

DEVI AHILYA VISHWAVIDYALAYA, INDORE



FACULTY OF ENGINEERING

**SCHEME OF EXAMINATION
&
COURSE OF CONTENTS**

**BE IV Year Programme
(INFORMATION TECHNOLOGY)**

INSTITUTE OF ENGINEERING & TECHNOLOGY
(www.iet.dauniv.ac.in)

B.E. IV YEAR – INFORMATION TECHNOLOGY

TH- Theory, CW – Class Work, SW – Sessional Work, PR – Practical

Semester- VII

S. No.	Sub. Code	Subject	Maximum Marks						
			L	P	TH	CW	SW	PR	TOTAL
1.	4IT401	Project -II	-	4	-	-	100	50	150
2.	4IT402	Artificial Intelligence	4	2	100	50	50	50	250
3.	4IT403	Enterprise Computing Techniques	4	2	100	50	50	50	250
4.	4IT404	Very Large Databases	4	2	100	50	50	50	250
5.		Elective-I	4	-	100	50	-	-	150
TOTAL			16	10	400	200	250	200	1050

Semester- VIII

S. No.	Sub. Code	Subject	Maximum Marks						
			L	P	TH	CW	SW	PR	TOTAL
1.	4IT451	Multimedia Computing	4	-	100	50	-	-	150
2.	4IT452	Object Oriented Design	4	2	100	50	50	50	250
3.	4IT453	Network & Information Security	4	2	100	50	50	50	250
4.	4IT454	Wireless Protocols & Mobile Computing	4	2	100	50	50	50	250
5.		Elective- II	4	-	100	50	-	-	150
TOTAL			20	6	500	250	150	150	1050

List of Elective Subjects**Semester VII Elective – I**

S. No.	Sub. Code	Name of Subject
1.	4IT405	Software Architecture
2.	4IT406	Performance Evaluation of Computer Networks
3.	4IT407	Information Theory
4.	4IT408	VLSI Design
5.	4IT409	Embedded Systems

Semester VIII Elective – II

S. No.	Sub. Code	Name of Elective
1.	4IT455	Cloud Computing
2.	4IT456	Digital Signal Processing
3.	4IT457	Medical Informatics
4.	4IT458	Information Retrieval & Extraction
5.	4IT459	Telematics & ISDN

Devi Ahilya University, Indore, India Institute of Engineering & Technology		BE IV Year Information Technology					
Subject Code & Name 4IT402 Artificial Intelligence	Periods Hours/ Week Lectures- 4 Tutorials-0 Practical- 2	Marks	Th	CW	SW	Pr	Total
		Max	100	50	50	50	250
Duration of Theory Paper: 3 Hours		Min	35	25	25	25	110

Objective: To introduce the concepts of making computer systems intelligent through computational methods and techniques.

Course of Contents

Unit-I

AI and AI Techniques; Problems, Problem space and State space; Production systems; Search techniques and algorithms.

Unit-II

Knowledge Representation- Issues and Methods; Predicate logic- resolution and unification; Forward and backward Reasoning; Logic programming & Prolog.

Unit-III

Symbolic computation- Uncertainty; Rule based systems; Statistical Reasoning; Fuzzy Logic; Expert systems; Decision support systems.

Unit-IV

Semantic networks; Frames and Scripts; Conceptual Dependency; Game playing; Planning overview; Understanding; Learning.

Unit-V

Natural language processing- parsing, semantic analysis, ATN and RTNs; Connectionist models- neural networks; Speech and vision processing; Robotic actions.

Books Recommended:

- [1] E Rich, K Knight, Artificial Intelligence, 2/e, McGraw Hill, 1991.
- [2] S Russell, P Norvig, Artificial Intelligence: A Modern Approach, 2/e, Pearson Education (PH), 2003.
- [3] D W Patterson, Introduction to Artificial Intelligence and Expert Systems, PHI, 2007.
- [4] P Winston, Artificial Intelligence, 3/e, Addison Wesley, 1992.

Devi Ahilya University, Indore, India Institute of Engineering & Technology		BE IV Year Information Technology					
Subject Code & Name 4IT403 Enterprise Computing Techniques	Periods Hours/ Week Lectures- 4 Tutorials-0 Practical- 2	Marks	Th	CW	SW	Pr	Total
		Max	100	50	50	50	250
Duration of Theory Paper: 3 Hours		Min	35	25	25	25	110

Objective: To understand the concepts of building enterprise-class distributed applications in Java.

Prerequisites: Programming in of Java, Basics of Server Side Programming in Java.

Course of Contents

Unit-I

RMI: Object serialization, Developing Applications with RMI, the RMI security manager, Parameters passing in RMI, Object serialization. JNDI: Naming services, Directory services, Benefits of JNDI, JNDI Architecture, JNDI concepts

Unit-II

Overview & EJB Fundamentals: Motivation for EJB, Component architecture, Various roles in J2EE architecture, Type of beans, Distributed object & Middleware, Constituents of enterprise beans: Enterprise beans class, EJB Object, Home object, Local interfaces, Remote Interfaces, Deployment descriptor, Vendor specific files.

Unit-III

Session Beans: Stateless session beans, Stateful session beans, characteristics of stateful session beans, life cycle diagram for session beans. JMS, Integrating JMS with EJB, Developing message driven beans.

Unit-IV

Entity Beans: Persistence concepts, Features of entity beans, Bean managed Persistent entity beans, Container managed persistent entity beans, Life cycle Diagrams of BMP entity bean and CMP entity bean.

Unit – V

Transactions: - Motivation for Transactions, The ACID properties, Transactional methods, Declarative, Programmatic, and client initiated transactions, Container Managed Transactions
BMP and CMP Relationships: - The CMP and BMP difference, Cardinality:-1:1 relationships, 1: N relationships and M: N relationships

Books Recommended:

1. Ed Roman “Mastering Enterprise JavaBeans”, Wiley Publishing, 3rd Edition,2005.
2. J2EE Tutorial from www.java.sun.com.
3. Kal Ahmed “Professional JAVA server programming”, SPD, 2005.

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE IV Year (Information Technology)					
Subject Code & Name	Instructions Hours per week			Marks					
4IT404 Very Large Databases	L	T	P		TH	CW	SW	PR	Total
Duration of Theory Paper 3 Hours	4	0	2	Max	100	50	50	50	250
				Min	35	25	25	25	110

Objective: To provide knowledge of data warehouse & data mining tasks & techniques.

Prerequisite: Knowledge of Database Management System.

Course of Contents

UNIT I - Introduction

Introduction to Data warehouse, OLTP, OLAP, Data Mining, Processes within data warehouse, Extraction, Loading, Cleaning, Transformation of data, Data warehouse, Multidimensional Model, Schemas for Multidimensional database, Defining Star, Snowflake and Fact Constellation. Concept Hierarchy.

UNIT II - Architecture

Design & Construction of Data Warehouses, Three- Tier Data Warehouse Architecture, Data Mining Primitives, DMQL. Architecture of Data Mining System.

UNIT III - Data Mining: Associations, Correlations & Cluster Analysis

Data mining techniques, Association rules mining, Apriori Algorithm, cluster analysis, Types of data in clustering analysis, categorization of major clustering methods.

UNIT IV - Classification and Prediction

Issues regarding classification and prediction, Classification by decision tree induction, Bayesian classification, Rule-based classification, Classification by back-propagation, Association Classification, Other classification methods, Prediction.

UNIT V - Advanced Topics

Web Mining, Web concept mining, Web structure mining, Web Usage mining. Spatial Mining, KDD Process.

Books Recommended:

- [1] Han and Kamber, Data Mining Concepts & Techniques, Morgan. Kaufman, India 2001.
- [2] Sam Anahory and Dennis Murray, Data Warehousing in the real World, Pearson Education Asia, 2000.
- [3] W. H. Inmon, Building the Data Warehouse, 4th Ed Wiley dreamtech India, 2005.
- [4] [Z. Markov](#), [Daniel T. Larose](#) Data Mining the Web, Jhon wiley & son, USA, 2007.

Devi Ahilya University, Indore, India Institute of Engineering & Technology		BE IV Year Information Technology					
Subject Code & Name	Periods Hours/ Week	Marks	TH	CW	SW	Pr	Total
4IT405 Software Architecture	Lectures- 4	Max	100	50	-	-	150
Duration of Theory Paper: 3 Hour	Tutorials-0 Practical- 0	Min	35	25	-	-	60

Objective: To give exposure to the students on latest development in the field of software architecture required for large scale applications.

Prerequisite: Nil.

Course of Contents

Unit - I

Software Architecture Terminology: Components, Relationship, Views, Styles, Layering, Frameworks, Patterns, Processes, Methodologies, Functional and Non-functional Properties of Software Architectures.

Unit – II

Techniques for evolving Software Architecture: Abstraction, Encapsulation, Information Hiding, Modularity, Separation of Concerns, Coupling and Cohesion, Sufficiency, Completeness and Primitiveness, Separation of Policy & Implementation, Separation of Interface and Implementation.

Unit- III

Architectural Styles: Pipes and Filters, Information Abstraction and Object-Oriented, Event-Based, Implicit Invocation, Layered Systems, Repositories, Interpreters, Heterogeneous Architectures.

Unit - IV

Software Architecture Implementation - Development environment facilities: code generation, Reverse Engineering, Forward Engineering, Profiling, Software libraries, Testing and Debugging.

Unit-V

Quality issues in software architecture: Changeability, Efficiency, Interoperability, Reliability, Testability, Reusability, Fault tolerant software.

Books Recommended:

[1]M. Shaw: Software Architecture Perspectives on an Emerging Discipline, Prentice-Hall, 1996.

[2]Len Bass, Paul Clements, Rick Kazman, Software Architecture in Practice, Pearson Education, 2002.

Devi Ahilya University, Indore, India Institute of Engineering & Technology		BE IV Year Information Technology					
Subject Code & Name	Periods Hours/ Week	Marks	TH	CW	SW	Pr	Total
4IT451 Multimedia Computing	Lectures- 4	Max	100	50	-	-	150
Duration of Theory Paper: 3 Hour	Tutorials-0 Practical- 0	Min	35	25	-	-	60

Objective: To give exposure to the students on latest development in the field of Multimedia and related fields.

Prerequisite: Computer Graphics and fundamentals of Information Theory.

Course of Contents

Unit-I Multimedia: Introduction and Applications

Components of multimedia, Fundamentals of Information theory, Multimedia Authoring tools, Basics of Data Compression: - Run-length, Huffman, Arithmetic, Dictionary based data compression.

Unit-II Fundamentals of Image

Image and graphics: digital image representation and computer image processing, Halftoning, Dithering, Various image formats, Color Models, image compression standards JPEG, JPEG2000, JPEG-LS.

Unit-III Basics of Digital Audio

Sound/Audio: basic Concepts, analysis & Transmission, MIDI concepts, Audio memory representation, Sound/Audio compression techniques: ADPCM, G.726 ADPCM, MP3.

Unit-IV Basics of Video

Types of video signals, Analog video, Digital video, Basic Video compression techniques: H.261, H.263, MPEG1, MPEG2, MPEG4, MPEG7.

Unit-V Multimedia Network Communication

Issues of Multimedia Communication, Data Transmission, Multimedia over IP and ATM network, Transportation of MPEG4, Media-on- Demand, Multimedia over Wireless Network,

Books Recommended:

- [1] Ralf Steinmetz & Klara Nahrstedt, Multimedia: Computing, Communications & Applications, Pearson Education Asia
- [2] Tay Vaughan, Multimedia: Making It Work, McGrawhill, Osborne Media
- [3] Jerry D. Gibson, Multimedia Communications, Directions and Innovations
- [4] J.Jeffcoate, Multimedia in practice, Technology & Application, PHI 1995.
- [5] Ze-Nian-Li, Fundamentals of Multimedia, Pearson Education
- [6] S. Annadurai & R. Shanmugalakshmi, Fundamentals of Digital Image Processing Pearson Education

Devi Ahilya University, Indore, India Institute of Engineering & Technology		BE IV Year Information Technology					
Subject Code & Name 4IT452 Object Oriented Design	Periods Hours/ Week Lectures- 4 Tutorials-0 Practical- 2	Marks	Th	CW	SW	Pr	Total
Duration of Theory Paper: 3 Hours		Max	100	50	50	50	250
		Min	35	25	25	25	110

Objective: To learn object oriented analysis, modelling and design using UML. To learn object oriented approach of software engineering.

Prerequisite: Knowledge of object oriented programming and basics of software engineering.

Course of Contents

Unit-I

Rational Unified Process, Process Notation, Business Modeling Workflow, Review of Object Orientation, definition of OOA, OOD and OOP

Unit -II

Object Oriented Analysis: Requirements Overview, Problem Statement, Glossary, Use-Case Model, Supplementary Specifications, Analysis and Design Overview Architectural Analysis: Analysis Mechanisms, Key Abstractions, Pattern, Frame, Initial Architectural Layers, Use Case Analysis: finding classes from use case behavior, describe responsibility, attribute and association, qualify analysis mechanism

Unit – III

Architectural Design: Design & Implementation Mechanisms, Design Classes & Subsystems, Reuse opportunities Use-Case Design: Interactions between Design Objects, Persistence-Related Behavior, Refine the Flow of Events Description, Unify Classes and Subsystems

Unit – IV

Subsystem Design: Subsystems and Interfaces, Distribute Subsystem Behavior to Subsystem Elements, Document Subsystem Elements, Subsystem Dependencies Class Design: Create Initial Design Classes, Identify Persistent Classes, Define Operations, Class Visibility, Methods, States, Attributes, Dependencies, Associations, Generalizations, Resolve Use-Case Collisions

Unit – V

Concurrency and Distribution Overview, UML, case study of OOAD application

Books Recommended:

- [1] Grady Booch, Object Oriented Analysis & Design with Application, Pearson Education India 2nd Edition.
- [2] Scott W. Ambler, The Object Primer, Cambridge University Press, 2nd Edition.
- [3] Philippe Kruchten, The rational Unified Processes & Introduction Pearson Education India 2nd Edition.
- [4] Grady Booch, Games Rumbaugh, Ivar Jacobson, The Unified Modeling Language User Guide, Addison Wesley
- [5] M. Blaha, J. Rumbaugh, Object Oriented Modeling and Design with UML, Pearson Education 2nd Edition, 2007.

Devi Ahilya University, Indore, India Institute of Engineering & Technology		BE IV Year Information Technology					
Subject Code & Name 4IT453 Network & Information Security	Periods Hours/ Week Lectures- 4 Tutorials-0 Practical- 2	Marks	Th	CW	SW	Pr	Total
		Max	100	50	50	50	250
Duration of Theory Paper: 3 Hours		Min	35	25	25	25	110

Objective: To impart the knowledge of encryption and decryption techniques and their applications in managing the security of data.

Pre-requisite: NIL

Course of Contents

UNIT-I

The need for security, security approaches, principles of security, services, mechanisms & attacks, model for network security. Plain & Cipher text, substitution & transposition techniques, play fair cipher, hill cipher, stenography, key range & key size.

UNIT-II

Diffie-Hellman key exchange. An overview of symmetric key cryptography, Algorithm types & modes, possible types of attacks, Symmetric & asymmetric cipher model, Data Encryption Standard (DES), Advanced Encryption Standard (AES).

UNIT-III

Brief history & overview of asymmetric key cryptography, RSA algorithm, asymmetric & symmetric key cryptography together, digital envelopes, digital signatures & digital certificates & Public key infrastructure (PKI).

UNIT-IV

Secure Socket Layer, Secure Hyper Text Transfer Protocol (SHTTP), Time Stamping Protocol (TSP), 3-D Secure Protocol, Email Security, Kerberos.

UNIT-V

Introduction, brief introduction to TCP/IP, Firewalls, IP Security, Virtual Private Networks, Intrusion detection system, IP spoofing, DNS spoofing.

Books Recommended:

- [1] Douglas R. Stinson; *Cryptography Theory and Practice*; 2nd Edition, Chapman & Hall/CRC
- [2] Williams Stallings; *Cryptography & Network Security*; 3rd Edition, Pearson Education

Devi Ahilya University, Indore, India Institute of Engineering & Technology		BE IV Year Information Technology					
Subject Code & Name 4IT454 Wireless Protocols & Mobile Computing	Periods Hours/ Week Lectures- 4 Tutorials-0 Practical- 2	Marks	Th	CW	SW	Pr	Total
		Max	100	50	50	50	250
Duration of Theory Paper: 3 Hours		Min	35	25	25	25	110

Objective: To give exposure to the students on wireless communication with emphasis on protocol design and computing on mobile nodes.

Course of Contents

Unit I

Introduction, Wireless Networks, Wireless VS Wired Networks, Mobile Devices, Mobile Applications, Mobile Environment and limitations, Wireless transmission, Multiplexing, Modulation, Spread spectrum-DSSS & FHSS

Unit II

Cellular networks- overview, Cellular Concept, Frequency Reuse, Channel Allocation, Call Setup, Cell Handoffs, Location Management, Medium Access Control-motivation for specialized MAC, SDMA, FDMA, TDMA, Reservation Aloha, PRMA, MACA, DSMA, CDMA, GSM-Basics, GSM-Air Interface, protocols, localization & calling

Unit III

Wireless LANs, 802.11 System & Protocol Architecture, MAC layer-DFWMAC-DCF with CSMA/CA, CTS/RTS extension & polling, MAC management, Mobile IP, TCP over wireless, TCP and mobility

Unit IV

Designing mobile applications, Mobile agents transcoding and proxy architecture, wireless web and WAP, J2ME basics, Mobile Application development using J2ME, Data broadcasting, and Location based computing,

Unit V

Information management: data dissemination and broadcast models, mobile database and mobile transaction, location-Independent and location-dependent computing models, Human-computer interactions: reduced user interfaces, wearable and pervasive computing; Use of XML & UML in mobile interfaces

Books Recommended:

- [1] J Schiller, Mobile Communications, Pearson Education, 2003
- [2] W. Stalling, Wireless Communications & Networks, Pearson Education, 2/e, 2005
- [3] A Talukdar, RYavagal, Mobile Computing: Technology, Applications & Service Creation, McGrawHill, 2006
- [4] Reza B'Far, Mobile Computing Principles; Designing and Developing Mobile Applications with UML and XML, Cambridge University Press, 2005.
- [5] James Keogh, The Complete Reference J2ME, Tata McGraw Hill, 2003

Devi Ahilya University, Indore, India Institute of Engineering & Technology		BE IV Year Information Technology					
Subject Code & Name 4IT455 Cloud Computing	Periods Hours/ Week Lectures- 4 Tutorials-0 Practical- 0	Marks	TH	CW	SW	Pr	Total
Duration of Theory Paper: 3 Hour		Max	100	50	-	-	150
		Min	35	25	-	-	60

Course of Content

Objective: To Introduce the cutting edge technology in Internet Computing Technology.

Prerequisite: Fundamentals of Network Technology, Fundamentals of Internet Technology.

Unit-I Introduction to Cloud Computing

Cloud introduction and overview, Cloud Computing Technology, Hardware & software Infrastructure, Different clouds, Risks, Cloud Services, Applications, Regulatory Issues, and Limitations.

Unit-II Cloud Computing Architecture

Requirements, Introduction Cloud computing architecture, various kind of Cloud computing architecture, Grid Computing, Transactional Computing ,On Demand Computing, Distributed Computing.

Unit-III Virtualization

Virtualization at the infrastructure level, CPU Virtualization, Storage Virtualization, Network Virtualization, A discussion on Hypervisors, SAN, ISCSI, VLAN. Scaling a Cloud Infrastructure.

Unit-IV Security

Security issues in cloud computing, Data Security: Data Control, Encryption, Regulatory and Standard Compliance, Network security: Firewall Rules, Network Intrusion Detection, Host Security aspects:

Unit-V Disaster Management

Disaster Recovery Planning: Recovery Point Objectives, Recovery Time Objectives, Disaster management in cloud: Backup management Geographic redundancy, Disaster Management: Monitoring, Load Balancing, Database Recovery.

Books & References:

- [1] Cloud Application Architectures. George Reese. Publication O'Reilly,2009
- [2] Cloud Computing: A Practical Approach. Anthony T.Velte, Tobe J.Velte, Robert Elsenpeter. Publication Pearson Education.,2009
- [3] White Papers on Cloud Computing