

BHAVNAGAR UNIVERSITY

BHAVNAGAR

(NACC Accreditation Grade “B”)

CREDIT AND SEMESTER SYSTEM

SYLLABUS

Bachelor of Computer Application

B.C.A.

(In Force From Academic Year: 2010-2011)

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**Bachelor of Computer Application
(B.C.A.)**

Credit and semester system syllabus in force from June 2010

NAME OF THE FACULTY: COMPUTER APPLICATION

SEMESTER – 1st

S.R. NO.	PAPER NO	NAME OF THE PAPER	TOTAL MARKS EXT + INT = TOTAL	PASSING STANDARD EXT + INT* = TOTAL	TOTAL TEACHING HOURS	CREDITS
1	101	Communicative English – I	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
2	102	PC Software	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
3	103	Introduction to Programming Language –C	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
4	104	Fundamental of Computer Organization	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
5	105	Database Programming using FOXPRO	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
6	106	Discrete Mathematics and introduction to Graph theory	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
7	107	Practical based on 102, 103, 105	100	40	15 Weeks x 12 Hours = 180	12

INTERNAL	MARKS
1. Internal Test – I:	15 Marks
2. Internal Test – II:	<u>15 Marks</u>
Total Marks:	30 Marks



**Bachelor of Computer Application
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Credit and semester system syllabus in force from June 2010

NAME OF THE FACULTY: COMPUTER APPLICATION

SEMESTER – 2nd

SR. NO.	PAPER NO	NAME OF THE PAPER	TOTAL MARKS EXT + INT = TOTAL	PASSING STANDARD EXT + INT* = TOTAL	TOTAL TEACHING HOURS	CREDITS
1	201	Communicative English – II	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
2	202	DTP (Desk Top Publishing)	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
3	203	Advanced C Programming	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
4	204	Digital Computer Organization	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
5	205	DBMS and Visual Programming	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
6	206	Computer Based Statistics	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
7	207	Practical based on 202, 203, 205	100	40	15 Weeks x 12 Hours = 180	12

INTERNAL	MARKS
1. Internal Test – I:	15 Marks
2. Internal Test – II:	<u>15 Marks</u>
Total Marks:	30 Marks



**Bachelor of Computer Application
(B.C.A.)**

Credit and semester system syllabus in force from June 2010

NAME OF THE FACULTY: COMPUTER APPLICATION

SEMESTER – 3rd

SR. NO.	PAPER NO	NAME OF THE PAPER	TOTAL MARKS EXT + INT = TOTAL	PASSING STANDARD EXT + INT* = TOTAL	TOTAL TEACHING HOURS	CREDITS
1	301	Communicative English – III	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
2	302	Object Oriented Programming using C++	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
3	303	Data Structure using C	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
4	304	System Analysis and Design	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
5	305	Visual Programming using VB.NET	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
6	306	Operating System	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
7	307	Practical based on 302, 303, 305	100	40	15 Weeks x 12 Hours = 180	12

INTERNAL	MARKS
1. Internal Test – I:	15 Marks
2. Internal Test – II:	<u>15 Marks</u>
Total Marks:	30 Marks



**Bachelor of Computer Application
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Credit and semester system syllabus in force from June 2010

NAME OF THE FACULTY: COMPUTER APPLICATION

SEMESTER – 4th

SR. NO.	PAPER NO	NAME OF THE PAPER	TOTAL MARKS EXT + INT = TOTAL	PASSING STANDARD EXT + INT* = TOTAL	TOTAL TEACHING HOURS	CREDITS
1	401	Communicative English – IV	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
2	402	Java Programming	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
3	403	RDBMS	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
4	404	Object Oriented Analysis and design	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
5	405	Internet Scripting and Programming language	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
6	406	Data Communication and Networking	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
7	407	Practical based on 402,403,405	100	40	15 Weeks x 12 Hours = 180	12

INTERNAL	MARKS
1. Internal Test – I:	15 Marks
2. Internal Test – II:	<u>15 Marks</u>
Total Marks:	30 Marks



**Bachelor of Computer Application
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Credit and semester system syllabus in force from June 2010

NAME OF THE FACULTY: COMPUTER APPLICATION

SEMESTER – 5th

SR. NO.	PAPER NO	NAME OF THE PAPER	TOTAL MARKS EXT + INT = TOTAL	PASSING STANDARD EXT + INT* = TOTAL	TOTAL TEACHING HOURS	CREDITS
1	501	Multimedia and Application	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
2	502	Advanced Java Programming	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
3	503	Web Application Development using ASP.NET	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
4	504	Operation Research	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
5	505	Computer Graphics using C++	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
6	506	Advanced DBMS	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
7	507	Practical based on 502, 503, 505	100	40	15 Weeks x 12 Hours = 180	12

INTERNAL	MARKS
1. Internal Test – I:	15 Marks
2. Internal Test – II:	<u>15 Marks</u>
Total Marks:	30 Marks



**Bachelor of Computer Application
(B.C.A.)**

Credit and semester system syllabus in force from June 2010

NAME OF THE FACULTY: COMPUTER APPLICATION

SEMESTER – 6th

SR. NO.	PAPER NO	NAME OF THE PAPER	TOTAL MARKS EXT + INT = TOTAL	PASSING STANDARD EXT + INT* = TOTAL	TOTAL TEACHING HOURS	CREDITS
1	601	Data ware housing and mining	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
2	602	Mobile Application using J2ME	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
3	603	Advanced Linux Programming Using Shell	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
4	604	MIS – Management Information System	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
5	605	Cryptography and Network Security	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
6	606	Project	70 + 30 = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03
7	607	Practical based on 602,603	100	40	15 Weeks x 12 Hours = 180	12

INTERNAL	MARKS
1. Internal Test – I:	15 Marks
2. Internal Test – II:	<u>15 Marks</u>
Total Marks:	30 Marks



B.C.A.
SEMESTER – I

Paper No – 101: Business Communication

(Effective from June 2010)

Objectives:

- 1) To understand the concept, process and importance of communication.
- 2) To gain knowledge of media of communication.
- 3) To develop skills of effective communication - both written and oral.
- 4) To make students familiar with information technology.
- 5) To familiarize the students with the Short Story form in Literature

Theory Marks	: *70
Internal Marks	: *30
Total Marks	: 100

No. of Lectures: 45

Examination time: 3 hrs.

Unit 1: Introduction to Communication Types & Methods

Nos. of Lectures: 20

Meaning and Definition of Communication – Process of Communication – Forms of Communication – Objectives of Communication- Upward Communication- Downward Communication - Written - Oral – Horizontal – Vertical - Formal – Informal- Grapevine – Consensus -Merits and limitations of each type- Network of Communication – Barriers to Communication – Overcoming Barriers to Communication

Unit 2: Information Technology for Communication

Nos. of Lectures: 07

- a) Telex - Facsimile(Fax) - E-mail - Voice mail - Internet Multimedia -Teleconferencing –Audio Conferencing- Video Conferencing - SMS - Telephone Answering Machine - Advantages and limitations of these types.
- b) C.O.D.; C.W.O.; C.I.F.; F.O.B.; F.O.R.; E&O.E.; Cartage; Freight; Excise Duty; Custom Duty; V.A.T.; Proforma Invoice; Invoice; Trade Mark; Hypothecation; Ex- Warehouse; Debit note; Credit Note; Pilferage; Demurrage; Power of Attorney; Consignment; Bill of Lading; Bonded Warehouse; Certificate of Origin

Unit 3: Selected business terms:

Nos. of Lectures: 03

C.O.D.; C.W.O.; C.I.F.; F.O.B.; F.O.R.; E&O.E.; Cartage; Freight; Excise Duty; Custom Duty; V.A.T.; Proforma Invoice; Invoice; Trade Mark; Hypothecation; Ex- Warehouse; Debit note; Credit Note; Pilferage; Demurrage; Power of Attorney; Consignment; Bill of Lading; Bonded Warehouse; Certificate of Origin

Unit 4: Drafting of business letters:

Nos. of Lectures: 10

Lay –out of a business letter- Appearance of a business letter- Styles and Format of a business letter - Features of a Letter of Inquiry — Solicited letter of Inquiry – Unsolicited letter of inquiry – Replies to inquiries

Unit 5: Selected Short Stories

Nos. of Lectures: 10

1. A Cup of Tea - Katherine Mansfield
2. The Post Master - Rabindranath Tagore
3. How Much Land Does A Man Need? - Leo Tolstoy

The above three stories are selected from ‘Twelve Short Stories’, Edited by C.S. Sharma, Oxford University Press, New Delhi, Print edition 2002



Recommended Books:

- 1) Business Communication - K. K. Sinha - Galgotia Publishing Company, New Delhi.
- 2) Media and Communication Management - C. S. Rayudu - Himalaya Publishing House, Bombay.
- 3) Essentials of Business Communication - Rajendra Pal and J. S. Korlhalli - Sultan Chand & Sons, New Delhi.
- 4) Business Communication – Rai & Rai, Himaliya Publishing House, Mumbai
- 5) Business Communication – Homai Pradhan, Bhende D.S., Thakur Vijaya
- 6) Business Communication (Principles, Methods and Techniques) Nirmal Singh - Deep & Deep Publications Pvt. Ltd., New Delhi.
- 7) Business Communication - Dr. S.V. Kadvekar, Prin. Dr. C. N. Rawal and Prof. Ravindra Kothavade - Diamond Publications, Pune.
- 8) Business Correspondence and Report Writing - R. C. Sharma, Krishna Mohan - Tata McGraw-Hill Publishing Company Limited, New Delhi.
- 9) Business Communication and Organisational Management – Rohini Aggrawal – Taxman
- 10) Business Communication Strategies – Monipally Mathukutty M.- Tata McGraw –Hill Publishing Company Limited, New Delhi.
- 11) Handbook of Communication – Narula Uma
- 12) A Handbook of Commercial Correspondence – A . Ashley – Oxford University Press
- 13) Business Communication and Organisational and Management – C.B.Gupta
- 14) Comprehensive Business Communication – Saroj Karnik, P.P.Mehta,- P.V.Kulkarni

Notes:

Business Communication – Semester - I
(w.e.f. June 2010)

General Rules and Instructions:

1. Business Communication for commerce students is a Compulsory subject in three years B.C.A. course divided into 6 semesters.
2. The contact hours for each semester shall be 45 Hours / semester including Admission test, internal tests, presentations, direct teaching and practical.
3. In each semester, there will be one paper of Business Communication comprising of 5 units to be studied.
4. Each question paper will be of 100 marks, out of which 70 marks are for external term end exam and 30 for internal / continuous evaluation.
5. ****The 30 marks for internal / continuous evaluation shall be bifurcated as below:***
 - a. 10 Marks for Test.
 - b. 10 marks for assignment submission.
 - c. 10 marks for presentation
6. **** The 70 marks theory paper for external examination comprises of the following :***
 - a. Each Unit comprises of 14 marks and can be further bifurcated in Long Questions and short notes of 7 mark each.
 - b. Internal options are permissible.
 - c. Questions based on theory of various forms of business letters are not to be asked in external examination.

The rules for admission and passing are as per the guidelines of Bhavnagar.



B.C.A.
SEMESTER – I

Paper No: 102: PC Software

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction 1.1 Introduction to personal computers. Characteristics of computer, types of computer 1.2 Overview of Basic Operation System, Introduction of Dos and Windows operating system Introduction to editors, 1.3 DOS – Internal and External Commands 1.4 Windows Environment – Desk top, file, folders, icons, Window explorer, control panel, Windows Accessories 1.5 Editors – Edit, Note pad, Word pad.	09	14
Unit 2	Word Processing 2.1 Introduction to word processing, Examples of some popular WP packages. 2.2 Uses of word processors, Word Processor – Examples – Uses of WP, Creation, editing, formatting of Documents. Global Search & Replacement of text. 2.3 Special printing features. 2.4 Mail merge Facilities 2.5 Spelling checker, Table facility, Templates, advanced features. 2.6 Inserting Pictures, Drawing and Equation, Macros.	09	14
Unit 3	Spreadsheet-I 3.1 Introduction to Spreadsheet 3.2 Examples of some popular Spreadsheet packages. 3.3 User of spreadsheet packages. 3.4 Building Spreadsheet using formulas, conditional calculations, and built-in functions. 3.5 Use of Conditional Formatting through formula or in-built function 3.6 Writing macros and spreadsheet menus to build a user-interface	09	14
Unit 4	Spreadsheet –II 4.1 Graph-plotting facilities. 4.2 Using externally created data lies in the spreadsheet packages. 4.3 What-if analysis, protection facility, Pivot Tables, Operation on tables. 4.4 Macros with its all options (Creating, running and Saving in the worksheet(s) with Data with spreadsheets 4.5 Application of Spreadsheets	09	14
Unit 5	Presentation Tools 5.1 Prepare the presentation, Formatting Slides. 5.2 Slide transition & adding special effects 5.3 Inserting Pictures, Sound and Chart. 5.4 Slide Design 5.5 Animation in Slide	09	14



Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Office-2007- BPB Publication
2. Office-2007 Bible: John Walenbach, Herb Tyson
3. Teach yourself Visually MS office 2007 – sherry kinkoph



Paper No: 103: Introduction to Programming Language

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Programming Language Fundamentals 1.1 Flowchart and Algorithm 1.2 Introduction to programming language and types of programming language 1.3 Concept of Editor, Compiler, Interpreter, Translator, Assembler 1.4 Getting started with C:History, Structure of C program, Compilations & linking C program 1.5 Character Set, Tokens, Identifier, Data Type, Variable and Constant	09	14
Unit 2	Programming Constructs 2.1 Formatted Input and output statements 2.2 Operators 2.3 Decision making and Branching (If, if-else, switch etc) 2.4 Looping construct (While loop, Do..While loop, For loop etc) 2.5 Break, Continue, go to and exit	09	14
Unit 3	Array and string handling 3.1 Introduction of array, 3.2 1-D,2-D,3-D Array Declaration and initialization 3.3 1-D,2-D,3-D Array Programming 3.4 Sorting Methods (Bubble sort and Selection sort) 3.5 Searching Methods (linear search)	09	14
Unit 4	Character, String Handling and Built-in Function 4.1 Declaration and initialization of string and character data 4.2 Creating variable and accessing data members 4.3 Character and string operation 4.4 Character and String handling Function 4.5 Built-in Function: math's, input output function etc	09	14
Unit 5	Structure and Union 5.1 Structure Declaration and initialization 5.2 Creating variable and accessing data members 5.3 Array within structure and array of structure 5.4 Structure within structure 5.5 Union	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

- 1) Programming in ANSI 'C' – Balaguruswamy: TMH.
- 2) Let Us C By Yasvant Kanitkar



Paper No: 104: Fundamental of Computer Organization

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction 1.1 Block Diagram Of Computer, components, Computer generations. 1.2 Input Devices: Key board, Mouse, Touch screen, Scanner, Light pen 1.3 Output Devices: CRT, LCD, And Plasma, Printers: Impact, Non Impact 1.4 Storage Devices: Magnetic Disk, CDs, DVD, Blu-Ray Disc. 1.5 Introduction to virus and Anti virus.	09	14
Unit 2	Data representation 2.1 Representation of Number, Binary, Octal, Hexadecimal number and its arithmetic. 2.2 Representation of Integers, Representation of Fractions, Representation of Character, Characters codes (ASCII, EBCDIC, UNICODE) 2.3 Binary Multiplication Division using long-hand method. 2.4 Conversation of number in Decimal, Binary, Octal, Hexadecimal. 2.5 Error Detection & Correction Code	09	14
Unit 3	Computer Memory and Buses 3.1 Introduction to Computer Memory 3.2 RAM, ROM, Types of RAM and ROM 3.3 Memory Hierarchical structure 3.4 Cache Memory and Virtual Memory 3.5 Introduction to buses, Types of buses	09	14
Unit 4	Processors 4.1 Instruction Execution and Parallel Instruction Execution. 4.2 CPU organization. 4.3 RISC versus CISC 4.4 Instruction Level Parallelism 4.5 Processor Level Parallelism	09	14
Unit 5	Instructions and Flow of Control 5.1 Instruction formats 5.2 Types of Instruction 5.3 Types of operand 5.4 Addressing modes & Their Importance 5.5 Flow of Control	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Tanenbaum A. S.: Structured Computer Organization, Prentice-Hall of India Pvt. Ltd.
2. V. RajaRaman: Fundamentals of Computers
3. Alexis Leon, Mathews Leon: Information Technology



Paper No: 105: Database Programming using FoxPro

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction 1.1 Basic concept. 1.2 File processing concepts. 1.3 Achievements of database management system. 1.4 Aims of database technology: data independence, data sharing, data integrity, database life cycle, data dictionary 1.5 Advantages of DBMS and normalization concepts	09	14
Unit 2	Database Management System (FoxPro) 2.1 Creation of database file 2.2 Listing contents database file 2.3 Editing, Replacing & Deleting data 2.4 Modifying structure of database file 2.5 Indexing, sorting & Searching	09	14
Unit 3	Basic Programming 3.1 Creation & Execution of command files 3.2 Modifying structure of database file 3.3 Declaring memory variable 3.4 Basic Operators 3.5 Programming Construct condition	09	14
Unit 4	Advance Programming & Built in Functions 4.1 Looping concept 4.2 Mathematical, Statistical, date & time functions. 4.3 Character functions, database functions 4.4 Looping program 4.5 Data base programming	09	14
Unit 5	Advanced Features 5.1 Setting environment variable 5.2 Printing reports 5.3 Handling multiple databases & linking database file. 5.4 Menu based programming	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
 2. Internal Test – II: 15 Marks
 3. Best of Two Internal Tests will be considered as internal mark
- Total Marks: 30 Marks**

Reference / Text-Books / Additional Reading:

1. R. K. Taxali: Programming in Foxpro 2.5 BPB Publication.
2. Desai Bipin C: Introduction to database Systems, West Publishing Co.
3. Foxpro 2.5/2.6 Made simple for Dos & Windows- R.K.TAXALI (BPB)



Paper No: 106: Mathematics

Marks: **100**

Credits: 03

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Sets and Functions 1.1 Introduction to set theory, Methods of representation of a set. 1.2 Operations on Set, Algebra of Sets. 1.3 Demorgan’s Law and examples. 1.4 Function Definition, Domain, Range, One-to-One function, onto function. 1.5 Composite function and Inverse of a function.	09	14
Unit 2	Vectors & Matrices 2.1 Definition of Vector, Addition and Subtraction of Vectors 2.2 Magnitude of a Vector, Unit Vectors, Dot Product and Cross Product. 2.3 Matrices: Definition of a Matrix, Equal matrices, Diagonal element of a matrix, Row matrix, Column Matrix, Symmetric Matrix, Skew-Symmetric Matrix, Orthogonal Matrix, Diagonal Matrix, Identity Matrix. 2.4 Operation on a Matrix (Addition, Subtraction and Multiplication) 2.5 Inverse of a Matrix, Rank of a Matrix, Solution of Linear Equations using Matrices	09	14
Unit 3	Permutation, Combination & Algorithms 3.1 Meaning of permutation, Formula of permutation, Permutation of n-different things, Permutation of similar things, Permutation of repeated things, Circular Permutation 3.2 Combination: Meaning of Combination, Formula of Combination. 3.3 Algorithm: Set Operations. Vector Addition, Subtraction and Dot Product. 3.4 Algorithm: Matrix Addition, Matrix Multiplication. 3.5 Algorithm: Permutation & Combination.	09	14
Unit 4	Graph Theory-1 4.1 Introduction to Graph, Graph Definition, Vertices, Edges, Loops, Parallel Edges, Simple Graph, Finite Graph, Adjacent vertices, Incidence between vertex and edge, Degree of a vertex, Isolated Vertex, Pendent Vertex, Null Graph. 4.2 Isomorphism, Labeled Graph, Unlabeled Graph. 4.3 Walk, Closed Walk, Open Walk, Simple Path, Circuit, Connected Graph, Euler Line, Euler Graph. 4.4 Operation on Graph (Union, Intersection and Complement), Fusion. 4.5 Only Concepts and Simplex Examples are included. Theorems are not included.	09	14
Unit 5	Graph Theory – 2 5.1 Hamiltonian Graph, Hamiltonian Cycle, Cut set. 5.2 Tree Definition, Rooted Tree, Binary tree and its properties, Uses of Binary Tree. Level of a tree. 5.3 Spanning Tree, Distance, Eccentricity and Center of a Tree. 5.4 Matrix Representation of a Tree (Incidence Matrix and Adjacency Matrix). 5.5 Applications of a Graph, Konisberg Bridge Problem, House Utility Problem, Four Colour Problem, Traveling Salesman Problem. (Only Concepts and Simplex Examples are included. Theorems are not included.	09	14



Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. D. C. Sancheti, V. K. Kapoor: Business Mathematics, Sultan Chand & sons.
2. Lipschutz & Marc Lipson: DISCRETE MATHEMATICS, Tata Mcgraw Hill
3. Gupta & Gupta: Business Statistics, Sultan Chand & sons.
4. Narsingh Deo: Graph Theory with application to engineering and computer science, Prentice Hall of India Pvt. Ltd



Paper No: 107: Pratical

Marks: 100

Credits: 12

Practical based on Paper No.	Practical Hours (Total 180 Hours)	Marks/ Weight
Paper No – 102	40	30
Paper No – 103	70	35
Paper No – 105	70	35



B.C.A..
SEMESTER – II

Paper No – 201: Business Communication

(Effective from Dec. 2010)

Objectives:

- 1) *To understand the concept, process and importance of communication.*
- 2) *To gain knowledge of media of communication.*
- 3) *To develop skills of effective communication - both written and oral.*
- 4) *To make students familiar with information technology.*
- 5) *To familiarize the students with the Short Story form in Literature.*

<i>Theory Marks</i>	<i>: 70*</i>
<i>Internal Marks</i>	<i>: 30 *</i>
<i>Total Marks</i>	<i>: 100</i>

No. of Lectures: 45

Examination time: 3 hrs.

Unit 1: Types and Methods of Communication

Nos. of Lectures: 12

Upward Communication- Downward Communication - Written - Oral – Horizontal – Vertical - Formal – Informal- Grapevine – Consensus -Merits and limitations of each type- Network of Communication – Barriers to Communication – Overcoming Barriers to Communication

Unit 2: Letter of Orders & Cancellation of Orders

Nos. of Lectures: 08

*Features of an Order Letter- Drafting of Order Letter- Acknowledgement of an Order Letter- Executing Orders (Fully/partially) – Demanding Extension of time
Substitute Offers; Firm Offers; Cancellation of Orders*

Unit 3: Complaints and Adjustments

Nos. of Lectures: 08

*Letters of Complaints – Drafting an Effective Letter of Complaint – Attitude to Complaints – Replies to Complaints – Adjustment Policies – Characteristics of
A Well Drafted Adjustment Letter.*

Unit 4: Application Writing & Cover letters for Jobs

Nos. of Lectures: 07

Features of an Application Letter – Solicited Application Letters – Unsolicited Application Letters – Resume and C.V. Formats -

Unit 5: Selected Short Stories

Nos. of Lectures: 10

- | | |
|--------------------------|--------------------|
| 1. A True Story | - Mark Twain |
| 2. Blow Up With The Ship | - Wilkie Collins |
| 3. The Mother | - Somerset Maugham |

The above three stories are selected from ‘Twelve Short Stories’, Edited by C.S.Sharma, Oxford University Press, New Delhi, Print edition 2002



Recommended Books:

- 1) *Business Communication - K. K. Sinha - Galgotia Publishing Company, New Delhi.*
- 2) *Media and Communication Management - C. S. Rayudu - Himalaya Publishing House, Bombay.*
- 3) *Essentials of Business Communication - Rajendra Pal and J. S. Korlhalli - Sultan Chand & Sons, New Delhi.*
- 4) *Business Communication – Rai & Rai, Himaliya Publishing House, Mumbai*
- 5) *Business Communication – Homai Pradhan, Bhende D.S., Thakur Vijaya*
- 6) *Business Communication (Principles, Methods and Techniques) Nirmal Singh - Deep & Deep Publications Pvt. Ltd., New Delhi.*
- 7) *Business Communication - Dr. S.V. Kadvekar, Prin. Dr. C. N. Rawal and Prof. Ravindra Kothavade - Diamond Publications, Pune.*
- 8) *Business Correspondence and Report Writing - R. C. Sharma, Krishna Mohan - Tata McGraw- Hill Publishing Company Limited, New Delhi.*
- 9) *Business Communication and Organisational Management – Rohini Aggrawal – Taxman*
- 10) *Business Communication Strategies – Monipally Mathukutty M.- Tata McGraw –Hill Publishing Company Limited, New Delhi.*
- 11) *Handbook of Communication – Narula Uma*
- 12) *A Handbook of Commercial Correspondence – A . Ashley – Oxford University Press*
- 13) *Business Communication and Organizational and Management – C.B.Gupta*
- 14) *Comprehensive Business Communication – Saroj Karnik, P.P.Mehta,- P.V.Kulkarni*

Notes:

Business Communication – Semester - II
(w.e.f. Dec. 2010)

General Rules and Instructions:

1. Business Communication for commerce students is a Compulsory subject in three years B.C.A. course divided into 6 semesters.
2. The contact hours for each semester shall be 90 Hours / semester including Admission test, internal tests, presentations, direct teaching and practical.
3. In each semester, there will be one paper of Business Communication comprising of 5 units to be studied.
4. Each question paper will be of 100 marks, out of which 70 marks are for external term end exam and 30 for internal / continuous evaluation.
5. ***The 30 marks for internal / continuous evaluation shall be bifurcated as below:**
 - a. 10 Marks for Seminar.
 - b. 10 marks for assignment submission.
 - c. 10 marks for presentation
6. *** The 70 marks theory paper for external examination comprises of the following :**
 - a. Each Unit comprises of 14 marks and can be further bifurcated in Long Questions and short notes of 7 mark each.
 - b. Internal options are permissible.
 - c. Questions based on theory of various forms of business letters are not to be asked in external examination.

The rules for admission and passing are as per the guidelines of Bhavnagar



Paper No: 202: Desktop Publishing

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction to DTP 1.1 What is DTP? 1.2 Various Applications of DTP. 1.3 Introduction to various DTP packages, Features of DTP packages 1.4 Comparison between word processing packages and DTP packages 1.5 Advantages and disadvantages of DTP packages	09	14
Unit 2	Page maker7:Part-I 2.1 Navigating in PageMaker ♣ PageMaker Environment Elements 2.2 Navigating in PageMaker ♣ Navigating a PageMaker Document 2.3 Creating a Document 2.4 Multi-Page Documents setup 2.5 Master Pages, Inserting Pages and Working with Text	09	14
Unit 3	Page maker7:Part-II 3.1 Working with Frames ♣ Creating Text Frames 3.2 Formatting Text: Character Formatting 3.3 Formatting Text: Paragraph Formatting 1. Working with Indents, Tabs, and Rules 3.4 Graphics: Working with Text and Graphics 2. Attaching Text to a Frame 3.5 Introduction to Menu	09	14
Unit 4	Adobe photoshop CS3: Part-I 4.1 Photoshop's Environment 3. Raster and Vector Graphics, Photoshop Environment Elements, Navigating in Photoshop 4.2 Sizing Images 4. Image Size and Resolution, Cropping 4.3 Selecting Image Areas 5. The Rectangular and Elliptical Marquee Tools, The Lasso Tools Saving Selections, The Magic Wand Tool, The Magnetic Lasso Tool, Modifying Selections 4.4 Layers 6. Floating Versus Fixed Selections, Undoing Previous Steps Copying Selections, Creating Layers, Transforming Layers Copying Layers between Images, Arranging Layers, Saving Images in Photoshop Format 4.5 Blending and Compositing Defringing, Opacity and Blending Modes, Feathering Edges	09	14



Unit 5	Adobe photoshop CS3: Part-II 5.1 Image Modes 7. Mode Characteristics, Grayscale and Bitmap Modes, Color Modes 5.2 Text, Layer Effects, and Filters-I 8. Type Layers, Layer Effects 5.3 Text, Layer Effects, and Filters-II 9. Filters, Merging and Flattening Layers 5.4 Color and Painting, Selecting Colors, Painting Tools, The Clone, Stamp Tool 5.5 Adjusting Images 10. Brightness/Contrast, Levels Adjustment Layers, Toning Tools, Hue/Saturation	09	14
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Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

Desktop Publishing by Computer world



Paper No: 203: Advanced C Programming:

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction to Pointers 1.1 Declaration, initialization and arithmetic of pointers 1.2 Pointer to array and structures 1.3 Pointers and character strings 1.4 Pointers as function arguments 1.5 Pointers to functions and functions returning pointers	09	14
Unit 2	Functions 2.1 Concept of modular programming (Top-Down and Bottom-Up Approach) 2.2 Elements of function 2.3 Type of Function 2.4 Passing Array, structure, string and union as function argument 2.5 Scope of Variable, Storage class specifier and Recursive function	09	14
Unit 3	File management 3.1 Introduction 3.2 Defining, opening and closing a file 3.3 I/O operations on files and error handling 3.4 Random access to files 3.5 Command line arguments	09	14
Unit 4	Dynamic memory allocation and introduction to linked list 4.1 Introduction to dynamic memory allocation 4.2 Introduction and advantages of linked list and types of linked list 4.3 Creation of single linked list 4.4 Single circular linked list 4.5 Various operations on single linked list	09	14
Unit 5	Double Linked list 5.1 Introduction and advantages of double linked list 5.2 Creation of double linked list 5.3 Various operations on double linked list 5.4 Double circular linked list 5.5 Applications of linked list	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Programming In ANSI C By E. Balagurusamy, TMH Publication.
2. Introduction to Data Structure with Applications By Tremblay & Sorenson, TMH Publication
3. Understanding Pointers in C By Yashwant Kanitkar, BPB Publication
4. Programming with C, Schaums Series, TMH Publication.



Paper No: 204: Digital Computer Organization

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Gates and Boolean Algebra 1.1 Introduction to Gates and Invertors 1.2 Boolean Algebra and truth tables 1.3 Preparing truth table for given circuit 1.4 Preparing circuit for given truth table (SOP & POS) 1.5 De Morgan's Theorems	09	14
Unit 2	Basic Digital Logic Circuits 2.1 Integrated circuits. 2.2 Encoder, Decoder 2.3 Multiplexers 2.4 Demultiplexer 2.5 Comparators.	09	14
Unit 3	Arithmetic Circuits 3.1 Shifters 3.2 Adders 3.3 Subtractors 3.4 Half adder, Full adder 3.5 Binary adder, binary adder/ subtractor	09	14
Unit 4	Memory Units 4.1 Latches(RS, D, Level Clocking) 4.2 Flip-Flops(D,JK) 4.3 Registers(Shift, Buffer, Controlled) 4.4 Counters(Ripple, Synchoneous) 4.5 Introduction to memory chips	09	14
Unit 5	CPU chips and Buses 5.1 CPU Chips 5.2 Examples of CPU Chips(P-I.P-II,P-III etc.) 5.3 Computer Buses 5.4 Bus Width, Arbitration, Clocking, Operations 5.5 Example Buses(ISA,PCI,USB)	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Tanenbaum A. S.: Structured Computer Organization, Prentice-Hall of India Pvt. Ltd.
2. Malvino A. P.: Digital Computer Electronics, Tata McGraw, Hill Pub. Co. Ltd.
3. Thomas Bartee: Computer Architecture & Logic Design, Tata McGraw, Hill Pub. Co. Ltd.
4. Pal Chaudhuri: Computer Organization and Design, Prentice-Hall of India Pvt. Ltd.
5. IBM PC and Clones by Govindrjalu, TMH Publication.



Paper No: 205: DBMS Using MS-Access and Visual Programming

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Visual Basic Overview and Introduction 1.1 Introduction to integrated development environment 1.2 Introduction to application wizard. 1.3 Introduction to Method & Events 1.4 Designing Components and programming constructs 1.5 Active X and Advance Active X Controls	09	14
Unit 2	MDI Environment 2.1 Introduction to MDI Form. 2.2 MDI built in capabilities 2.3 Array of Forms and Coordinating data between MDI child Forms. 2.4 Toolbar and Menubar 2.5 Modules	09	14
Unit 3	Introduction to Access 3.1 Creating databases, tables, Query (Select, Update, Insert, Delete). 3.2 Defining relationship among tables 3.3 Exchanging data with outside Sources (From Word Processor, Spread Sheet) 3.4 Saving Access output as an External File. 3.5 Exchanging data with Word and Excel.	09	14
Unit 4	Database Connectivity Concepts 4.1 Client server programming concepts 4.2 Connectivity Using Data binding controls(ADODC) 4.3 Connectivity without using bound controls(ADODB) 4.4 Database programming using SQL. 4.5 Generate Simple Data Report.	09	14
Unit 5	Error Handling & Visual Basic with Internet 5.1 How to handle errors in project. 5.2 Error handling methods: On error go ton Label, On error go to line#, On error resume next. 5.3 Getting en error using error code & error description. 5.4 Creating a web browser. 5.5 Working with Email using MAPI Controls: Sending email, reading email.	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. The Complete Reference Microsoft Office Access 2007, By Virginia Anderson, TMH Publication.
2. Visual Basic 6 Programming Black Book By Steven Holzner, Dreamtech Publication, IDG Books India



Paper No: 206: Computer Oriented Statistical Methods

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Measure of Central Tendency 1.1 Definition, Ungrouped Data, Grouped Data (Discrete and Continuous Grouped data) 1.2 Mean: Arithmetic Mean, Geometric Mean and Harmonic Mean for ungrouped data. Combined Mean and Weighted Mean. 1.3 Median and Mode. 1.4 Quartiles, Deciles and Percentiles 1.5 Algorithm/C-Program related to the above methods.	09	14
Unit 2	Measure of Dispersion 2.1 Definition, Different measure of dispersion. 2.2 Quartile Deviation 2.3 Mean Deviation, Standard Deviation, Combined Standard Deviation. 2.4 Coefficient of Variation, Measure of Skewness (Karl Pearson’s method and Bowley’s method) 2.5 Algorithm/C-Program related to the above methods.	09	14
Unit 3	Correlation and Regression 3.1 Correlation:-Definition, Types of Correlation (positive and negative correlation), Correlation Coefficient. 3.2 Karl Pearson’s Method 3.3 Spearman Rank correlation coefficient method. 3.4 Regression: Linear regression, regression line of y on x and regression line of x on y. 3.5 Algorithm/C-program of Correlation coefficient and Regression.	09	14
Unit 4	Time Series Analysis and Curve Fitting 4.1 Definition of Time Series, Components of Time Series. 4.2 Method of measuring trend: Moving Average Method. 4.3 Method of Least Square. 4.4 Curve Fitting: Straight Line, Second Degree parabola, Cubic Equations 4.5 Only Examples. Derivations of equations are not included.	09	14
Unit 5	Probability & Probability Distribution 5.1 Probability:-Random Experiment, Sample Space, Event, Mutually exclusive event, Exhaustive event, Equally likely event and probability Classical definition. 5.2 Probability Distribution (Discrete and Continuous). 5.3 Discrete Probability Distribution: Binomial Distribution, Poisson Distribution 5.4 Continuous Probability Distribution: Normal Distribution 5.5 Simple Examples of Probability.	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Gupta & Gupta: Business Statistics, Sultan Chand & sons



Paper No: 207: Practical

Marks: **100**

Credits: **12**

Practical based on Paper No.	Practical Hours (Total 180 Hours)	Marks/ Weight
Paper No – 202	40	30
Paper No – 203	70	35
Paper No – 205	70	35



B.C.A.
SEMESTER – III

Paper No: 302: Object Oriented Programming with C++

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Fundamentals of Programming 1.1 Introduction: POP and OOP 1.2 Characteristics of POP and OOP 1.3 Advantages of OOP 1.4 Data Types, Variables, Constants, Expression, Statements and operators 1.5 Structure and Function in C++	09	14
Unit 2	OOP Overview 2.1 OOP Concept 2.2 Declaration and creation of Classes and Objects 2.3 Input output statements 2.4 Function (Member function, Friend Function, Inline function) 2.5 Constructor and destructor	09	14
Unit 3	Operator Overloading And Type Conversion 3.1 Operator overloading Concept 3.2 Unary and Binary Operator Overloading 3.3 Operator overloading using member function and friend function 3.4 Introduction of type conversion 3.5 Categories of type conversion	09	14
Unit 4	Inheritance & polymorphism 4.1 Inheritance 4.2 Types of inheritance 4.3 *this pointer 4.4 Polymorphism (Compile time and Run time polymorphism) 4.5 Pure virtual function	09	14
Unit 5	File Handling and exception handling 5.1 Concepts Stream class and its function 5.2 File stream class structure and operation 5.3 Sequential and random access file 5.4 Command line arguments 5.5 Exception handling	09	14



Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. E.Balaguruswami: Object Oriented Programming with C++ Mc Graw-Hill
2. Robert Lafore: Object Oriented Programming with C++ Gagotia Pub.
3. Rajaraman: Object Oriented Programming with C++ New age International



Paper No: 303: Data and File Structure

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction of Data Structure Concept 1.1 Definition, Type of Data structure 1.2 Logical and Control structure 1.3 Time and space efficiency of algorithm 1.4 Application of data structure 1.5 Representation and Sparse Matrices	09	14
Unit 2	Pointer and File handling 2.1 Deceleration, initialization and arithmetic of pointers 2.2 Pointer to array and structure 2.3 Pointer as function argument and function pointer 2.4 File based operation Reading and Writing 2.5 Sequential and Random Access	09	14
Unit 3	Sorting and Searching Method 3.1 Bubble, and Selection sort 3.2 Shell, Quick and insertion sort. 3.3 Sequential Search 3.4 Binary Search 3.5 Merging Techniques	09	14
Unit 4	Linear Data Structure 4.1 Single linked list: Insert, Delete, Edit, Searching, sorting, Circular 4.2 Double linked list: Insert, Delete, Edit, Searching, sorting, Circular 4.3 Stack: Push, Pop and PEEP 4.4 Queue and Circular Queue: insert, Delete 4.5 Application of linked list, stack and queue	09	14
Unit 5	Non Linear Structure 5.1 Introduction of Trees and graph. 5.2 Binary Tree operation: Create, Delete and Searching. 5.3 Tree Traversal Algorithms (Iterative and recursive). 5.4 Storage structure for graphs. 5.5 Simple algorithm on graphs.	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
 2. Internal Test – II: 15 Marks
 3. Best of Two Internal Tests will be considered as internal mark
- Total Marks: 30 Marks**

Reference / Text-Books / Additional Reading:

1. Bhagat Singh and Thomas Naps: Introduction to Data Structure Data McGraw- Hill publishing Co. Ltd.
2. Tremblay J and Sorenson P.G.: An Introduction to Data Structure with application 2nd Edition McGraw- Hill International Edition.
3. Introduction to Data Structure: Schaum Series Publications
4. Programming in Ansi C – E-Balaguruswami – TMH
5. Understandig Pointer in C – Yashvant P. Kanitkar



Paper No: 304: System Analysis and Design

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	System Concepts 1.1 Introduction to System, Characteristics & Elements of system. 1.2 Major System concepts and Types of System. 1.3 System Analysis, Role of System Analyst and users 1.4 Information & Information System. 1.5 Role of Business Information System in Organization.	09	14
Unit 2	System Development Life Cycle (SDLC) 2.1 Requirement analysis and Determination 2.2 System Design Technique 2.3 System Development 2.4 System Testing 2.5 System Implementation and Evaluation	09	14
Unit 3	Structured System Analysis and Design Method 3.1 Need of Structured Analysis and Design 3.2 System survey, 3.3 Structured analysis, 3.4 Structured design 3.5 Advantage of SSADM.	09	14
Unit 4	Input / Output Design, Fact Gathering Techniques Testing and implementation 4.1 Input - Data capture objectives, Data verification and validation, Interactive screen design. 4.2 Output - Design principles of output, Output objectives, 4.3 Fact Gathering Techniques–Interviewing, Questionnaires, Record inspection, Observations. 4.4 Testing Techniques 4.5 Implementation Method	09	14
Unit 5	Analysis and Design Tools 5.1 DFD: Logical and Physical DFD 5.2 Decision tables 5.3 Decision Tree 5.4 Data Dictionary 5.5 HIPO chart and Structured English	09	14

Break up of Continuous Internal Evaluation:

- Internal Test – I: 15 Marks
- Internal Test – II: 15 Marks
- Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

- James A. Senn: Analysis & Design of Information System 2nd Edition McGraw-Hill International Edition.
- S. Parthasarthy & B. W. Khalkar: System Analysis & Design 1st Edition, Master Ed. Cons.
- Yourdon E. and Constantine L. L: Structured Analysis & Design Yourdon press NY.



Paper No: 305: Visual Programming Using .Net

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction 1.1 The .NET framework & Common Language Runtime 1.2 .Net Assembly 1.3 Visual Basic Language – Operators, Conditions & Loops 1.4 Procedures & Functions, Understanding Scope, Exception handling 1.5 Console application development	09	14
Unit 2	Getting Started with VB .NET 2.1 Concept of event handling 2.2 Creating forms in application 2.3 Basic Controls– Text Boxes, Rich Text Boxes, Labels & Link Labels etc 2.4 Other common controls – Buttons, Check Boxes, Radio Buttons, List Boxes, 2.5 Combo Boxes, Scrollbars & Timers etc.	09	14
Unit 3	Advance .Net Controls 3.1 Picture box, Month and Calendar 3.2 Built in Dialog box 3.3 Track bar, Splitter 3.4 Notify Icon, Tools Tip, Menu etc 3.5 Progress Bar	09	14
Unit 4	Object Oriented Programming 4.1 Classes & Objects 4.2 Fields, Properties, Methods & Events 4.3 Abstraction, Encapsulation, Inheritance & Polymorphism 4.4 Overloading, Overriding & shadowing 4.5 Constructors & Destructors	09	14
Unit 5	Database Access with ADO .NET 5.1 Accessing data with Server Explorer 5.2 Accessing data with Data Adaptors & Datasets 5.3 Working with ADO .NET and Database Binding Controls 5.4 Concept of Dataset, Data Tables and Database programming using code. 5.5 Report Generation using crystal report.	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Steven Holzner: Visual Basic .NET Programming Black Book DeramTech Press.
2. ROD STEPHENS: VISUAL BASIC 2005 PROGRAMMER'S REFERENCE KOAGENT SOLUTIONS INC.: VISUAL BASIC 2005 WITH .NET 3.0 FRAMEWORK IN SIMPLE STEPS



Paper No: 306: Operating System

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction to operating systems 1.1 Definition and Function of operating systems. 1.2 Evolution of operating system. 1.3 Introduction to basic terms & batch processing system: Jobs, Processes files, command interpreter. 1.4 Different types of operating system-real time systems, multi-user System, distributed system. 1.5 Operating system structure-monolithic layered, virtual machine & Client server.	09	14
Unit 2	Memory Management 2.1 Logical & Physical address, protection, paging, segmentation. 2.2 Virtual memory. 2.3 Page replacement algorithms. 2.4 Cache memory, hierarchy of memory types. 2.5 Associative memory.	09	14
Unit 3	Process Scheduling 3.1 Process states, virtual processor. 3.2 Interrupt mechanism. 3.3 Scheduling algorithms 3.4 Performance evaluation of scheduling algorithm 3.5 Threads	09	14
Unit 4	File and I/O Management 4.1 I/O Hardware, I/O Drivers 4.2 DMA controlled I/O & programmed I/O 4.3 I/O Supervisors. 4.4 File systems-Partitions & Directory structure 4.5 Disk space allocation, Disk scheduling	09	14
Unit 5	Distributed Operating system 5.1 Introduction and need for distributed OS 5.2 Architecture of Distributed OS 5.3 Models of distributed system 5.4 Remote procedure Calls 5.5 Distributed shared memory	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
 2. Internal Test – II: 15 Marks
 3. Best of Two Internal Tests will be considered as internal mark
- Total Marks: 30 Marks**

Reference / Text-Books / Additional Reading:

1. Peterson J and Silberchez A: Operating System Concepts Wesley.
2. Batch J: The design of Unix OS, PHI
3. Book-Unofficial Guide to ethical hacking-By Ankit Fadia-MacMillan, ISBN



Paper No: 307: Practical

Marks: 100

Credits: 12

Practical based on Paper No.	Practical Hours (Total 180 Hours)	Marks/ Weight
Paper No – 302	40	30
Paper No – 303	70	35
Paper No – 305	70	35



B.C.A.
SEMESTER – IV

Paper No: 402: JAVA Programming

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**
 Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Basics of JAVA 1.1 Basic concept of OOP Approach-Class and object, Abstraction and Encapsulation, Inheritance and Polymorphism 1.2 Benefit and application of OOP 1.3 Java Language Basics- Byte code, Buzz Words 1.4 Data types, Operators 1.5 Control Statement, Array, and command line argument	09	14
Unit 2	Object - Oriented programming and Exceptions Handling 2.1 Class and Objects, Methods 2.2 Polymorphism- Method Overloading 2.3 Constructor, Garbage Collection, Inheritance 2.4 Packages and Interfaces 2.5 Exception Handling	09	14
Unit 3	Multithreading 3.1 Introduction 3.2 The Main Thread 3.3 Java Thread Model 3.4 Thread priority 3.5 Inter thread communication	09	14
Unit 4	I/O in JAVA, Strings and Characters 4.1 I/O Basics 4.2 Reading and Writing Files 4.3 Fundamentals of characters and string 4.4 String class and operations 4.5 String Buffer class and methods	09	14
Unit 5	Exploring Java I/O 5.1 Java I/O Class and Interface 5.2 I/O Stream Classes 5.3 Serialization 5.4 Buffer stream and print stream 5.5 Random Access File	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
 2. Internal Test – II: 15 Marks
 3. Best of Two Internal Tests will be considered as internal mark
- Total Marks: 30 Marks**

Reference / Text-Books / Additional Reading:

1. Compete Reference Java By Herbert Schildt Publisher: TMH
2. Programming in JAVA By E-Balaguruswami
3. JAVA PROGRAMMER'S REFERENCE by GRANT PALMER



Paper No: 403: RDBMS Client Server Programming

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	An Overview Of DBMS & Introduction to RDBMS 1.1 Introduction to DBMS & RDBMS. 1.2 Relational Database Structure, The object relational model. 1.3 E-R Diagram. 1.4 Client Server Architecture, Distributed processing, Multi tier Architecture. 1.5 Code's Rules	09	14
Unit 2	Introduction to Oracle 2.1 How oracle works. 2.2 Space Management, Memory Structure. 2.3 Oracle's process architecture. 2.4 Schema & Schema Object: Tables, Views, Sequences, Synonyms and Indexes. 2.5 Cluster & Hash Cluster.	09	14
Unit 3	SQL * Plus 3.1 Introduce DDL, DML, DCL. & TCL 3.2 Oracle data types. 3.3 Types of integrity, integrity constraints. 3.4 Simple and advance query generation. 3.5 Create View, Sequence, index.	09	14
Unit 4	PL / SQL 4.1 PL / SQL Blocks. 4.2 How PL / SQL works, Control structure. 4.3 Cursor: Declaring Cursor, Attributes of cursor, Accessing cursor, Closing cursor. 4.4 Trigger: Components of trigger, types of trigger, creating a trigger. 4.5 Stored Procedure & Function: Creating stored procedure, Executing stored procedure, Creating Function, Executing Function.	09	14
Unit 5	Introduction to DBA 5.1 Role of DBA. 5.2 Users: Creating a new user, grant command, deleting user. 5.3 Privileges: System privileges, object privileges, Assigning object privileges to a user, Viewing User & privileges, revoking a system & an object privileges. 5.4 Role: Creating a role, Granting privileges & roles to a role, granting role to a user, viewing the role of a user. 5.5 Database Backup & Recovery and import-export utility.	09	14



Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Learn Oracle 8i. By Jose A. Ramalho. Published by: BPB
2. SQL in 21-Days - Techmedia
3. PL/SQL in 21 Days - Techmedia
4. SQL, PL/SQL:THE PROGRAMMING LANGUAGE OF ORACLE By Evan Bayross



Paper No: 404: Object Oriented Analysis and Design

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction to object oriented modeling 1.1 Introduction 1.2 Characteristics and benefits 1.3 OOAD tools introduction 1.4 Object Oriented Analysis 1.5 Analysis Techniques	09	14
Unit 2	Using UML 2.1 Object model Notation 2.2 Basic Concept 2.3 structural Diagram 2.4 Behavioral Diagrams 2.5 Modeling With Objects	09	14
Unit 3	Object Oriented Design 3.1 Overview of system design 3.2 Braking system into subsystem, Concurrency Identification 3.3 Management of data store 3.4 Controlling event between objects 3.5 Handling Boundary Condition	09	14
Unit 4	Object Design 4.1 Object Design processing, Steps and solution 4.2 Choosing algorithms and data structure 4.3 Defining Classes 4.4 Controls and its implementation 4.5 Inheritance, Association, and Object Representation	09	14
Unit 5	Modeling and implementation strategies 5.1 Object Modeling. 5.2 Dynamic Modeling 5.3 Functional Modeling 5.4 Implementation Strategies 5.5 Case Study	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Object Oriented Analysis and Design by James Rumbaugh, Michael Blaha, William Premerlain, Frederick Eddy, William Lorenson
2. Object-Oriented Analysis and Design', John Deacon, Addison-Wesley
3. Object-oriented Analysis And Design by Andrew Haigh Tata Mcgraw Hill



Paper No: 405: Internet Technology and Scripting Language

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Internet Fundamentals 1.1 Internet, Intranet, Extranet 1.2 Internet Applications (WWW, E-mail, FTP, IRC, Web Chat, Newsgroup, UseNet, BBS, NetMeeting, Video Conferencing) 1.3 Email protocols (SMTP, POP3, IMAP) 1.4 Introduction to TCP/IP, DNS, MIME Types 1.5 Search Engines, Popular Search Engines and its working.	09	14
Unit 2	HTML and DHTML 2.1 Basic Of HTML 2.2 Formatting of text, working with Image 2.3 Hyperlink 2.4 List, Tables and Frames 2.5 Forms	09	14
Unit 3	Java Script 3.1 Java Script variable and Data Type 3.2 Statements and operators 3.3 Control Structure 3.4 Message Box in java script 3.5 Objects Based Programming	09	14
Unit 4	VB Script 4.1 Introduction 4.2 Data type, variable, constant and operators 4.3 Conditional and looping statement 4.4 Dictionary object 4.5 Error object	09	14
Unit 5	Introduction to e-commerce 5.1 Overview of Internet Security 5.2 Firewalls, SSL 5.3 Introduction to e-Commerce 5.4 Types of e-Commerce 5.5 Application of e-Commerce	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Duglass Comer: Internet - An Introduction Prentice-Hall of India Pvt. Ltd.
2. Ned Snell: Teach your self to create web pages in 24 hours Techmedia pub.
3. Evan Bayross: WEB enabled Comm. Appli. Develop. using HTML, DHTML, JAVASCRIPT, PERL CGI



Paper No: 406: Data Communication and Networking

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction & Transmission Media 1.1 Communication System 1.2 Analog & Digital Data 1.3 Communication Channel 1.4 Twin Wire and Co-axial cable 1.5 Radio VHF & Microwaves, Fiber Optic (Intro.) & satellite.	09	14
Unit 2	Optical Fiber Communication & Satellite Communication 2.1 Optical Source 2.2 Propagation in Fiber 2.3 Light Detectors 2.4 FDDI 2.5 Satellite Link and Satellite Communication	09	14
Unit 3	Data Networks & Data Communication System 1.1 Circuit Switching & Packet Switching 1.2 PABX 1.3 Facsimile (Fax) 1.4 Digital Telephony 1.5 Introduction to ISDN	09	14
Unit 4	Network Topology, Architecture & Standards 4.1 Introduction LAN, WAN, MAN and Network Topologies 4.2 OSI Model 4.3 Local Area Network 4.4 Ethernet, Token Bus & Token Ring 4.5 IEEE Standards 802 For LAN and MAN	09	14
Unit 5	Network Protocol and Fire Wall 5.1 TCP/IP, ATM, DLP, X.25 5.2 Inter-networks 5.3 BRIDGES, ROUTERS AND BROUTERS, GATEWAYS 5.4 Repeaters, Modems, Hubs and switches 5.5 Fire-Walls	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
 2. Internal Test – II: 15 Marks
 3. Best of Two Internal Tests will be considered as internal mark
- Total Marks: 30 Marks**

Reference / Text-Books / Additional Reading:

1. Andrews Tananbaum: Computers Networks, PHI
2. Michel and Miller: Introduction to Digital Data Communication
3. James Martin: Telecommunication and Compute



Paper No: 407: Practical

Marks: **100**

Credits: **12**

Practical based on Paper No.	Practical Hours (Total 180 Hours)	Marks/ Weight
Paper No – 402	40	30
Paper No – 403	70	35
Paper No – 405	70	35



B.C.A.
SEMESTER – V

Paper No: 501: MULTIMEDIA & APPLICATION

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Multimedia – the concept 1.1 Introduction 1.2 Main properties of multimedia system 1.3 Multimedia system definition 1.4 Combination of media 1.5 Use of multimedia in Education, Entertainment, Advertisement, etc.	09	14
Unit 2	Components of Multimedia-1 (Text & Graphics) 2.1 Text 2.2 Images 2.3 Graphics 2.4 Basic concept, Digital image representation 2.5 Image& Graphic format	09	14
Unit 3	Components of Multimedia 3.1 Digital Audio - Basic sound concept, representation of sound, audio formats 3.2 MIDI – Basic concepts, devices, software 3.3 Basic concept of Video 3.4 Signal representation and Computer video format 3.5 Basic concept of animation and languages	09	14
Unit 4	Data Compression 4.1 Compression technique, 4.2 JPEG 4.3 MPEG 4.4 Conventional storage media 4.5 Optical storage media	09	14
Unit 5	Multimedia Applications 5.1 Application of multimedia 5.2 General Design Issues 5.3 Planning of multimedia 5.4 Design of Multimedia 5.5 Media preparation, composition, integration, communication, entertainment	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Multimedia: Computing, Communications and Application by Ralf Steinmetz and Klara Nahrshedt (Pearson Education Asia)



Paper No: 502: Advance Java Programming

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit 1	Java applet programming and Event Handling 1.1 Types of Applets, Applet Architecture 1.2 An Applet Skeleton 1.3 Simple Applet Display Methods, Passing Parameters to Applets 1.4 Event Handling Mechanisms 1.5 The Delegation Event Model, Event Classes	09	14
Unit 2	AWT – Working with Windows, Graphics, Text and Controls 2.1 AWT Classes 2.2 Windows Fundamental 2.3 Frame Windows, Frame Window in Applet 2.4 Graphics, color, Text output Using Font Metrics 2.5 Controls – Labels, Button, Check Box, Scroll bar, Text field and Text area	09	14
Unit 3	Java Database Connectivity (JDBC) 3.1 Introduction of JDBC, JDBC Architecture 3.2 Steps of Database Connectivity 3.3 Statement and Result Set Object 3.4 Types of JDBC Drivers 3.5 Creation of Database	09	14
Unit 4	Networking 4.1 Basics of Java Networking 4.2 Definition of TCP/IP Client-Server Sockets 4.3 Proxy Server 4.4 Definition of IP Address , DNS 4.5 Theory of Datagram	09	14
Unit 5	Servlets 5.1 Introduction to Servlet 5.2 JSDK 5.3 Lifecycle of Servlet 5.4 Steps For Creating a Servlet 5.5 Running a Servlet	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Complete Reference Java By Herbert Schildt Publisher: TMH
2. PROGRAMMING WITH JAVA A PRIMER By E-Balaguruswami
3. JAVA PROGRAMMER'S REFERENCE



Paper No: 503: Web Application Development Using ASP.Net

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction 1.1 Introduction of Visual Web Developer 1.2 Basics of Web Application Development 1.3 Application and State 1.4 Introduction of Web-Forms 1.5 Basics Controls	09	14
Unit 2	Standard Controls 2.1 Image Control 2.2 Drop Down Lists, Bulleted Listed, Checkbox, Radio Buttons 2.3 Hyper link, Tables Panels 2.4 Tree View Control and Menu 2.5 Sitemap Path control and Wizard Control	09	14
Unit 3	Advance Controls 3.1 Required Field Valuators, Range Validators, Regular Expression Valuators 3.2 Custom Validations, Validation Summary, Calendars Validation Groups and Ad Roteters 3.3 Login Controls 3.4 HTML Controls 3.5 Master Pages and Themes	09	14
Unit 4	Working With Data Base 4.1 Working MS-SQL-Server Database 4.2 Working With ADO.NET 4.3 Accessing Data with Sever Explores, Binding Data 4.4 Database programming using code 4.5 Working with data controls	09	14
Unit 5	Working With Ajax Controls and Web-Services 5.1 Architecture of ASP.NET Ajax 5.2 Working with Ajax Controls 5.3 Introduction to Web-Services 5.4 Creating and Deploying web services 5.5 Sharing Data Across Web Services	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. ASP.NET Black BOOK Published By Dreamtech Press
2. ASP.NET UNLEASHED By STEPHEN WALTHER
3. MASTERING ASP.NET WITH VB.NET by A. RUSSELL JONES



Paper No: 504: Operation Research

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Overview of OR & Linear Programming - I 1.1 Introduction to OR, Operation Research Definitions, Application of OR 1.2 Linear Programming introduction, Structure of LPP, Assumptions of LPP. 1.3 General and Standard forms of LPP, Graphical Method in Solving LPP. 1.4 Simplex method. 1.5 Simple (maximum 3 Iteration) examples based on above models.	09	14
Unit 2	Linear Programming – II 2.1 Big M method and Two-Phase Method 2.2 Duality of L.P.P, Relation between Dual and Primal problems. 2.3 Formulation of Dual problem from primal problems 2.4 Solving Dual L.P.P. by simplex method and Big M method 2.5 Simple (maximum 3 Iteration) examples based on above	09	14
Unit 3	Transportation Problem & Assignment Problem 3.1 Transportation problem: Introduction, Mathematical formulation, Balanced and Unbalanced Transportation Problem. 3.2 Initial Basic Feasible Solution: North-West corner method, Least Cost Method & Vogel’s Approximation Method. 3.3 Optimum Solution: Modified Distribution Method. 3.4 Degeneracy in Transportation Problem. 3.5 Special Cases in Transportation Problem: Maximization, Unbalanced Transportation problem Alternate Optimum Solution and its examples.	09	14
Unit 4	Assignment Problem 4.1 Introduction of Assignment Problem. 4.2 Mathematical Model, Hungarian method of solving A.P. 4.3 Special cases in Assignment Problem: Maximization case of A.P., Unbalanced A.P., Multiple Optimum Solution 4.4 Difference between Transportation and Assignment Problem. 4.5 Traveling Salesman Problem, Mathematical Model of TP and Examples.	09	14
Unit 5	Sequencing Problem & Game Theory 5.1 Sequencing problem: Notation – Terminology & Assumptions. 5.2 Processing n – jobs through 2 machines problem. 5.3 Processing n – jobs through 3 machines problem. 5.4 Introduction of Game Theory, Players, Strategy, Payoff Matrix, Maximin Principle, Minimax Principle, Saddle Point, Value of the game. Two person Zero-Sum game. 5.5 Game with pure Strategies, Game with Mixed Strategies, Dominance Property.	09	14



Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
 2. Internal Test – II: 15 Marks
 3. Best of Two Internal Tests will be considered as internal mark
- Total Marks: 30 Marks**

Reference / Text-Books / Additional Reading:

1. J.K.Sharma: O.R.: Theory & Application – Macmillan India Ltd
2. Kantiswaroop, Gupta and Manmohan: Operations Research- Sultan Chand & Sons
3. Hamdy A. Taha: Operations Research-Prentice Hall of India Private ltd.
4. R.Panneerselvam: Operations Research –Prentice Hall of India Private ltd.
5. V. K. Kapoor: Operations Research (Techniques for Management), Sultan Chand & Sons.



Paper No: 505: Computer Graphics

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**
 Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction 1.1 Computer Graphics Introduction 1.2 Application of Computer Graphics 1.3 Computer Graphics Tools and GUI Interface 1.4 Computer Graphics Software standard 1.5 Vector Graphics and Raster Graphics	09	14
Unit 2	Hardware 2.1 Overview of different video display devices like Cathode ray tubes, random scan-raster scan monitors, color CRT monitors, Direct View Storage. 2.2 Hardcopy devices: printer, plotters 2.3 Input devices: keyboard, touch panels, light pens, mouse, track Balls, space balls, voice system, joysticks etc. 2.4 Graphics function. 2.5 Computer Graphics Cards	09	14
Unit 3	Output Primitives & Attributes 3.1 Primitives: Points, Links, Circles, Line Drawing- algorithms, Circle generating algorithms, 3.2 Filled area primitives, Scan line polygon fill algorithm 3.3 Inside-outside tests, boundary-fill algorithm, etc. 3.4 Character generations 3.5 Attributes like: Line, Color, Area-fill and Text..	09	14
Unit 4	Two Dimensional Transformations 4.1 Composites Transformations: Translations, Rotation, Scaling 4.2 Matrix Representation. 4.3 Window and Clipping: Line clipping, Area clipping, Text clipping 4.4 Windows to view point transformations 4.5 Reflection	09	14
Unit 5	Interactive Picture Construction Techniques 5.1 Rubber bending methods 5.2 Zooming, Dragging and Panning 5.3 Hidden surface removal 5.4 Concept of 3-D Graphics 5.5 3-D Graphics Packages	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
 2. Internal Test – II: 15 Marks
 3. Best of Two Internal Tests will be considered as internal mark
- Total Marks: 30 Marks**

Reference / Text-Books / Additional Reading:

1. F. S. Hill: Computer Graphics (MacMillan Publishing Co)
2. Rajaraman : Objext Oriented Programming and C++ (New age international publisher)
3. Donald Hearn and M. Paulin Baker: Computer Graphics (PHI)



Paper No: 506: Advance Database Management

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Advanced Data modeling 1.1 Concepts and methodology of Data modeling 1.2 Types of models – relational, post-relational, dimensional, object oriented 1.3 Structural Semantic Data Model (SSM) – concepts of SSM 1.4 Modeling Multiple Media Data Collections – Metadata for Multimedia (semantic, context and structural Metadata) 1.5 Modeling Multimedia collections in SSM	09	14
Unit 2	Object Oriented Databases 2.1 Object Oriented Concepts 2.2 Characteristics of an Object Oriented Data Model 2.3 OODM and previous Data models – similarities and differences 2.4 Features for Object Oriented system 2.5 OODBMS – pros and cons.	09	14
Unit 3	Data warehouse and Data mining 3.1 Concept of Data warehouse and Data mining – history of Data warehousing 3.2 Advantages of Data warehouse and Data warehouse architecture 3.3 Data mining functions 3.4 Data mining techniques 3.5 Advantages of data mining	09	14
Unit 4	Distributed Database Systems 4.1 Introduction of Database system, client, server and nodes 4.2 Direct and indirect connections – distributed DBMS architecture 4.3 Schema objects and naming in a Distributed Database 4.4 Advantages and disadvantages of the DDBMS 4.5 Features of Distributed vs. Centralized Database	09	14
Unit 5	Database Security 5.1 Introductory terms – privacy, database security, database integrity, authorization 5.2 Security and Integrity threats – Accidental and Intentional 5.3 Security policies – Access control, Information flow 5.4 Access types 5.5 Identification and Authentication	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Bipin C. Desai – An Introduction to Database Systems
2. Avi Silberschatz, Henry F. Korth, S. Sudarshan – Database System Concepts, McGraw-Hill
3. Raghu Ramakrishnan, Johannes Gehrke – Database Management System, Tata McGraw Hill



Paper No: 507: Practical

Marks: **100**

Credits: **12**

Practical based on Paper No.	Practical Hours (Total 180 Hours)	Marks/ Weight
Paper No – 504	40	30
Paper No – 502	70	35
Paper No – 503	70	35



B.C.A.
SEMESTER – VI

Paper No: 601: Data Warehouse and Data Mining

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**
 Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction to Data Warehousing 1.1 Data ware housing Definition, usage and trends 1.2 DBMS vs. data warehouse, Data marts, Metadata 1.3 Multidimensional data model, Data cubes 1.4 Schemas for Multidimensional Database: stars, snowflakes and fact constellations 1.5 Data warehouse process & architecture	09	14
Unit 2	Data warehouse architecture 2.1 Introduction to OLTP, OLAP, ROLAP, MOLAP 2.2 Comparison: OLTP vs. OLAP, ROLAP vs. MOLAP 2.3 Data warehouse servers 2.4 3 – Tier data warehouse architecture, Design and Construction of Warehouses 2.5 Distributed and virtual data warehouses, data warehouse manager.	09	14
Unit 3	Introduction to Data mining 3.1 Introduction to Universal Data and Definition of Data Mining, 3.2 Data mining functionalities 3.3 Classification of Data mining Systems 3.4 Major Issues in Data Mining 3.5 Data mining Applications	09	14
Unit 4	Data mining techniques 4.1 Data Mining techniques, tools and applications 4.2 Data Processing (Data Cleaning, Integration and Transformation, Reduction) 4.3 Data mining Primitives and DMQL 4.4 Designing GUI based on a DMQL 4.5 Architecture of Data Mining System	09	14
Unit 5	Advance Data Mining 5.1 Mining Complex Data Objects 5.2 Mining Multimedia Databases 5.3 Mining Spatial Databases 5.4 Mining Time-Series and Sequence Data 5.5 Mining WWW and Data Mining Applications	09	14



Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Data Mining – Concepts & Techniques; Jiawei Han & Micheline Kamber – First Indian Reprint 2002, Morgan Kaufmann publication.
2. Data Warehousing in the Real World; Sam Anahory & Dennis Murray; 1997, Pearson
3. Data Mining Techniques; Arun Pujar; 2001, University Press; Hyderabad.
4. Data Mining; Pieter Adriaans & Dolf Zantinge; 1997, Pearson
5. Data Warehousing, Data Mining and OLTP; Alex Berson, 1997, McGraw Hill.
6. Data warehousing System; Mallach; 2000, McGraw



Paper No: 602: Mobile Application Development using J2M

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	<p>J2ME Overview</p> <p>1.1 Java and its concepts, Java Virtual Machine, J2EE and J2SE, Inside J2ME, How J2ME Is Organized, J2ME and Wireless Devices, Other Java Platforms for Small</p> <p>1.2 Small Computing Technology: Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistants, Mobile Power, Set-Top Boxes, Smart Cards</p> <p>1.3 J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, J2ME Best Practices and Patterns</p> <p>1.4 MIDlet Programming: Event Handling, User Interfaces, Device Data. J2ME Software Development. Hello World J2ME Style:Compiling Hello World Running Hello World Deploying Hello World What to Do When Your MIDlet Doesn't Work Properly Multiple MIDlets in a MIDlet Suite</p> <p>1.5 J2ME Wireless Toolkit: Building and Running a Project, Hello World Project MIDlets on the Internet</p>	09	14
Unit 2	<p>J2ME User Interface & High Level Display</p> <p>2.1 J2ME User Interfaces, The Palm OS Emulator, Display Class.</p> <p>2.2 Command Class, Item Class, Exception Handling</p> <p>2.3 Screen Class, Alert Class, Alert Sound, Form Class</p> <p>2.4 Item Class: ChoiceGroup Class, DateField Class, Gauge Class, StringItem Class, TextField Class, ImageItem Class</p> <p>2.5 List Class, TextBox Class, Ticker Class</p>	09	14
Unit 3	<p>Low Level Display</p> <p>3.1 Canvas: The Layout of a Canvas, Proportional Coordinates, The Pen, Painting showNotify() and hideNotify()</p> <p>3.2 User Interactions: Working with Key Codes, Working with Game Actions, Working with Pointer Devices</p> <p>3.3 Graphics: Stroke Style and Color, Lines, Rectangles, Arcs, Text, Images, Repositioning Text and Images</p> <p>3.4 Clipping Regions</p> <p>3.5 Animation</p>	09	14
Unit 4	<p>J2ME Data Management</p> <p>4.1 Record Management System: Record Storage, Writing and Reading Records, Sorting Records, Searching Records.</p> <p>4.2 J2ME Database Concepts: Data, Databases, Tables, Normalizing Data, Grouping Data, Creating Primary Keys, Foreign Keys, Referential Integrity, Indexing</p> <p>4.3 JDBC Objects: The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process.</p> <p>4.4 Database Connection, Statement Objects, ResultSet, Transaction Processing, Savepoints, Metadata, Data Types, Exceptions</p> <p>4.5 JDBC and Embedded SQL: Create a Table, Inserting Data into Tables, Selecting Data from a Table, Updating Tables, Deleting Data from a Table.</p>	09	14



Unit 5	J2ME Networking and Web Services 5.1 The Generic Connection Framework: Review of HTTP, Making a Connection with HTTP GET, Posting a Form with HTTP POST, Using Cookies for Session Tracking, Design Tips, Using HTTPS, Using Datagram Connections, Other Connection Types, Responding to Incoming Connections, Permissions for Network Connections 5.2 Wireless Messaging API: SMS: WMA and SMS, WMA AP, Sending Binary SMS Messages Sending Text SMS Messages, Receiving SMS Messages, A Nonblocking Approach to Receiving SMS Messages, Examining Message Headers: Receiving CBS Messages, Working with SMS APIs, Sending SMS Messages, Multimedia Messaging with WMA 2.0, A MIDlet to Send and Receive MMS, Testing MMS Send and Receive. 5.3 Bluetooth: Bluetooth, CLDC, and MIDP, Networking with Devices Near You, The Bluetooth Service Model, The Bluetooth API: Accessing Local Bluetooth Stack, Discovering Devices, Starting and Stopping Device Discovery, A Simpler Way to Discover Devices, Discovering Services, Access to Remote Devices 5.4 The Bluetooth Control Center, Service Record and Service Attributes, Creating a Bluetooth Service, A Bluetooth Dating Service: Setting Your Dating Preferences, Coding the Bluetooth Client, Coding the Bluetooth Service. 5.5 Infrared Communications and OBEX: OBEX Requests, Obtaining OBEX Client and Server Connections, An OBEX Dating Service: Coding the OBEX Dating Service Client, Coding an OBEX Service	09	14
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Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
 2. Internal Test – II: 15 Marks
 3. Best of Two Internal Tests will be considered as internal mark
- Total Marks: 30 Marks**

Reference / Text-Books / Additional Reading:

1. J2ME Complete Reference James Keogh, McGraw-Hill
2. Beginning J2ME- SING LI AND JONATHAN KNUDSEN



Paper No: 603: Advanced Linux Programming (Using C- Shell)

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction 1.1 Introduction Of Linux operating system 1.2 History Of Unix and Linux, Feature of Linux Operating system 1.3 Introduction of various GUI tools, Introduction of various Linux flavor 1.4 The History of X Windows; The Downside; Enter KDE and GNOME; About KDE; Licensing issues; Starting X Windows and KDE; KDE Basics; The KDE Control Center; About GNOME; Starting X Windows and GNOME; GNOME Basics; Packages and Management The GNOME Configuration Tools	09	14
Unit 2	File System structure and Shell Programming 2.1 Understanding File system Hierarchy Standard 2.2 Managing partitions, Using formats and journals 2.3 Exploring Logical Volume Management, Linux Shell Commands 2.4 Vi Editor 2.5 Advance Shell Programming	09	14
Unit 3	Administration 3.1 Administering Local Users, group and other users. 3.2 Administering User Accounts and password and security 3.3 Monitoring currently logged in users and past system logins 3.4 Managing and monitoring process. 3.5 Formatting and disk partitioning, Checking File system, Backup and	09	14
Unit 4	Networking With Linux 4.1 Basic Concept of Network System 4.2 General TCP/IP Networking 4.3 The IP Address, IP address classes and Masks, Port Number, DNS 4.4 Network File Configuration. 4.5 Monitoring your Network Using Network Utility	09	14
Unit 5	Server Configuration 5.1 Concept of NFS Configuration, 5.2 FTP Server Fundamentals 5.3 Linux Web Server Configuration 5.4 Installing Samba, Configuring samba on Linux 5.5 Sharing and printing files with Samba	09	14



Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Peter Nortons's: Complete Guide to Linux, Techmedia
2. Michael Jang: Read Hat Linux 9, BPB Publication
3. Bill Ball, David Pits Et al. Unleashed Read Hat Linux, Techmedia
4. Brian Proffitt: Rea Hat Linux Fast & easy, PHI
5. Yashwant Kanitkar: Unix Shell Programing, BPB Publication



Paper No: 604: Management Information System

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction to Management Information Systems 1.1 MIS Concepts –EIS, DSS, MRS, TPS and OIS 1.2 Concept of Organization, Management and Information 1.3 Information – Meaning, Uses and Cost of Information 1.4 The need for Information system 1.5 Information management model – diagnosis, evaluation	09	14
Unit 2	The Structure of MIS 2.1 Types of organizational Information: TPS, MRS, DSS, EIS, OIS 2.2 Characteristics of MRS 2.3 Reports by MRS – Report’s forms: Scheduled(Periodic) Report, Exception Report, Demand Report 2.4 Characteristics of DSS 2.5 Characteristics of EIS and the role of expert system	09	14
Unit 3	Information needs for strategic planning 3.1 Concept of value streams and strategy 3.2 Characteristics of information – cost, accessibility, reliability, security 3.3 Strategies for competitive advantages – differentiation, cost leadership, focus, linkage, information leadership 3.4 Information usage for strategic advantage 3.5 International strategy	09	14
Unit 4	Introduction of Enterprise Resource Planning (ERP) 4.1 Concept of Enterprise Management System (EMS) and ERP 4.2 ERP Architecture and EMS model 4.3 ERP Solution Structure – business operations, technology and implementation 4.4 ERP Basic Features, Characteristics of ERP solutions and benefits of ERP 4.5 ERP Selection – Vendor evaluation factor, technology evaluation factor, ERP solution evaluation	09	14
Unit 5	Development of MIS plan and Quality and Privacy issues 5.1 Contents of MIS plan 5.2 MIS plan is linked to the business plan 5.3 Classification of information – organizational, functional, knowledge, decision support and operational 5.4 Management of Quality in MIS 5.5 Ethical and social issues with network	09	14



Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Management Information System By K.C. Laudon. and J.P. Laudon. PHI
2. Enterprise Information System by J. O'Brien and G. Marakas. TMH
3. Management Information System By Sadagopan



Paper No: 605: Cryptography and Network Security

Marks: **100**

Credits: **03**

Marks: Semester End Examination: **70 Marks**

Continuous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Introduction to encryption techniques 1.1 Concept of Encryption and decryption, importance of encryption 1.2 Basic types of encryption – one-time pad, end-to end and link encryption, advantages and disadvantages of all methods of encryption 1.3 Symmetric cipher model – Cryptography, cryptanalysis 1.4 Cryptographic keys –Private key and public key 1.5 Staganography	09	14
Unit 2	Network Security Fundamental 2.1 Concept of Security based on Network, OSI Security Architecture – Security Attack, Security Mechanism and Security service 2.2 Types of Security Attacks – Active and Passive Attacks 2.3 Security Services - Authentication, Access Control, Data Confidentiality and Data integrity 2.4 Security Mechanism –Specific Security mechanism 2.5 A Model for network security	09	14
Unit 3	E-Mail, IP Security and Network Device Security 4.1 S/MIME, Application of IP Security, 4.2 Benefits of IP Security 4.3 IP Security Architecture 4.4 IP security Services 4.5 Switch, Bridge, Router	09	14
Unit 4	Network Device Security 4.1 Switch 4.2 Router 4.3 Network Hardening 4.4 Administrative Practices 4.5 Centralizing Account Management	09	14
Unit 5	Firewall & Wireless Network 5.1 Introduction to firewall 5.2 Additional Firewall Function 5.3 Introduction to Virtual Private Network 5.4 VPN Protocol 5.5 Introduction to Wireless Network Security	09	14

Break up of Continuous Internal Evaluation:

1. Internal Test – I: 15 Marks
2. Internal Test – II: 15 Marks
3. Best of Two Internal Tests will be considered as internal mark

Total Marks: 30 Marks

Reference / Text-Books / Additional Reading:

1. Cryptography and Network Security – William Stallings Pearson – Printice Hall
2. Computer Security Basics Rick Lebtinen, Derborah Russle, G.T. Gangeni Sr. O REILLY



Paper No: 606: Project

Marks: 100 Marks

Credits: 03

1. The project is to be considered as part time course work of the syllabus.
2. Total Working Hours of the Project must not be Less than 90 Hours, Which includes Field Work, guidance provided by the Faculty & Practical Work
3. Total marks will be divided as under:
 - ♣ Project report evaluation (40 marks)
 - ♣ Viva voce with presentation (60 marks)

Paper No: 607: Practical

Marks: 100

Credits: 12

Practical based on Paper No.	Practical Hours (Total Hours 180)	Marks/ Weight
Paper No – 602	90	50
Paper No – 603	90	50