

BHAVNAGAR UNIVERSITY

BHAVNAGAR

(NACC Accreditation Grade “B”)

CREDIT AND SEMESTER SYSTEM

SYLLABUS

MASTER OF SCIENCE (M.Sc.)

INFORMATION TECHNOLOGY

(In Force From Academic Year: 2010-2011)

तमसा मा ज्यातिगमय



M.Sc.
Credit and Semester System Syllabus

NAME OF THE SUBJECT: INFORMATION TECHNOLOGY

SEMESTER – 1st

SR. NO.	PAPER NO	NAME OF THE PAPER	TOTAL MARKS EXT + INT = TOTAL	PASSING STANDARD EXT + INT = TOTAL	TOTAL TEACHING HOURS	EXAM HOURS	CREDITS
1	1	Computer System Organization	70 + 30 = 100	28 + 12 = 40	15 Weeks x 4 Hours = 60	3	04
2	2	Discrete Mathematics	70 + 30 = 100	28 + 12 = 40	15 Weeks x 4 Hours = 60	3	04
3	3	Data Structures and Algorithm	70 + 30 = 100	28 + 12 = 40	15 Weeks x 4 Hours = 60	3	04
4	4	Programming Lab-I (Practical)	100 + 00 = 100	40 + 00 = 40	15 Weeks x 10 Hours = 150	3	10

<u>* INTERNAL</u>	<u>MARKS</u>
ASSIGNMENT	05
SEMINAR	05
TEST	20



M.Sc.
Credit and Semester System Syllabus

NAME OF THE SUBJECT: INFORMATION TECHNOLOGY

SEMESTER – 2nd

SR. NO.	PAPER NO	NAME OF THE PAPER	TOTAL MARKS EXT + INT = TOTAL	PASSING STANDARD EXT + INT = TOTAL	TOTAL TEACHING HOURS	EXAM HOURS	CREDITS
1	5	Operating System	70 + 30 = 100	28 + 12 = 40	15 Weeks x 4 Hours = 60	3	04
2	6	Linear Algebra	70 + 30 = 100	28 + 12 = 40	15 Weeks x 4 Hours = 60	3	04
3	7	Data Base Management System	70 + 30 = 100	28 + 12 = 40	15 Weeks x 4 Hours = 60	3	04
4	8	Programming Lab-II	100 + 00 = 100	40 + 00 = 40	15 Weeks x 10 Hours = 150	3	10

<u>* INTERNAL</u>	<u>MARKS</u>
ASSIGNMENT	05
SEMINAR	05
TEST	20



M.Sc.
Credit and Semester System Syllabus

NAME OF THE SUBJECT: INFORMATION TECHNOLOGY

SEMESTER – 3rd

SR. NO.	PAPER NO	NAME OF THE PAPER	TOTAL MARKS EXT + INT = TOTAL	PASSING STANDARD EXT + INT = TOTAL	TOTAL TEACHING HOURS	EXAM HOURS	CREDITS
1	9	Data Communication and Network	70 + 30 = 100	28 + 12 = 40	15 Weeks x 4 Hours = 60	3	04
2	10	Software Engineering	70 + 30 = 100	28 + 12 = 40	15 Weeks x 4 Hours = 60	3	04
4	11	Internet & Scripting Languages	70 + 30 = 100	28 + 12 = 40	15 Weeks x 4 Hours = 60	3	04
3	12	Programming Lab-III	100 + 00 = 100	40 + 00 = 40	15 Weeks x 10 Hours = 150	3	10

<u>* INTERNAL</u>	<u>MARKS</u>
ASSIGNMENT	05
SEMINAR	05
TEST	20



M.Sc.
Credit and Semester System Syllabus

NAME OF THE SUBJECT: INFORMATION TECHNOLOGY

SEMESTER – 4th

SR. NO.	PAPER NO	NAME OF THE PAPER	TOTAL MARKS EXT + INT = TOTAL	PASSING STANDARD EXT + INT = TOTAL	TOTAL TEACHING HOURS	EXAM HOURS	CREDITS
1	13	Advanced Database: Concepts & Tools	70 + 30 = 100	28 + 12 = 40	15 Weeks x 4 Hours = 60	3	04
2	14	Advanced Data Structures and Algorithms (Using C++)	70 + 30 = 100	28 + 12 = 40	15 Weeks x 4 Hours = 60	3	04
3	15	Project Work	70 + 30 = 100	28 + 12 = 40	15 Weeks x 4 Hours = 60	3	04
4	16	Programming Lab-IV	100 + 00 = 100	40 + 00 = 40	15 Weeks x 10 Hours = 150	3	10

<u>* INTERNAL</u>	<u>MARKS</u>
ASSIGNMENT	05
SEMINAR	05
TEST	20



Master of Science in Information Technology
M.Sc. (I.T.)
SEMESTER – I

Paper No.: 1

Title of the Paper: **Computer System Organization**

Credits: 5

Marks: 100

Marks: Semester End Examination: 70 Marks

Continuous Internal Evaluation: 30 Marks

Unit	Detailed Syllabus	Teaching Hour	Marks/Weight
Unit 1	Introduction Block Diagram of a simple computer and its different functional units, Representation of Information, Number Systems, Integer & Floating Point representation, Character codes (ASCII & EBCDIC).	12	14
Unit 2	Processors, Memory and Input / Output. Instruction Execution, CPU organization, Parallel Instruction Execution, Microprocessor chips & Buses, Example of a typical Microprocessor, Memory: Main memory, Secondary memory, Types & Organization, Input / Output: Common types of I/O devices, Controllers.	12	14
Unit 3	Gates and Boolean Algebra, Gates, Boolean Algebra, Truth Tables, Preparing truth table for given circuit, Preparing circuit for given truth table (SOP & POS), De Morgan's Theorems, use of De Morgan's theorems to implement (i) SOP using NAND gates, and (ii) POS using NOR gates.	12	14
Unit 4	Basic Digital Logic Circuits. Integrated circuits, Combinational Circuits - Encoder, Decoder, Multiplexer, De-multiplexer, comparator, Arithmetic Circuits - Half adder, full adder, binary adder binary adder / subtractor.	12	14
Unit 5	Registers & Counters. Flip flops, Registers & Counters.	12	14

Break up of Continuous internal Evaluation:

- | | |
|---------------------|-----------------|
| 1. Assignment | 05 Marks |
| 2. Seminar | 05 Marks |
| 3. Test | <u>20 Marks</u> |
| Total Marks: | 30 Marks |

Reference Books:

1. Tanenbaum A. S.: Structured Computer Organization, Prentice-Hall of India Pvt. Ltd.
2. Malvino A. P.: Digital Computer Electronics, 2nd Edition, Tata McGraw-Hill Publishing Co. Ltd.



Paper No.: 2

Title of the Paper: **Discrete Mathematics**

Credits: 5

Marks: 100

Marks: Semester End Examination: 70 Marks

Continuous Internal Evaluation: 30 Marks

Unit	Detailed Syllabus	Teaching Hour	Marks/Weight
Unit 1	Poset, Hasse Diagrams, Lattices, Boolean Algebra, Application to switching Circuits.	12	14
Unit 2	Permutation, Combination, Recurrence Relations, Generating Functions, Principle of Inclusion and Exclusion.	12	14
Unit 3	Logic Logic operators AND, OR etc., Truth tables, Theory of inference and deduction, Mathematical Inductions.	12	14
Unit 4	Basic Concepts of Graphs and Trees, Adjacency and Incidence Matrices, Spanning Tree, Transitive Closure, Shortest Path, Planar Graphs.	12	14
Unit 5	Graph Colouring, Applications of Graph Theoretic Concepts to Computer Science.	12	14

Break up of Continuous internal Evaluation:

1. Assignment 05 Marks
 2. Seminar 05 Marks
 3. Test 20 Marks
- Total Marks: 30 Marks**

Reference Books:

1. J. P. Trembley and R. P. Manohar, Discrete Mathematical Structures with Applications to Computer Science, McGraw Hill.
2. N. Deo, Graph Theory with Applications to Engineering and Computer Science, PHI.
3. Ian Anderson, A first course in Combinatorial Mathematics, Clarendon Press, Oxford, 1974.
4. R. P. Grimaldi, Discrete and Combinatorial Mathematics, Pearson Education, 1999.
5. K. H. Rosen, Discrete Mathematics and Its Applications, Tata McGraw Hill, 2003.



Paper No.: 3

Title of the Paper: **Data Structures and Algorithm**

Credits: 5

Marks: 100

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

Unit	Detailed Syllabus	Teaching Hour	Marks/Weight
Unit 1	Basic Concepts of Data Representation Abstract data types, Fundamental and derived data types, Representation, Primitive data Structures.	12	14
Unit 2	Introduction to Algorithm Design and Data Structures Design and analysis of Algorithm, Algorithm definition, Comparison of Algorithms, Top-down and bottom up approaches to Algorithm design, Analysis of Algorithm, Frequency count, Complexity measures in terms of time and space, Structured approach to programming.	12	14
Unit 3	Arrays Representation of arrays, Single and multidimensional arrays, Address calculation using column and row major ordering, Various operations on Arrays, Vectors, Applications of arrays, Matrix multiplication, Sparse polynomial representation and addition.	12	14
Unit 4	Stacks and Queues Representation of stacks and queues using arrays and linked-list, Circular queues, Priority Queue and D-Queue, Applications of stacks, Conversion from infix to postfix and prefix expressions, Evaluation of postfix expression using stacks.	12	14
Unit 5	Singly linked list, Operations on list, Linked stacks and queues, Polynomial representation and manipulation using linked lists, Circular linked lists, Doubly linked lists, Generalized list structure, Sparse Matrix representation using generalized list structure.	12	14

Break up of Continuous internal Evaluation:

1. Assignment 05 Marks
 2. Seminar 05 Marks
 3. Test 20 Marks
- Total Marks: 30 Marks**

Reference Books:

1. Dr. Madhulika Jain, Shashi Singh and Satish Jain, Data Structure Through 'C' Language, BPB Publications.
2. Y. Langsam, M. J. Augenstein and A. M. Tenenbaum, Data Structures Using C and C++, PHI.
3. Y. Kanetkar, Data Structure Through C, BPB Publications.



Paper No.: 4

Title of the Paper: **Programming Lab-I**

Credits: 10

Marks: 100

Practical Based On

Unit	Detailed Syllabus	Teaching Hour	Marks/Weight
Unit 1	Paper 3: Data Structure and Algorithm	45	30
Unit 2	Numerical Methods: Interpolation Interpolation with Equal Intervals - Forward, backward and central difference Tables, Gregory - Newton formula for forward & backward Interpolation, Gauss central difference formula, forward and backward, Interpolation for Unequal Intervals-Newton's general interpolation formula, Lagrange Interpolation. Numerical Integration & Differential Equations Numerical integration - Geometric meaning of integration, Trapezoidal rule, Simpson - 1/3 & 3/8 rules, Numerical solution of differential equations. Euler's method, Euler's modified method, Runge-Kutta methods.	45	30
Unit 3	C Language: Introduction to Programming Language C, Data Type, Operators and Expressions in C, Control and Repetitive Statements: IF-THEN-ELSE, SWITCH, WHILE, FOR, DO. Break and Continue Statements. Input and Output functions, Function and Program Structure in C, Parameter passing, Pointers, Array, String handling, Structures, C-Library.	60	40

Break up of Continuous internal Evaluation:

- | | |
|---------------------|-----------------|
| 1. Assignment | 05 Marks |
| 2. Seminar | 05 Marks |
| 3. Test | <u>20 Marks</u> |
| Total Marks: | 30 Marks |

Reference Books:

1. Rajaraman V.: Computer Oriented Numerical Methods, Prentice Hall of India Pvt. Ltd., 1983.
2. C. K. Kumbharana and N. N. Jani, Computer Oriented Numerical Methods (CONM), Saurashtra University, Rajkot.
3. B. W. Kernighan and D. M. Ritchie, The C Programming Language, PHI.
4. R. Sethi, Programming Languages, Addison-Wesley, 1996.
5. D. Appleby and J. J. VandeKopple, Programming Languages, Tata McGraw-Hill, 1991.



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SEMESTER – II

Paper No.: 5

Title of the Paper: **Operating System**

Credits: 5

Marks: 100

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

Unit	Detailed Syllabus	Teaching Hour	Marks/Weight
Unit 1	Evolution of Operating System, Basic concepts: User job, Resources, Batch processing, Multiprogramming, Time sharing, Process, Process Control Block.	12	14
Unit 2	Memory management Address Protection, Segmentation, Virtual Memory, Paging, Page replacement algorithms, Support for concurrent process: Mutual Exclusion, Shared Data, Critical Sections, Busy form of waiting, Lock and Unlock primitives, Synchronization, Blocking and wake up, Process Scheduling, Process states, Virtual processors, Interrupt mechanism, Scheduling Algorithms, Implementation of concurrency primitive.	12	14
Unit 3	System Deadlock Prevention, Detection and Avoidance.	12	14
Unit 4	Multiprogramming system Queue management, I/O Supervisors, Memory Management, File system, Disk scheduling.	12	14
Unit 5	Shell Programming, UNIX-C interface, System calls, Device Driver, Interrupt Handler. UNIX and Linux as example systems.	12	14

Break up of Continuous internal Evaluation:

1. Assignment 05 Marks
 2. Seminar 05 Marks
 3. Test 20 Marks
- Total Marks: 30 Marks**

Reference Books:

1. Peterson and Silberschatz, Operating System Concepts, Addison Wesley.
2. P. B. Hansen, Operating System Principles, PHI
3. K. Chritian, The UNIX Operating System, John Wiley.
4. A. N. Haberman, Introduction to Operating System Design, Galgotia.



Paper No.: 6

Title of the Paper: **Linear Algebra**

Credits: 5

Marks: 100

Marks: Semester End Examination: 70 Marks

Continuous Internal Evaluation: 30 Marks

Unit	Detailed Syllabus	Teaching Hour	Marks/Weight
Unit 1	Vector Space, Definition and Examples, Vector Subspaces, Linear Dependence and Independence, Span of a Set, Basis and Dimension of a Vector Space, Line, Affine Spaces, Quotient Spaces.	12	14
Unit 2	Linear Transformation, Representation of Linear Transformation by a Matrix, Kernel and Image of a Linear Transformation, Linear Isomorphism.	12	14
Unit 3	Geometric Ideas and rank, Identity, Stretch along axes, Reflection with respect to axes, Rotation, Shear, Projection, Their Combinations.	12	14
Unit 4	Inner Product Spaces, The Euclidean plane and the dot product, General Inner Product Spaces, Orthogonality, Geometrical Application, Orthogonal Projection onto a Line.	12	14
Unit 5	Orthonormal Basis, Orthogonal Complements and Projections, Linear functionals and hyper-planes, Orthogonal Transformations, Associated Co-ordinates, Reflections, Orthogonal map of the plane.	12	14

Break up of Continuous internal Evaluation:

1. Assignment 05 Marks
2. Seminar 05 Marks
3. Test 20 Marks

Total Marks: 30 Marks

Reference Books:

1. S. Kumaresan, Linear Algebra-A Geometric Approach, PrenticeHall, New Delhi, 2003.
2. K. B. Dutta, Matrix and Linear Algebra, PrenticeHall, New Delhi.
3. N. S. Gopalakrishnan, University Algebra, Wiley Eastern Ltd.



Paper No.: 7

Title of the Paper: **Data Base Management System**

Credits: 5

Marks: 100

Marks: Semester End Examination: 70 Marks

Continuous Internal Evaluation: 30 Marks

Unit	Detailed Syllabus	Teaching Hour	Marks/ Weight
Unit 1	DBMS Concepts Data abstraction, Database System architecture, Schemas and Subschemas, Data independence, Physical Data Organization: Hashed, Index file, B-tree.	12	14
Unit 2	Data Models Data modeling using entity relationship, Hierarchical and Network Model: DBTG proposals, Data manipulation languages.	12	14
Unit 3	Relational Model Relational Algebra and Calculus, Strong Organization for Relations, Functional, Multivalued and Project-Join dependencies, Decomposition, Normal Forms: First, Second, Third, BCNF, Fourth and PJ normal forms.	12	14
Unit 4	STRUCTURED QUERY LANGUAGE (SQL * PLUS) Tables, Primary key, Foreign key, Indexes, Data Definition Language: Create, Alter, Truncate, Drop, Data Manipulation Language: Insert, Update, Delete, Database Constraints.	12	14
Unit 5	Database Objects & Function View, Sequence, Synonyms, Transaction Control Language: Commit, Rollback, Savepoint, Data Control Language: Grant, Revoke, Database index, General SQL Function (Character, Arithmetic, Date, Conversion).	12	14

Break up of Continuous internal Evaluation:

1. Assignment 05 Marks
2. Seminar 05 Marks
3. Test 20 Marks

Total Marks: 30 Marks

Reference Books:

1. C. J. Date, An Introduction to Database Systems, Vol I & II, Addison Wesley.
2. J. D. Ullman, Principle of Database Systems, Galgotia, New Delhi,
3. Wiederhold, Database Design, McGraw Hill.
4. SQL, PL/SQL The Programming Language of Oracle by Ivan Bayross, 3rd Edition
5. Learn Oracle 8i by Jose A Ramalho



Paper No.: 8

Title of the Paper: **Programming Lab-II**

Credits: 10

Marks: 100

Practical Based On

Unit	Detailed Syllabus	Teaching Hour	Marks/Weight
Unit 1	Paper 7: Data Base Management System	75	50
Unit 2	Object Oriented Programming: Objects & Classes Class Definition, Constructors, Destructors, Objects as function arguments, Memory management of Classes, Objects and static data, Array as class member data & Array of objects Classes within classes Operator Overloading & Inheritance. Overloading of unary & binary operators, Data Conversion between Basic types, Objects and Different, Classes, Concept of derived class & base class, Constructor for derived & base class, Public & private inheritance, Levels of inheritance, Multiple inheritance, Templates & File Handling.	75	50

Break up of Continuous internal Evaluation:

1. Assignment 05 Marks
 2. Seminar 05 Marks
 3. Test 20 Marks
- Total Marks: 30 Marks**

Reference Books:

1. Robert Lafore, Object Oriented Programming in Turbo C++, Guide, Galgotia Pub. (P) Ltd.
2. E Balagurusamy, Object Oriented Programming in C++, Tata McGraw-Hill Publishing Co. Ltd.
3. Barkakati N., Object Oriented Programming in C++, PHI.
4. OOP's using C++ for Dummies.



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SEMESTER – III

Paper No.: 9

Title of the Paper: **Data Communication and Network**

Credits: 5

Marks: 100

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

Unit	Detailed Syllabus	Teaching Hour	Marks/Weight
Unit 1	Introduction to computer Network and the Internet: Internet-Birds' Eye View: Protocol-Examples, Internet-Layered Architecture.	12	14
Unit 2	Application Layer – HTTP, FTP, SMTP, DNS. Socket Programming.	12	14
Unit 3	Transport Layer – UDP, TCP, Congestion Control.	12	14
Unit 4	Network Layer and Routing – routing algorithms in brief, Link Layer and LAN – LAN address and ARP, Ethernet, PPP.	12	14
Unit 5	Computer Network Security, Network Management.	12	14

Break up of Continuous internal Evaluation:

1. Assignment 05 Marks
 2. Seminar 05 Marks
 3. Test 20 Marks
- Total Marks: 30 Marks**

Reference Books:

1. Kurose J.F. & Ross K.W., "Computer Networking - A Top-Down Approach Featuring the Internet," 3rd Ed., Pearson Education.
1. Unix Network Programming – Volume 1: Richard Stevens, Pearson Education.
2. Keshav S., "An Engineering Approach to Computer Networks," AWL-ISE, 1999.
3. Bertsekas, Galager, "Data Networks," 2nd Ed., PHI, 1992.
4. Tanenbaum A.S., "Computer Networks," 3rd Ed, PHI, 1997.
5. Walrand J, "Communication Networks: A First Course," 2nd Ed, WCB/MH, 1998.



Paper No.: 10

Title of the Paper: **Software Engineering**

Credits: 5

Marks: 100

Marks: Semester End Examination: 70 Marks

Continuous Internal Evaluation: 30 Marks

Unit	Detailed Syllabus	Teaching Hour	Marks/Weight
Unit 1	Introduction Introduction to Software Engineering, Software(S/W), Nature of S/W., Software development cycles, Software Development Process models.	12	14
Unit 2	Software Requirement Specifications. Role of SRS, Problem Analysis, Requirement Specification, Verification & Validation.	12	14
Unit 3	Planning & Design of Software. Team Structure, Quality assurance plan, Unit development folder, Risk Management, System Design principles, Module level concepts, Coupling & Cohesion, Design Methodology, Structure Chart, Functional approach vs. Object oriented approach.	12	14
Unit 4	Coding & Testing. Programming Practice, Testing Fundamentals, Errors, Fault, Failure, Reliability, Levels of Testing, Test cases & Test criteria.	12	14
Unit 5	Case Study.	12	14

Break up of Continuous internal Evaluation:

1. Assignment 05 Marks
2. Seminar 05 Marks
3. Test 20 Marks

Total Marks: 30 Marks

Reference Books:

1. Jalote Pankaj: Integrated Approach to Software Engineering, Narosa Publication, 1991.
2. Pressman: Software Engineering, A Practice Approach, McGraw Hill Publication, 1987.
3. Fairley R. E.: Software Engineering, Concepts, McGraw Hill.
4. Senn, Analysis & Design of Information System, McGraw Hill Publication.
5. Lewis T G: Software Engineering, McGraw Hill Publication.



Paper No.: 11

Title of the Paper: **Internet & Scripting Languages**

Credits: 5

Marks: 100

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

Unit	Detailed Syllabus	Teaching Hour	Marks/Weight
Unit 1	Introduction. Internet – A network Of Networks, Types of Internet Connection-Dial Up & leased line, ISDN, broad band connectivity through DSL & WiMax, Various services available on internet, TCP/IP, FTP, Web Server, Web Site.	12	14
Unit 2	Internet Functions & Securities Concept of Web server & mail server, Intranet, applications in Internet & Intranet environment, Firewall, Virus, Cryptography.	12	14
Unit 3	Web Page Design through scripting (HTML) Document Layout, Header Elements, Block Oriented elements, Lists, Inline links, Hyperlinks, URL, Images, Forms, Tables, Special Characters.	12	14
Unit 4	Introduction to other Web Languages DHTML, XML, PHP, WML, CGI.	12	14
Unit 5	Animation in web page Flash Introduction & Screen Environment @ Basic Drawing & paintings. Use of Library. @ Animation in old Fashion. Motion Twin @ Graphic Symbol & Button Creation. Animated Gif Creation.	12	14

Break up of Continuous internal Evaluation:

- | | |
|---------------------|-----------------|
| 1. Assignment | 05 Marks |
| 2. Seminar | 05 Marks |
| 3. Test | <u>20 Marks</u> |
| Total Marks: | 30 Marks |

Reference Books:

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. Cistems, Internet An Introduction, Tata McGraw, Hill Pub. Co. Ltd.
4. Thomas Powell, Complete reference HTML, Osborne Computer Books.



Paper No.: 12

Title of the Paper: **Programming Lab-III**

Credits: 10

Marks: 100

Practical Based On

Unit	Detailed Syllabus	Teaching Hour	Marks/Weight
Unit 1	Paper 11: Internet & Scripting Languages	75	50
Unit 2	Visual Programming on .NET Platform: Getting Started with VB .NET, Concept of event handling, Creating forms in application Adding the controls to the form – Text Boxes, Rich Text Boxes, Labels & Link Labels, Other common controls – Buttons, Check Boxes, Radio Buttons, List Boxes, Combo Boxes, Scrollbars & Timers. Object Oriented Programming Classes & Objects, Fields, Properties, Methods & Events, Abstraction, Encapsulation, Inheritance & Polymorphism, Overloading, Overriding & shadowing, Constructors & Destructors. Web Application in VB .NET. Working with web forms and web form controls – Buttons, Text Boxes, Labels, Literals & Place Holders, Using other controls in Web form – Check Boxes, Radio Buttons, Labels, Panels, List Boxes, Hyper Links & Link Buttons, HTML Client controls & server controls. Database Access with ADO .NET. Accessing data with Server Explorer, Accessing data with Data Adaptors & Datasets, Working with ADO .NET.	75	50

Break up of Continuous internal Evaluation:

1. Assignment 05 Marks
 2. Seminar 05 Marks
 3. Test 20 Marks
- Total Marks: 30 Marks**

Reference Books:

1. Steven Holzner, Visual Basic .NET Programming Black Book DeramTech Press.
2. Professional VB .NET, Wrox Press Ltd.
3. Jeffrey Kent: Visual Basic .NET A Beginner's Guide, Tata McGraw-Hill Pub. Co. Ltd.



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SEMESTER – IV

Paper No.: 13

Title of the Paper: Advanced Database: Concepts & Tools

Credits: 5

Marks: 100

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

Unit	Detailed Syllabus	Teaching Hour	Marks/Weight
Unit 1	Database Concepts – Relational Database Models – Entity, Attributes, Primary Key, Table, View etc. – Entity Relationship Model – Unified Modeling Language (UML) – XML Databases – Data Analysis & OLAP – Data warehousing & mining	12	14
Unit 2	Overview of SQL & PL/SQL – Basic SQL Commands and functions. – Writing PL/SQL code - If then Else, cursor for Loop, – While Loop and Simple for Loop, Error handling. – Stored Procedures. – Functions. – Triggers.	12	14
Unit 3	Oracle Architecture – Physical & Logical database – Oracle instance – Database Structure & Space Management – Memory & Process Structure – Process Architecture	12	14
Unit 4	Database Security – Role & Privileges – Backup & Recovery – SQL *Loader Utility	12	14
Unit 5	Database Management on WEB – Introduction to WEB Application Server – Web Server Architecture – Data Publishing on WEB – Deploying database on WEB – Database Access(JDBC) – DB Access Protocol	12	14



Break up of Continuous internal Evaluation:

- | | |
|---------------|-----------------|
| 1. Assignment | 05 Marks |
| 2. Seminar | 05 Marks |
| 3. Test | <u>20 Marks</u> |

Total Marks: 30 Marks

Reference Books:

1. Oracle 9i The Complete Reference – Oracle Press
2. Oracle WEB Application Server Handbook – Oracle Press



Paper No.: 14

Title of the Paper: **Advanced Data Structures & Algorithms (Using C++)**

Credits: 5

Marks: 100

Marks: Semester End Examination: 70 Marks

Continuous Internal Evaluation: 30 Marks

Unit	Detailed Syllabus	Teaching Hour	Marks/Weight
Unit 1	Binary Tree & Applications – Binary Tree - Representation and traversal – Threaded Binary Tree – Huffman Algorithm – Representation of General Tree, General Tree Traversal, General expression as Tree, Evaluating an expression Tree	12	14
Unit 2	Advanced Searching – Tree Searching- Insertion & Deletion in Binary Search Tree – General search Trees – Multiway Search Tree – Representation, Searching & Traversing – B-Tree- Representation, Searching & Traversing – Introduction to B+-Tree	12	14
Unit 3	Divide and Conquer – The general method. – Binary search, Finding maximum, Minimum. – Merge sort, Quick sort.	12	14
Unit 4	Greedy method. – General method. – Knapsack Problem. – Job sequencing with deadlines. – Spanning trees. – Shortest paths.	12	14
Unit 5	Backtracking. – General method. – 8 queens problems. – Sum of subsets. – Graph colouring.	12	14

Break up of Continuous internal Evaluation:

1. Assignment 05 Marks
2. Seminar 05 Marks
3. Test 20 Marks

Total Marks: 30 Marks

Reference Books:

1. Data Structures Using C and C++- Y. Langsam, M.J.Augenstein, A.M. Tenenbaum
2. Fundamentals of Computer Algorithms- Horowitz Ellis & Sahni Sartaj Galgotia Pub. Pvt. Ltd., New Delhi.



Paper No.: 15

Title of the Paper: **Project Work**

Credits: 5

Marks: 100

Marks: Semester End Examination: 70 Marks

Continuous Internal Evaluation: 30 Marks

Unit	Detailed Syllabus	Teaching Hour	Marks/Weight
	<p>Students have to develop a software project based on any technologies they studied or not. The project should be in-house project (developed in the institute where they studied). In the exam, they have to show live running project to the examiners in the lab.</p> <p>Following parameters may be considered for evaluation:</p> <ul style="list-style-type: none"> ♣ Problem definition ♣ Quality of work ♣ Ability to modify the software ♣ Knowledge of application area ♣ Documentation ♣ Presentation 	120	70

Break up of Continuous internal Evaluation:

1. Assignment 05 Marks
2. Seminar 05 Marks
3. Test 20 Marks

Total Marks: 30 Marks

Reference Books:

1. Analysis and Design of Information Systems, McGraw Hill Intl. Std. Edn.

Paper No.: 16

Title of the Paper: **Programming Lab-IV**

Credits: 10

Marks: 100

Practical Based On

Unit	Detailed Syllabus	Teaching Hour	Marks/Weight
Unit 1	Paper 13: Advanced Database: Concepts & Tools	75	50
Unit 2	Paper 14: Advanced Data Structures & Algorithms (Using C++)	75	50



LIST OF COURSES PROPOSED TO BE OFFERED AS CHOICE BASED INTER DISCIPLINARY COURSES TO THE REGULAR STUDENTS REGISTERED IN OTHER PG DEPARTMENTS
(w.e.f. Academic Year commencing from June 2010)

Faculty: Science
Subject: Information Technology
PG Department: Department of Information Technology

Sr. No.	Semester	Course Title	Eligibility	Remarks
1	1ST	M.Sc. (I.T.) Paper 1: Computer System Organization	Graduate in any discipline with atleast 45 %	
2	1ST	M.Sc. (I.T.) Paper 2: Discrete Mathematics	Graduate in any discipline with atleast 45 %	
3	1ST	M.Sc. (I.T.) Paper 3: Data Structures and Algorithm	If having Credit of PGDCA 102 Computer Programming & Problem Solving	
4	2ND	M.Sc. (I.T.) Paper 5: Operating System	Graduate in any discipline with atleast 45 %	
5	2ND	M.Sc. (I.T.) Paper 6: Linear Algebra	Graduate in any discipline with atleast 45 %	
6	2ND	M.Sc. (I.T.) Paper 7: Data Base Management System	Graduate in any discipline with atleast 45 %	
7	3RD	M.Sc. (I.T.) Paper 9: Data Communication and Network	If having Credit of M.Sc. (I.T.) Paper 1 Computer System Organization	

* 60 Seats offered for any paper/s based on eligibility Merit

** Tuition fees for each paper: Rs. 3000/-