

GUJARAT UNIVERSITY-T.Y.BCA SYLLABUS (Revised)
Effective from June, 2007

TEACHING AND EXAMINATION SCHEME

SUB NO	SUBJECT	TEACHING		EXAMINATIONS				
		HRS PER WEEK		INTERNAL		EXTERNAL		TOTAL
		THEORY	PRACT	SESSIONAL	TERM WORK	THEORY 3 HRS	PRACT 3 HRS	
	Passing Marks			7	4	25	18	
BCA301	Data Communication And Networks	3	-	20	10	70	-	100
BCA302	Database Management System	3	2	20	10	70	50	150
BCA303	Internet Technologies and Programming	3	2	20	10	70	50	150
BCA304	Multimedia and Applications	3	2	20	10*	70	Viva 50	150
BCA305	Web Site Development And E-Commerce	3	2	20	10*	70	Viva 50	150
BCA 306	ELECTIVE							
Optional Subject (Any one)	1. Software Project Management.	3	2	20	10	70	-	100
	2. Enterprise Resource Planning and Data Warehousing.	3	2	20	10	70	-	100
	3. Data Security.	3	2	20	10	70	-	100
	4. Object Oriented Technology	3	2	20	10	70	-	100
	Passing Marks				18	-	54	
BCA 307	System Development Project	-	4	-	50	-	150	200
TOTAL		18	14	120	110	420	350	1000

* Minor Project Work. Viva based on Minor Project Work.

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BCA 301 DATA COMMUNICATION AND NETWORKS

TEACHING		EXAMINATIONS				
HRS PER WEEK		INTERNAL		EXTERNAL 3HRS		
THEORY	PRACT	SESSIONAL	TERM WORK	THEORY	PRACT	TOTAL
3	-	20	10	70	-	100

DATA COMMUNICATION

(15%)

Introduction- The telephone system, Standards organizations, History and Applications of data communications; Fundamentals of data communications- Signal representation, digital and analog signals, modems, data codes, Unicode, telecommunications and voice communications.

COMMUNICATIONS MEDIA AND EQUIPMENT

(20%)

Conducted media-Twisted pair, coaxial and fiber-optic cable, Radiated media- broadcast radio, microwave, cellular radio, SS radio, Media selection- cost, speed, errors and security, Computers and terminals, Network configurations, Terminal interfaces;

Multiplexers- FDM, TDM, STDM, WDM, FDMA, TDMA, CDMA, multiplexer configurations, Concentrators, Front-end processors, Controllers, Protocol converters, Ancillary equipment.

DATA TRANSMISSIONS AND PROTOCOLS

(20%)

Analog modulation- AM, FM, PM, QAM, Digital modulation- digital to analog, analog to digital and digital to digital modulation, Transmission directions-simplex, half-duplex, full-duplex, Modes- serial, parallel, Synchronization- asynchronous, synchronous, Errors- detection, correction, prevention, Data Transmission- ISDN, DSL, LMDS

Protocols –OSI, Wide Area Network protocols, Internet protocols, Local Area Network protocols, Wireless protocols.

COMPUTER NETWORKS

(15%)

Basic concepts, Networking techniques- switched, broadcast, Routing, Network ownership, Network types- WAN, LAN, Internet, Intranet, Distributed systems- implementation.

Wide Area and Metropolitan Area Networks, connections, topologies, SNA, SAA, DNA, EnVISN architectures, Metropolitan Area Network implementations.

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COMMUNICATION SERVICES **(10%)**

Switched circuits- DEMARC, LEC, VPN, ISDN, Dedicated circuits- voice grade, wideband, T-carrier, DSL, SONET, Fast packet services- X.25, Frame relay, ATM, SMDS, AIN, MPLS.

LOCAL AREA NETWORKS **(10%)**

LAN Hardware, topologies, protocols, types of LAN, LAN Software, high speed LANs, LAN interconnections- repeaters, bridges, router, gateways.

NETWORK SECURITY AND MANAGEMENT **(10%)**

Physical security, Software security, Digital signatures, Security issues.

Network management- objectives, meeting the objectives, Management of wireless networks, Network monitoring tools.

TEXT BOOK :

- Business Data Communications : Shelly / Cashman / Serwatka (Thomson Publishers)

REFERENCE :

- Data Communication and Networking : Dr. M. Jain, Satish Jain (BPB)
- Data Communication and Computer Networks : Brijendra Singh (PHI)

• **NO PRACTICALS :**

- TERM WORK SHOULD BE BASED ON SYLLABUS ONLY.



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BCA302 DATABASE MANAGEMENT SYSTEM

TEACHING		EXAMINATIONS				
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THEORY	PRACT	SESSIONAL	TERM WORK	THEORY	PRACT	TOTAL
3	2	20	10	70	50	150

• **Part I : Database Concepts**

FILE SYSTEM AND DATABASES

(10%)

Introducing the database, the historical roots of the database, a file system critique, database systems, database models

THE RELATIONAL DATABASE MODEL

(20%)

Logical view of data, keys, integrity rules, relational database operators, the data dictionary and system catalog, relationship within the relational database, data redundancy, index

• **Part II : Design and Implementation Concepts**

E-R MODELING

(10%)

Basic modeling concepts, data models : degree of data abstraction, the E-R model(with example)

NORMALIZATION OF DATABASE TABLES

(10%)

Database tables and normalization, normalization and database design(with example), higher level normal forms, de-normalization.

STRUCTURED QUERY LANGUAGE (SQL)

(20%)

Introduction to SQL, Data Definition commands, data manipulation commands, queries, advanced data management commands, complex queries, updatable views, converting and E-R model into a Database structure(with example), rules governing relationship among tables.

• **Part III : Advanced Database Concepts**

TRANSACTION MANAGEMENT AND CONCURRENCY CONTROL

(20%)

What is transaction, properties, transaction log, concurrency control, concurrency control with locking methods, concurrency control with time stamping methods, concurrency control with Optimistic methods, database recovery.

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DISTRIBUTED DATABASE MANAGEMENT SYSTEMS (10%)

Advantages, disadvantages, distributed database and distributed processing, DDBMS components.

TEXT BOOK :

- Database Systems- Design, Implementation and Management 4th Edition : Rob & Coronel (Course Technology-Thomson Learning)

REFERENCE BOOKS :

- Database Management System : Vipin Desai (Galgotia Pub.)
- Modern Database Management 7th Edition : Hoffer, Prescott and McFadden, Pearson Education.
- Database Management System : Korth (McGraw Hill)
- Understanding SQL : Martin Grubber (BPB)
- SQL a Complete Reference : Alex Leon, Mathews Leon (Tata Mcgraw-Hill)

• **PRACTICALS BASED ON SQL**

• **TERMWORK SHOULD BE BASED ON THE SYLLABUS**



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BCA303 INTERNET TECHNOLOGIES AND PROGRAMMING

TEACHING		EXAMINATIONS				
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3	2	20	10	70	50	150

JAVA INTRODUCTION **(10%)**

OOP Concepts, Feature Of Java language, Types of Java programs, Java Architecture, Java Environment, Java Virtual Machine.

JAVA LANGUAGE OVERVIEW **(10%)**

Java literals, Data types and Variables, Structure of a Java Program, Command line arguments, Expression and Statements, Type Conversion, Block Statements and Scope, Operators, Control Statements.

CLASSES OBJECTS AND METHODS **(15%)**

Defining a class, Object and Method, Constructors, Instance Variable hiding, “this” in constructor, Method Overloading, Passing Objects as Parameter to Methods, Inheritance, Method Overriding, Final class, Methods and Variables, Object Destruction and Garbage Collection, Recursion, Static Method, Block and Variables, Abstract Classes, Arrays and String, Wrapper Classes, Mathematical Methods(Introduction)

PACKAGES AND INTERFACES **(10%)**

Java API packages, System Packages, Defining a Packages, The import Statement, Access Modifier, Defining an Interface, Implementing an Interface, Multiple Inheritance.

EXCEPTION HANDLING **(10%)**

Types of Exceptions, Multiple Catch Statements, Rethrowing Exceptions, Creating your own Exceptions, throws Exception, finally block, checked and Unchecked Exceptions

MULTITHREADED PROGRAMMING **(15%)**

Creating Threads, States of Thread(Thread Life Cycle), Multithreaded Programming, Thread Priorities, Thread-join() method, Controlling Threads, Synchronization(theory), Inter-Thread Communication-wait(), notify(), notifyAll() (Definition)

APPLET & GRAPHICS PROGRAMMING **(15%)**

Applet Basics, Difference between Applet and Applications, Methods of building an Applet(Applet Life Cycle), Applet Tag ,Displaying a Numerical Values, Reading a Parameters to an Applet, Running an Applet, colors in Applet, Graphics- Drawing Lines, Ovals and Circles, Arcs, Polygon,

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Polyline, line Graphs and bar charts. AWT Controls- Button and Textbox, Delegation Event Model, Events, Event- ActionEvent, Event Listener- ActionListener.

MANAGING INPUT /OUTPUT FILES IN JAVA

(15%)

I/O Streams, File Class, Byte Stream – Disk File Handling, Memory Handling, Filtered Streams, Concatenating and Buffering Files using SequenceInputStream, Random Access File, Character Stream – CharArrayReader, CharArrayWriter, FileReader and FileWriter, BufferedReader and BufferedWriter Classes, Getting the Input from the User.

TEXT BOOK :

- Programming in JAVA 2 Dr. K. Somasundaram(Jaico Pub.House)

REFERENCE BOOK :

- Programming with Java : E. Balagurusamy (TMH)
- Complete reference Java2 (4th Edition) : Schildt H. (TMH)
- Using Java2 : Weber J. L. (TMH)

- **PRACTICALS AND TERM WORK SHOULD BE BASED ON SYLLABUS**



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BCA304 MULTIMEDIA AND APPLICATIONS

TEACHING		EXAMINATIONS				
HRS PER WEEK		INTERNAL		EXTERNAL 3HRS		
THEORY	PRACT	SESSIONAL	TERM WORK	THEORY	PRACT	TOTAL
3	2	20	10	70	Viva 50	150

INTRODUCTION (10%)

What is Multimedia : Definitions, CD-ROM \ DVD \ Flash Driver and Multimedia, where to use Multimedia.

MULTIMEDIA HARDWARE \ BASIC SOFTWARE TOOLS (15%)

Hardware : Connections, Memory and Storage Devices, Input Devices, Output Devices, Communication Devices.
 Software : Text Editing and Word Processing Tools, OCR Software, Painting & Drawing Tools, 3-D Modeling & Animation Tools, Image Editing Tools, Animation, Video and Digital Movie Tools.

MULTIMEDIA TEXT (15%)

The Power Of Meaning, About Font & Faces, Using Text In Multimedia, Computer & Text, Font Editing & Designing Tools, Hyper Media & Hyper text.

MULTIMEDIA SOUND (15%)

The Power Of Sound, Multimedia System Sound, Digital Audio, Making MIDI Audio, Audio File Format, MIDI versus Digital Audio, Adding Sound To Your Multimedia Project, Space Consideration .

MULTIMEDIA IMAGE \ ANIMATION (15%)

Image : Making Still Images (source of images), Colors , Image File Format.
 Animation : Principle Of Animation , Animation By Computer .

MULTIMEDIA VIDEO (15%)

Using Video, Analog Display Standard, Digital Display Standard, Digital Video, Video Recording and Tape Format, Shooting and Editing Video.

MULTIMEDIA PROJECT (15%)

Multimedia Skill : Team
 Multimedia Authoring Tools : Making Instant Multimedia ,Type of Authoring Tools, (card –and –page based ,Icon and Object Based, Time-based).

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Designing and Producing : Designing the structure , Designing the user interface, Producing.

Project Planning And Costing : Idea Analysis, Task Planning, Prototype Development, Scheduling & Estimating..

TEXT BOOK :

- Multimedia Making It Work (4th Edition) : Tay Vaughan (TMH)
(Chapter : 1 to 11, 15, 16)

REFERENCE BOOK :

- Multimedia Magic : S. Gokul (BPB).
- Digital Multimedia : Chapman & Chapman, (Wiley India)
- **MULTIMEDIA APPLICATIONS MINOR PROJECT DOCUMENTATION SHOULD ALSO BE INCLUDED IN TERM WORK.**



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BCA305 WEBSITE DEVELOPMENT AND E-COMMERCE

TEACHING		EXAMINATIONS				
HRS PER WEEK		INTERNAL		EXTERNAL 3HRS		
THEORY	PRACT	SESSIONAL	TERM WORK	THEORY	PRACT	TOTAL
3	2	20	10	70	50	150

INTRODUCTION TO E-COMMERCE AND ITS INFRASTRUCTURE (5%)

Traditional commerce v/s electronic commerce, Internet and World Wide Web, Economic forces and e-commerce, value chains in e-commerce. Technology for e-commerce: packet switched networks, Markup languages, Web clients and servers, Internet, Intranet, Extranet and Virtual Private Network. Internet connectivity options, Internet2.

B2B STRATEGIES, WEB AUCTIONS AND PORTALS (10%)

Purchasing, logistics and support activities, Electronic data interchange, EDI on Internet, supply chain management, software for purchasing, E-markets and portals. Auction basics, web auction strategies, virtual communities.

INTERNATIONAL, LEGAL, ETHICAL AND TAX ISSUES (10%)

Issues and solutions pertaining to language, culture, infrastructure, borders and jurisdiction, Internet jurisdiction, defamation, privacy rights, Ethical issues, Income tax, sales tax etc. General overview of Indian IT Act 2000. Cyber laws of other countries

HARDWARE, SOFTWARE AND TOOLS FOR ESTABLISHING E-COMMERCE ENVIRONMENT (20%)

Web server hardware and performance evaluation, web server software feature sets-core capabilities, site management, site development; Web server software and tools- apache server, MS IIS, Netscape Enterprise server etc; Web server tools for portals; search engines, push technologies and intelligent agents.

Features of e-commerce software-catalog display, shopping cart, transaction processing, Hosting of e-commerce sites-Web hosting v/s Self hosting, other options of joining reputed sites. E-commerce software for small to large businesses- INTERSHOP Merchants, Net. Commerce Start, Site Server, Websphere, Commerce server, CRM and KMS software etc.

SECURITY AND PAYMENT ISSUES IN E-COMMERCE (15%)

Security overview, Intellectual property threats, Threats to client computers, communication channels and server, Organizations that promote computer security.

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E-Commerce security objectives, protecting intellectual property, protecting client computers, protecting e-commerce channels, ensuring transaction integrity, protecting commerce server.

The basics of online payment systems. Various electronic payment methods in vogue, cards, electronic cash, electronic wallet, stored value cards, etc. Advantages and disadvantages of each method.

E-COMMERCE WEBSITE DEVELOPMENT

(40%)

E-commerce site development using the available technologies and tools. Examples may be given for development of small sites for online stores, bookseller, music store, software stores etc with VB, ASP, SQL server/Access or other engine, HTML/XML etc. tools.

TEXTBOOK :

- Electronic Commerce, 4th Edition : Gary P Schneider, (Course Technology-Thomson Learning) (Chapters 1-2, 5-12)
- Visual Basic Developer's Guide to E-Commerce with ASP and SQL server : Noel Jerke, (BPB). (Necessary coverage for website development from Chapters 1 to 15)

REFERENCE :

- Electronic Commerce : From Vision to Fulfillment, 3rd Edition : Elias Awad, (Pearson Prentice Hall)
- E-Commerce: Concepts, Models, Strategies : CSV Murty (Himalaya Publishing)
- E-Commerce: Fundamentals and Applications : Chan, Lee, Dillon and Chang, (Wiley India)
- E-Security and You : Sundeep Oberoi (TMH)
- E-Commerce Developer's Guide : Noel Jerke, (BPB)
- Beginning E-Commerce : Mathew Renolds (Shroff Publishers)
- Designing Interactive Websites : Mohler and Duff (Thomson Learning)
- Basics of Website Design- NIIT

- **PRACTICALS AND TERM WORK SHOULD BE BASED ON SYLLABUS**
- **E-COMMERCE MINOR PROJECT DOCUMENTATION SHOULD ALSO BE INCLUDED IN TERM WORK**



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BCA 306.1 ELECTIVE–I SOFTWARE PROJECT MANAGEMENT

TEACHING		EXAMINATIONS				
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3	2	20	10	70	-	100

INTRODUCTION TO SOFTWARE PROJECTS AND PLANNING (10%)

Introduction, software projects, types, activities, project management, plans and methodologies, stakeholders, requirement specifications, management control.

Stepwise project planning, planning of scope, objectives, infrastructure, characteristics, products, activities, effort estimation, risks, resource allocation, review of plan, Execution of plan.

MANAGEMENT, EVALUATION AND APPROACH (15%)

Programme management, benefits management, evaluation of projects, cost-benefit analysis, cash flow forecasting, risk evaluation.

Selection of project approach, choosing technologies, process models-waterfall, spiral etc., prototyping, dynamic systems development method, extreme programming, managing iterative processes, selection of process model.

EFFORT ESTIMATION AND ACTIVITY PLANNING (30%)

Estimation requirements, over and under estimates, basis for estimation, estimation techniques, estimation by analogy, function point analysis, code-oriented approach, COCOMO model.

Activity planning, objectives, schedules, defining activities, sequencing and scheduling activities, network planning models- CPM and PERT, CPM network analysis, use of Microsoft Project for network analysis.

RISK MANAGEMENT (10%)

Categories of risk, dealing with risk, Risk identification, assessment, planning and management, evaluation of risk using PERT technique, Monte Carlo simulation, critical chain concepts.

RESOURCE ALLOCATION, MONITORING AND CONTROL (10%)

Nature and identification of resources, scheduling resources, costing of resources. The project control cycle, visualizing progress, Earned value analysis, change control.

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MANAGING CONTRACTS, PEOPLE AND TEAMS

(15%)

ISO standard for acquisition and supply of software, Different types of contracts, Stages in contract placement, Typical terms of a contract, Contract management.

Organizational behaviour, the recruitment process, motivation, team development, decision making, leadership, organizational structures, dispersed and virtual teams, influence of culture, stress, health and safety.

SOFTWARE QUALITY

(10%)

Defining software quality, ISO standard for software quality, quality measures, product versus process quality, enhancing software quality.

TEXT BOOK :

- Software Project Management : Hughes and Cotterell, (Tata McGraw-Hill) (All Chapters)
- Information Technology Project Management : Kathy Schwalbe, (Thomson Learning) (For reference to use Microsoft Project 2003)

REFERENCE :

- Effective Software Project Management : Robert Wysocoki (Wiley India)
- Basics of Software Project Management : NIIT (Prentice-Hall India)
- Software Project Management: A Unified Framework : Walker Royce (Pearson Education)
- Software Project Management in Practice : Pankaj Jalote (Pearson Education)
- Information Technology Project Management : Jack Marchewka (Wiley India)
- Software Project Management : A Real Guide to Success : Joel Henry (Pearson Education)
- Managing Your Projects Successfully With MS Project : Bonnie Biafore, (Prentice-Hall India)
- Project Management: A Managerial Approach : Jack Meredith and Samuel Mantel, (Wiley India)

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BCA 306.2 ELECTIVE–II ENTERPRISE RESOURCE PLANNING AND DATA WAREHOUSING

TEACHING		EXAMINATIONS				
HRS PER WEEK		INTERNAL		EXTERNAL 3HRS		
THEORY	PRACT	SESSIONAL	TERM WORK	THEORY	PRACT	TOTAL
3	2	20	10	70	-	100

ENTERPRISE RESOURCE PLANNING

(50%)

Functional areas and processes of business enterprises, Functional area information systems, Evolution of ERP, Need for integration of business/manufacturing functions, Management of multisite operations.

Survey of typical ERP packages, Functional modules of SAP R/3, Investment tradeoff in ERP,

Understanding the functional modules-Sales, Materials, Production, Quality, Plant maintenance, Asset management, Human resources, Finance, Controlling, Projects and Workflow, Case Study of a typical ERP package.

Implementation of ERP and change management.

ERP and Internet

DATA WAREHOUSING

(50%)

Data warehouse roles and structure, functions, cost of warehousing data, Data mining, Data visualization.

Data ware house architecture, metadata, Data warehouse technologies.

Data mining and visualizations, Online Analytical Processing, Software Technologies.

Executive Information Systems-history, components.

Designing and building Data ware house-Enterprise model, project plan, specification and development.

Case Study of an available OLAP tool.

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TEXT BOOK :

- Concepts in Enterprise Resource Planning : Ellen Monk and Bret Wagner (Thomson Learning) (All chapters)
- Modern Data Warehousing, Mining and Visualization : George Marakas (Pearson Education) (Chapters 1, 2, 3, 5 and 6 only)

REFERENCE BOOKS :

- Enterprise Resource Planning : Alexis Leon (Tata McGraw-Hill)
- Introduction to Building the Data Warehouse : IBM, (Prentice-Hall India)

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BCA 306.3 ELECTIVE–III DATA SECURITY

TEACHING		EXAMINATIONS				
HRS PER WEEK		INTERNAL		EXTERNAL 3HRS		
THEORY	PRACT	SESSIONAL	TERM WORK	THEORY	PRACT	TOTAL
3	2	20	10	70	-	100

INTRODUCTION TO CRYPTOGRAPHY

(35%)

Basics of cryptography, classic methods-substitution, double transposition, onetime pad, codebook cipher etc., Taxonomy of cryptography and cryptanalysis.

Symmetric Key Cryptography, stream ciphers- A5/1, RC4, Block ciphers- Feistel, DES, triple DES, AES, TEA, Block cipher modes, integrity of ciphers.

Public key cryptography, Knapsack, RSA, Diffie-Hellman, Elliptic curve cryptography, Uses of public key cryptography, Public key infrastructure.

Hash functions, The birthday problem, Non-cryptographic hash functions, Tiger hash, Uses of Hash functions.

ACCESS CONTROL

(20%)

Authentication, passwords, biometrics, password generator, Two factor authentication, Single sign-on and web cookies.

Authorization, Access control matrices, Multilevel security models, Multilateral security, Cover channel, Inference control, CAPTCHA, Firewalls, Intrusion detection.

PROTOCOLS

(20%)

Simple authentication protocols- Simple security protocols, Authentication protocols, Authentication and TCP.

Real-world security protocols- SSL, IPsec, KERBEROS, GSM.

SOFTWARE SECURITY

(25%)

Software flaws and Malware- Software Flaws, Malware, Software based attacks.

Insecurity in software- Software Reverse Engineering, Software tamper resistance, Digital Rights Management, Software development and security.

Operating Systems and Security- Security functions, Trusted OS, Next Generation Secure Computing Base.

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TEXT BOOK :

- Information Security: Principles and Practice : Mark Stamp (Wiley India)

REFERENCE :

- Security in Computing, Charles Pfleeger : Shari Pfleeger (Pearson Education)
- Security In Depth : Paul Campbell, Ben Calvert, Steven Boswell (Thomson Learning)
- Cryptography and Network Security : Atul Kahate (Tata Mcgraw-Hill)
- Computer Security Study Guide : Mike Pastore, Emmett Dulaney (Wiley India)

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BCA 306.4 ELECTIVE-IV OBJECT ORIENTED TECHNOLOGY

TEACHING		EXAMINATIONS				
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THEORY	PRACT	SESSIONAL	TERM WORK	THEORY	PRACT	TOTAL
3	2	20	10	70	-	100

STRUCTURAL MODELLING AND ANALYSIS

(15%)

Definition of object, Types of objects, Class and Instances, Modeling techniques, Examples of structural models, Structural analysis techniques, Domain modeling and analysis process.

USE CASE MODELING AND ANALYSIS

(20%)

Requirement elicitation, UC modeling techniques and examples, UC analysis techniques, UC modeling and analysis process, Tricks and tips in using UC analysis

DYNAMIC MODELING AND ANALYSIS

(20%)

Scenario modeling techniques, sequence diagrams, collaboration diagrams, Examples of scenario modeling.
 Dynamic modeling using statechart diagrams, Activity diagrams.
 Dynamic analysis techniques, Dynamic modeling and analysis process, Tricks and tips.

IMPLEMENTING UML SPECIFICATIONS

(20%)

Implementing class diagrams, persistent classes, Implementing activity diagrams, state diagrams, interaction diagrams,

VIEW ALIGNMENT TECHNIQUES

(25%)

Software development methods, limitations, Unified Modeling language, shortcomings, Current object-oriented approaches, View Alignment techniques-architecture, application techniques, Method creation and customization, Case study.

TEXT BOOK :

- Object-Oriented Technology : Tsang Lau and Leung (Tata McGraw-Hill)
 (All Chapters)

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REFERENCE :

- UML, Schaum's Outline Series : Bennet, Skelton and Lunn (McGraw-Hill)
- Teach Yourself UML : Joseph Schmuller (Pearson Education)
- Object Oriented Analysis and Design : Mike O'Docherty (Wiley India)
- The Unified Modeling Language User Guide : Grady Booch, Rumbaugh and Jacobson (Pearson Education)
- UML 2 Toolkit : Eriksson, Penker and David Fado (Wiley India)

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