with Basic Views (Textview, Button, ListView)
 - b. Create application with different Layouts (Linear, Relative, Frame)
 - c. Create application to handle and respond on click using Click Listeners
5. Assets and Images
 - a. Create application which will access files from Assets folder (Images, sounds, Custom Fonts)

6. Application Fundamentals
 - a. Activities
 - a.i. Create application with one activity and display a layout created in xml.
 - a.ii. Create application which will log all activity lifecycle events using Android log api.
 - a.iii. Create application which should be Saving and restoring app state (eg textview text, checkbox checked state)
 - b. Intents
 - b.i. Create application which will start another activity using intent.
 - b.ii. Create an activity which will pass data to second activity using intent.
 - b.iii. Create activity which will start second activity and get response back from second activity.
 - c. Services
 - c.i. Create
7. Content Providers
 - a. System provided content providers
 - a.i. Create application which can access/modify Contacts of device.
 - a.ii. Create application which can access & display Images available on device.
 - a.iii. Create application which can access and play Media files (Audio & Video)
 - b. Custom Contact providers
 - b.i. Create application which will provide some data to other applications using ContentProvider system.
8. Broadcast Receivers
 - a. Create application to Listen to following system events using Receivers
 - a.i. Incoming SMS
 - a.ii. In and outgoing Phone Call
 - a.iii. Low Battery
 - a.iv. Storage state changed
 - b. Create application which will broadcast Custom event to custom Receivers.
9. Create application which will display following Notifications
 - a.i. Toast notification
 - a.ii. Status bar notification
 - a.iii. Dialog notification
10. Preference & Data Storage
 - a. Create application which will save and read back data using Shared Preference
 - b. SQLite database
 - b.i. Create app to create database using Open helper
 - b.ii. Create app to read, write and delete database entries
11. Networking & Web API
 - a. HTTP connectivity
 - a.i. Create app to connect and fetch data from a Http server/ website using URLConnection
 - a.ii. Create app to connect and fetch data from a Http server/ website using HTTPClient library
 - a.iii. Create app to connect and post data to Http server/ website using URLConnection
 - a.iv. Create app to connect and post data to Http server/ website using HTTPClient library
 - b. TCP Sockets or Sockets
 - b.i. Create a server app using tcp socket, it will send "Welcome" to client when its connected.
 - b.ii. Create a client app using tcp socket, it will send "Hello" to server once connected.
12. Google API
 - a. Create application using Maps api, it should display marker on current location of user
 - b. Create application which will display ads using Admob api
13. Accessing android hardware
 - a. Create Application to take picture and save it to file storage using camera api
 - b. Create application to display current direction using sensor api
 - c. Create application to show a toast if phone is waved in air.
 - d. Create application to show list of paired and nearby bluetooth devices.
14. Facebook SDK

- a. Create application which can share link on facebook using Facebook sdk.
 - b. Create application which can share photo on facebook using Facebook sdk.
15. Publish to playstore
- a. Enable Obfuscation for your application using Proguard
 - b. Export Signed application package
 - c. Prepare Store listing
 - d. Upload and publish apk

COURSE OUTCOMES: Once the student has successfully completed this course, he/she will be able to answer the following questions or perform following activities:

- Understands basic concepts and technique of developing applications for the Android phone.
- Able to use the SDK and other development tools.
- Acquaintances with how to publish Android applications to the Android Market.

Reference Books:

Head First Android- By Jonathan Simon

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Digital Image Processing

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology

Code: 322740(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objective

- Cover the basic theory and algorithms that are widely used in digital image processing
- Expose students to current technologies and issues that are specific to image processing systems
- Develop hands-on experience in using computers to process images
- Develop critical thinking about shortcomings of the state of the art in image processing

UNIT I: Introduction:

Image formation model, Spatial & Gray level resolution, Image enhancement in special domain: Piecewise transformation functions, Histogram equalization, Histogram specification, image averaging, spatial filters- smoothing and sharpening, Laplacian filter, Canny edge detector.

UNIT II: Image Enhancement in Frequency Domain & Image segmentation :

2D discrete Fourier transform & its inverse, filtering in frequency domain, Ideal & Gaussian low pass filters, High pass filtering, FFT, Line detection, Edge detection, Edge linking & boundary detection, Thresholding, Region based segmentation.

UNIT III: Morphological Image Processing:

Logic operations involving binary image, Dialation & Erosion, Opening & Closing, Applications to Boundary extraction, region filling, connected component extraction.

UNIT IV: Image compression:

Coding redundancy- Huffman coding, LZW coding, run length coding, Lossy compression- DCT, JPEG, MPEG, video compression.

UNIT V: Image representation & 3D:

Boundary descriptors, Shape numbers, Texture, Projective geometry, Correlation based and feature based stereo correspondence, shape from motion, optical flow.

Outcomes: After successful completion of the course, student will be able to

- Describe, analyze and reason about how digital images are represented, manipulated, encoded and processed, with emphasis on algorithm design, implementation and performance evaluation.
- Apply principles and techniques of digital image processing in applications related to digital imaging system design and analysis.
- Analyze and implement image processing algorithms.

Name of Text Books:-

1. Ganzalez and Woods, Digital Image Processing, Pearson education.
2. Sonka and Brooks, Image Processing, TSP Ltd,

Name of Reference Books:-

1. Jain and Rangachar, Machine Vision, MGH.
2. Schalkoff, Digital Image Processing, John Wiley and sons.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Advanced Computer Architecture

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 322741(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objective

- To provide in-depth coverage of current and emerging trends in computer architectures, focusing on performance and the hardware/software interface.
- To analyzing fundamental issues in architecture design and their impact on application performance.

UNIT I: Pipeline:

Linear: pipeline processor, Non linear pipeline processor, Instruction pipeline design, Mechanisms, Dynamic instruction scheduling, Arithmetic pipeline design, Super-scalar processors, VLIW architecture.

UNIT II: Memory Hierarchy and I/O Organization ON:

Cache memories, Cache coherence, High bandwidth memories, High bandwidth I/O, Disk I/O, Bus specifications and standards.

UNIT III: Parallel Computer Models & Program Parallelism:

Classification of Machines, SISD, SIMD & MIMD, Condition of parallelism, data and resource dependencies, Program partitioning & scheduling, grain size latency, control flow versus data control, data flow architecture.

UNIT IV: synchronous Parallel processing :

Vector instruction types, vector access memory schemes, vector and symbolic processors, SIMD architecture, SIMD parallel algorithms, SIMD computers and performance enhancements.

UNIT V: System Interconnection:

Network properties and routing, static interconnection networks, dynamic interconnection networks, Multiprocessor system interconnection, Multistage & combining networks.

Course Outcomes: After successful completion of this course, students will be

- Discuss the organization of computer-based systems and how a range of design choices are influenced by applications
- Differentiate different processor architectures and system-level design processes.
- Understand the components and operation of a memory hierarchy and the range of performance issues influencing its design.
- Understand the organization and operation of current generation parallel computer systems, including multiprocessor and multi core systems.
- Understand the principles of I/O in computer systems, including viable mechanisms for I/O and secondary storage organization.

Text Books:-

1. Flynn Computer Architecture: Pipelined and parallel processor design, JB, Boston.
2. Computer Architecture & Parallel processing - Kai Hwang 7 Briggs. (MGH).

Reference Books:-

1. Parallel Computer 2 –Arch.& Algo, R.W. Hockney, C.R. Jesshope, Adam Hilger.
2. Advanced Computer Architecture with Parallel Programming, K. Hwang, MGH.
3. Parallel Computing, Theory and Practice, Michel J. Quinn, MGH.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Multimedia & Communications

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 333748(33)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objectives:

- To discuss the technical details of common multimedia data formats, protocols, and compression techniques of digital images, video and audio content.
- To describe and understand the technical details of JPEG and MPEG families of standards.
- To discuss the significance of “Quality of Service” in multimedia networking.
- To describe the principles and technical details of several wired and wireless networking protocols.
- Develop simple but demonstrative multimedia applications using JAI and JMF.

UNIT-I: Introduction: Concept of Non-Temporal and Temporal Media. Basic Characteristics of Non-Temporal Media; Images, Graphics, Text. Basic Characteristics of Temporal Media: Video, Audio, Animation. Hypertext and Hypermedia. Presentations: Synchronization, Events, Scripts and Interactivity, Introduction to Authoring Systems.

UNIT-II: Compression Techniques:

Basic concepts of compression, still image Compression. JPEG Compression. Features of JPEG2000. Video Compression: MPEG- 1&2 Compression Schemes, MPEG-4 Natural Video Compression. Audio Compression: Introduction to speech and Audio Compression, MP3 Compression Scheme. Compression of synthetic Graphical objects.

UNIT-III: Multimedia System Architecture:

General Purpose Architecture for Multimedia Support: Introduction to Multimedia PC/Workstation Architecture, Characteristics of MMX instruction set, I/O systems: Overview of USB port and IEEE 1394 Interface, Operating System Support for Multimedia Data: Resource scheduling with real-time Considerations, File System, I/O Device Management.

UNIT-IV: Multimedia Information Management:

Multimedia Database Design, Content Based Information Retrieval: Image Retrieval, Video Retrieval, Overview of MPEG-7, Design of video- on-Demand Systems

UNIT-V: Virtual Reality:

Introduction to Virtual Reality and Virtual Reality Systems, Related Technologies: Tele-operation and Augmented Reality Systems Interface to the Virtual World-Input; Head and hand trackers, data globes, haptic input devices. Interface to the Virtual World- Output, Stereo display, head-mounted display, auto stereoscopic displays, holographic displays, haptic and force feedback. VRML Programming; Modeling objects and virtual environments Domain Dependent applications: Medical, Visualization, Entertainment etc.

Course Outcome: After successfully completing this course, students will be able to develop a thorough understanding of the major aspects of technical details of multimedia data representation, and multimedia content delivery platforms. The techniques and understandings will support proper evaluation, development, and enhancement of distributed multimedia applications.

Text Book:-

1. Multimedia Technology, TAY Vaughan, McGraw-Hill
2. Multimedia Concept & Practice, Hartman & Carey, PHI
3. Virtual Reality Systems, John Vince, Addison Wesley.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Wireless Networks

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 333749(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objective:

- Understand the architecture and applications of current and next generation wireless networks: Cellular, WLANs, sensor networks, mobile ad-hoc networks and intermittently connected mobile networks.
- Learn how to design and analyze various medium access and resource allocation techniques wireless networks.
- Learn to design and analyze transport layer protocols, with an emphasis on congestion control, including TCP over wireless, congestion sharing mechanisms, explicit and precise rate control, utility optimization-based approaches, and backpressure-based utility optimization.

UNIT-1

Wireless Communication Standard-First, Second and Third Generation Wireless Communication Network, Coverage Extension, Types; Characterization of Wireless Channels- multipath Propagation, Linear Time Variant, Channel Model, Channel Correlation Function, Large Scale Path Loss and Shadowing, Fading.

UNIT-2

Bandpass Transmission Technique for Mobile Radio- Signal Space and Decision Region, Digital Modulation-MPSK, MSK, GMSK, OFDA, Power Spectral Density, Probability of Transmission Error; Receiver Technique for Fading Dispersive Channels.

UNIT-3

CELLULAR COMMUNICATION-Frequency reuse and mobility Management, Cell Cluster Concept, Co Channel and Adjacent Channel Interference, Call Blocking and Delay at Cell Site, Cell Splitting, Sectoring;

UNIT-4

Multiple Access Technique, Random Access, Carrier Sense Multiple Access(CSMA), Conflict Free Multiple Access Technology and Spectral Efficiency-FDMA, TDMA, CDMA; Mobility management and In wireless network-CAC, Handoff Management, Location Management for Cellular Network and PCS network, Traffic calculation.

UNIT-5

Wireless Internetworking-Mobile IP , Internet Protocol (IP), Transmission Control Protocol (TCP), Network Performance, Wireless Application Protocol(WAP) , Mobile AD HOC Network

Course outcome:

- Have knowledge and understanding of basic mobile network architecture
- Have knowledge and understanding of some basic technologies that are in use
- Be able to make critical assessment of mobile systems
- Be able to analyze and propose broad solutions for a range of mobile scenarios

Text Books:1

1. WIRELESS COMUNICATION & NETWORKING by Mark & Zuang , PHI
2. Wireless Communications And Networks, WILLIAM STALLINGS , PHI

Reference Books:

1. Wireless Network Performance Handbook , by SMITH , McGraw- Hill
2. Principles Of Wireless Networks, By PAHLAVAN , PHI

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C. G.)**

Semester: **B.E. 7th**
Subject: **Advanced Database Management Systems**
Total Theory Periods: **50**
Total Marks in End Semester Exam: **80**
Minimum number of class tests to be conducted: **02**

Branch: **Information Technology.**
Code: 322750(22)
Total Tutorial Periods:
Assignments: **1 per Unit**

Course Objective

- Introduce basic concepts and major techniques in DBMS implementations. These include concepts and techniques for data storage, query processing, and transaction management.
- Introduce research development ability in databases.

UNIT- I DISTRIBUTED DATABASE DESIGN: Design strategies, Distribution design issues, Fragmentation, Allocation, Oracle DDB design, Distributed database system architecture, Date's rule for DDBS.

UNIT- II DATA REPLICATION & QUERY PROCESSING IN DDBS : Classification of replica control strategies, Consistency & Request ordering, The Gossip Architecture, Process groups & ISIS, Replication in Oracle, Query optimization in Centralized system, Objective of query processing, Query decomposition, Distributed query optimization algorithms, Query optimization in Oracle.

UNIT-III TRANSACTION PROCESSING & RECOVERY: Centralized & client server architecture, server systems architectures, parallel & distributed systems, distributed data storage, Transaction property, distributed transactions, commit protocols, concurrency control in distributed database, availability, heterogeneous distributed databases, Distributed deadlock management, recovery concepts, recovery techniques based on deferred update & on immediate update shadow paging, The ARIES Recovery Algorithm, Recovery in multi-database systems, database backup and recovery from catastrophic failures, Reliability concept & measure, Site failure & network partitioning, directory systems, Database recovery in Oracle.

UNIT- IV SECURITY MANAGEMENT & PL/SQL: Various aspect of database security, Basic model of database access control, TCSEC Policy identification, Security models, Identification-Authentication- Authorization, Statistical databases, Data encryption, Security in Oracle, JDBC, Purpose of PL/SQL, PL/SQL block, structure & type, PL/SQL syntax & programming.

UNIT-V DIFFERENT DATABASES: Parallel databases: Introduction, I/O parallelism. Interquery-intraquery-intraoperation interoperation parallelism design of parallel systems. Client/Server DBS, Oracle DBMS, Distributed processing in Oracle, Oracle network protocols, Network administration in Oracle. Theory of OO databases, Multimedia databases, Real time databases.

Course Outcome:

Upon completion of this course, students should be able to:

- Explain in detail DBMS architecture.
- Explain in detail query processing and techniques involved in query optimization.
- Explain the principles of concurrency control and recovery management.
- Explain the Security management in Databases

Text book:

1. Database system concepts , 4th edition, Silberschatz-Korth-Sudarshan, MH
2. Fundamentals of database systems 3rd edition, Elmasri & Navathe, Pearson education

References:-

1. Database concepts & systems ,2nd edition , Ivan Bayross, SPD
2. Database Management System, Rajesh Narang, PHI.
3. An Introduction to database systems, 7th edition, C.J. Date , Pearson education

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Operation Research

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 322742(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objective

- To introduce use quantitative methods and techniques for effective decisions–making; model formulation and applications those are used in solving business decision problems.
- To model decision making problems using major modeling formalisms of artificial intelligence and operations research, including propositional logic, constraints, linear programs and Markov processes,
- To evaluate the computational performance of search, satisfaction, optimization and learning algorithms.
- To apply search, satisfaction, optimization and learning algorithms to real world problems.

UNIT –1 Linear Programming: LP formulations, Graphical method for solving LP with 2 variables, Simplex method, Application of simplex method for maximization and minimization of LP problems, Artificial variable technique for finding the initial basic feasible solution, The Big-M method, Degeneracy in simplex method, Duality theory in LP, Dual simplex method.

UNIT-2: Transportation Model: North – West corner rule, Least cost method, Vogel's Approximation method, Modi Method, Assignment problem, Dynamic Programming: Basic concepts, Bellman's optimality principle, Dynamic programming approach in decision making, Optimal subdivision problem.

UNIT- 3: Inventory Model: Introduction to the inventory problem, Deterministic models, The classical EOQ (Economic order quantity) model, Purchasing model with no shortage, Manufacturing model with no shortage, purchasing model with shortage, Manufacturing model with shortage, Inventory models with probabilistic demand.

UNIT –4: Sequencing and Queuing Theory: Sequencing problem, Johnson's algorithm for processing N-jobs through 2 machine problem, N-jobs through 3 machine problem, 2- job through N machine by graphical method, Characteristics of queuing system- steady state M/M/1, M/M/1K and M/M/C queuing models.

UNIT- 5: CPM and PERT: Arrow network, Time estimates – Earliest expected time, Latest allowable occurrence time and slack, Critical path, Probability of meeting scheduled date of completion of project, Calculation on CPM network, Various floats for activities, Critical Path, Updating project, Operation time cost trade off curve & project time cost trade off curve, selection of schedule based on cost analysis.

Course Outcome:

- Identify and develop operational research models from the verbal description of the real system.
- Understand the mathematical tools that are needed to solve optimization problems.
- Develop a report that describes the model and the solving technique, analyze the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.

Name of Text Books:-

1. Operation Research, Panneerselvam, Prentice Hall of India
2. Operation Research: An Introduction - Hamdy a. Taha, Prentice Hall of India

Name of Reference Books:-

1. Gillett B.E, Introduction to Operation Research- A Computer Oriented algorithmic approach, Mc Graw Hill.
2. Kanti Swarup, Gupta.P.K.,Man Mohan, Operations Research, Sultan Chand & Sons.
3. Vohra N.D., Quantitative Techniques in Management, T.M.H.
4. Zoints. S.,Linear & Integer Programming,Prentice Hall.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: E-Commerce and Strategic IT

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 322743(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objective:

- To understand the business impact and potential of e-commerce
- To learn about the technologies required to make e-Commerce viable
- To learn e-commerce from an enterprise point of view
- To learn about the working of various electronic payment systems

UNIT –Introduction:

What is E-Commerce, Forces behind E-Commerce, E-Commerce Industry Framework, and Brief History of E-commerce. Inter Organizational E-Commerce, Intra Organizational E-Commerce, and Consumer to Business Electronic Commerce, Architectural framework

Unit–II -Network Infrastructure:

LAN, Ethernet (IEEE standard 802.3) LAN , WAN , Internet, TCP/IP Reference Model, Domain Name Server , Internet Industry Structure.

UNIT–III: Electronic payment systems:

Types of electronic payment systems, digital token-based electronic payment systems, smart cards & electronic payment systems, credit card based electronic payment systems, risk and electronic payment systems, designing electronic payment systems.

UNIT–IV: Information Distribution and Messaging:

FTP,E-Mail, www server, HTTP, Web service implementation, Information publishing , Web Browsers, HTML, Common Gateway Interface

UNIT –V: Mobile & wireless computing fundamentals:

Mobile computing framework, wireless delivery technology and switching methods, mobile information access devices, mobile data internetworking standards, cellular data communication protocols, mobile computing applications, personal communication service.

Course outcome: After successful completion of the course, students

- Will be able to apply the skills necessary for large-scale web based e-commerce project development.
- Will be able to work on information distribution and messaging services in e-commerce application.
- Will be able to work on business applications of wireless and mobile technologies for e-commerce.

Text books:

1. Frontiers of E-commerce by Kalakota & Whinston, Addison Wesley.
2. E-business road map for success by Dr. Ravi Kalakota& Marcia Robinson, Addison Wesley.

Reference book:

3. Electronic Commerce by Bharat Bhasker, TMH.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII
Subject: Natural Language Processing
Total Theory Periods: 50
Total Marks in End Semester Exam: 80

Branch: Information Technology.
Code: 322744(22)
Total Tutorial Periods: NIL
Minimum number of CT to be conducted: 02

Course objective:

1. To understand the concepts of morphology, syntax, semantics and pragmatics of the language.
2. To recognize the significance of pragmatics for natural language understanding
3. To describe the simple system based on logic and demonstrate the difference between the semantic presentation and interpretation of that presentation
4. To describe the application based on natural language processing and to show the points of syntactic, semantic and pragmatic processing

Unit –I: Introduction and syntactic processing

The study of Language, Linguistic background, Grammars and Parsing, Features and Augmented Grammars, Grammars for Natural Language, towards efficient parsing, Ambiguity Resolution.

Unit –II: Semantic interpretation

Semantics and Logical Form, Linking Syntax and Semantics, Ambiguity Resolution, Strategies for Semantic Interpretation, Scoping and the Interpretation of Noun Phrases.

Unit –III: Pragmatics

Discourse: Reference Resolution, Syntactic and Semantic coherence, Text Coherence, An Inference based resolution algorithm. Dialogue and Conversational Agents: What makes dialogue different? Dialogue structure and coherence.

Unit –IV: Natural Language generation

Introduction to language generation, architecture for generation, surface realization, systemic grammar, functional unification grammar, discourse planning.

Unit –V: Machine translation

Language Similarities and Differences, transfer metaphor, syntactic transformations, lexical transfer, idea of Interlingua, direct translation, using Statistical Techniques

Course Outcomes: After successful completion of the course, students

1. Can set up, implement and evaluate natural language technology experiment step by step
2. Will be familiar with a sample of machine learning techniques and can assess which ones are suitable for a given problem
3. Can explain the interaction between rule based and probabilistic methods in language technology.

Text Books:

1. Speech and Language Processing, by Jurafsky, D. & Martin, J.H.
2. Natural Language Understanding, Allen, J

Reference Books:

1. Foundations of General Linguistics by Atkinson, M, Kilby, D A & Roca, I
2. An Introduction to Language by Fromkin, V & Rodman, R
3. Natural Language Processing for Prolog Programmers by Covington, M A
4. Natural language processing in Prolog: an introduction to computational linguistics by Gazdar, G& Mellish.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII
Subject: Object oriented DBMS (OODBMS)
Total Theory Periods: 50
Total Marks in End Semester Exam: 80

Branch: Information Technology.
Code: 322745(22)
Total Tutorial Periods: NIL
Minimum number of CT to be conducted: 02

Course objective:

1. This course discusses the requirements for advanced database features in database applications.
2. Introduce Parallel and Distributed databases.
3. Understand the enhanced data models for advanced applications
4. Examines the concepts of various emerging database technologies.

UNIT I: The extended Entity- Relationship Model and Object model:

The ER model revisited, Motivation for complex data types, User defined abstract data types and structured types, Subclasses, Super classes, Inheritance, Specialization and Generalization, Constraints and characteristics of specialization and Generalization, Relationship types of degree higher than two.

UNIT II: Object oriented databases:

Overview of Object-Oriented concepts, Object identity, Object structure, and type constructors, Encapsulation of operations, Methods, and Persistence, Type hierarchies and Inheritance, Type extents and queries, Complex objects; Database schema design for OODBMS; OQL, Persistent programming languages; OODBMS architecture and storage issues; Transactions and Concurrency control, Example of ODBMS.

UNIT III: Object relational and extended relational databases:

Database design for an ORDBMS - Nested relations and collections; Storage and access methods, Query processing and Optimization; An overview of SQL3, Implementation issues for extended type; Systems comparison of RDBMS, OODBMS, ORDBMS

UNIT IV: Parallel and distributed database and Client server architecture:

Architectures for parallel databases, Parallel query evaluation; Parallelizing individual operations, Sorting, Joins; Distributed database concepts, Data fragmentation, Replication, and allocation techniques for distributed database design; Query processing in distributed databases; Concurrency control and Recovery in distributed databases. An overview of Client-Server architecture.

UNIT V: Databases on the web and semi structured data:

Web interfaces to the Web, Overview of XML; Structure of XML data, Document schema, Querying XML data; Storage of XML data, XML applications; The semi structured data model, Implementation issues, Indexes for text data. **Enhanced Data Models for Advanced Applications:** Active database concepts. Temporal database concepts. Spatial databases, Concepts and architecture; Deductive databases and Query processing; Mobile databases, Geographic information systems.

Course outcome: After successful completion of the course, students will be

1. Able to understand the needs and concepts of object-oriented database, spatial database, web database, data warehousing and data mining.
2. Able to analyze, design and evaluate the construct of various advanced databases such as object-oriented, object-relational, semi-structured, unstructured and distributed databases.
3. Be able to implement practical solutions to GIS database problems using OO/OR database, spatial database, data warehousing and data mining approaches.

Text Books:

1. Object Oriented Interfaces and Databases, Rajesh Narang, Prentice Hall of India
2. Database Management Systems, Raghu Ramakrishnan, Johannes Gehrke, McGraw-Hill

Reference books:

1. Fundamentals of Database Systems, Elmasri and Navathe, Pearson Education
2. Database System Concepts, Korth, Silberchatz, Sudarshan, McGraw-Hill.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Cloud computing

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 322746(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course objective:

1. Cloud computing represents a latest in the long history computing mainframe, Personal computing networked computing and expected to revolutionize the business is done.
2. This course covers the theoretical and practical aspects of cloud computing. At the end of the course, student will be able to appreciate the cloud computing paradigm, recognize its various forms and able to implement some cloud computing features.

UNIT I Introduction to Cloud Computing, The Emergence of Cloud Computing, Cloud-Based Service Offerings, Benefits of using a Cloud Model, Key Characteristics of Cloud Computing, Understanding- Public & Private cloud environments, The Evolution of Cloud Computing – Hardware & Internet Software Evolution.

UNIT II Cloud Security Challenges, Software-as-a-Service, Security Management People, Security Governance, Security Portfolio Management, Security Architecture Design, Identity Access Management (IAM), Data Security.

UNIT III Cloud as: Communication-as-a-Service (CAAS), Infrastructure-as-a-Service (IAAS), Monitoring-as-a-Service (MAAS), Platform-as-a-Service (PAAS), Software-as-a-Service (SAAS).

UNIT IV The MSP Model, Evolution from the MSP Model to Cloud Computing and Software-as-a-Service, TheCloud Data Center, Basic Approach to a Data Center-Based SOA, Open Source Software, Service- Oriented Architectures as a Step Toward Cloud Computing.

UNIT V Virtualization concepts & Smartphone: virtualization benefits, Hardware virtualization, Software Virtualization, Memory Virtualization, Storage Virtualization, Data Virtualization, Network Virtualization, Virtualization Security Recommendations, Introduction to Various Virtualization OS VMware , KVM, Virtual Machine Security, Smartphone, Mobile Operating Systems for Smartphone's (iPhone, Windows Mobile), Google(Android) Blackberry, Ubuntu Mobile Internet.

Course Outcome:

1. Students will be able to perform cloud oriented analysis.
2. Students will be able to model cloud candidate derived from existing business documentation.
3. Students will be able to design the composition of a cloud services.
4. Students will be able to design application services for technology abstraction.

Text Books:

1. Toby Velte, Anthony Vote and Robert Elsenpeter, "Cloud Computing: A Practical Approach", McGraw Hill, 2002.

Reference Books:

1. George Reese, "Cloud Application Architectures: Building Applications and Infrastructures in the Cloud", O'Reilly Media, 2003.
2. Tim Mathern, SubraKumaraswamy and ShahedLatif, "Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance", O'Reilly Media, 2005.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Grid Computing

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 322747(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course objective:

- To understand the need for and evolution of Grids in the context of processor- and data-intensive applications
- To be familiar with the fundamental components of Grid environments, such as authentication, authorization, resource access, and resource discovery

UNIT I: Concepts and Architecture:

Introduction-Parallel and Distributed Computing-Cluster Computing-Grid Computing Anatomy and Physiology of Grid- Web and Grid Services-Grid Standards - OGSAWSRF- Trends, Challenges and applications.

UNIT II: Grid Monitoring: GRID MONITORING

Grid Monitoring Architecture (GMA) - An Overview of Grid Monitoring Systems- R-GMA –Grid ICE – MDS- Service Level Agreements (SLAs) - Other Monitoring Systems Ganglia, Grid Mon, Hawkeye and Network Weather Service.

UNIT III: Grid Security and Resource Management:

Grid Security-A Brief Security Primer-PKI-X509 Certificates-Grid Security-Grid Scheduling and Resource Management, Gridway and Gridbus Broker-principles of Local Schedulers- Overview of Condor, SGE, PBS, LSF- Grid Scheduling with QoS.

UNIT IV: Data Management and Grid Portals

Data Management-Categories and Origins of Structured Data-Data Management Challenges-Architectural Approaches-Collective Data Management Services-Federation Services-Grid Portals-Generations of Grid Portals.

UNIT V: Grid Middleware

List of globally available Middlewares - Case Studies-Recent version of Globus Toolkit and gLite - Architecture, Components and Features. Features of Next generation grid.

Course Outcome: After successful completion of the course students will be

- be able to justify the applicability, or non-applicability of Grid technologies for a specific application
- be able to evaluate enabling technologies such as high-speed links and storage area networks for building computer grids;
- be able to design a grid computing application in one of the key application areas e.g. Computer Animation, E-Research;

Text Books:

1. Ian Foster, Carl Kesselman, The Grid 2: Blueprint for a New Computing Infrastructure, Elsevier Series, 2004.
2. Parvin Asadzadeh, Rajkumar Buyya, Chun Ling Kei, Deepa Nayar, and Srikumar Venugopal, High Performance Computing: Paradigm and Infrastructure, Wiley Press.

Reference Books:

1. Vladimir Silva, Grid Computing for Developers, Charles River Media, January 2006.
2. Jarek Nabrzyski, Jennifer M. Schopf, Jan Weglarz, Grid Resource Management: State of the Art and Future Trends , (International Series in Operations Research & Management Science), Springer; First edition, 2003
3. Fran Berman , Geoffrey Fox, Anthony J.G. Hey, Grid Computing: Making The Global Infrastructure a Reality,Wiley, 2003
4. Maozhen Li , Mark Baker , The Grid: Core Technologies, Wiley, 2005
5. Joshy Joseph , Craig Fellenstein Grid Computing, IBM Press, 2004 19
6. Borja Sotomayor , Lisa Childers, Globus Toolkit 4 : Programming Java Services , The Elsevier Series in Grid Computing, Morgan Kaufmann, 2005.