

**PROPOSED SCHEME FOR CHOICE BASED CREDIT SYSTEM IN  
BIT (BACHELOR OF INFORMATION TECHNOLOGY) PROGRAM from 2019**

| <b>B. Sc. Program<br/>(Computer<br/>Science)<br/>SEMESTER</b> | <b>CORE COURSE<br/>(12)</b>                    | <b>Ability<br/>Enhancement<br/>Compulsory<br/>Course (AECC)<br/>(4)</b> | <b>Skill<br/>Enhancement<br/>Course (SEC)<br/>(4)</b> | <b>Elective: Discipline<br/>Specific DSE (4)</b> |
|---|--|---|---|--|
| I SEMESTER  | Computer Fundamentals & information technology | Elementary Mathematics  | Communicative English                                 |  |
|   | Programming in C                               |   |   |  |
|   | Digital Electronics                            |   |   |  |
| II SEMESTER   | Operating System                               | Financial Accounting  | Discrete Mathematics                                  |  |
|   | Data Structure Using C                         |   |   |  |
|   | Web Technology and applications                |   |   |  |
| III SEMESTER  | OBJECT ORIENTED PROGRAMING WITH C++            | Computer Based Numerical Techniques                                     | Organizational Behaviour                              |  |
|   | Computer Networks                              |   |   |  |
|   | System Analysis And Design                     |   |   |  |
| IV SEMESTER   | JAVA   | Statistical tools and techniques  | Environmental Science                                 |  |
|   | Software Engineering                           |   |   |  |
|   | DBMS   |   |   |  |
| V SEMESTER  | python   | Optimization technique  |   | Data ware Housing & Data Mining                  |
|   | Wireless Computing                             |   |   | Computer Graphics                                |
|   | Cryptography and n/w security                  |   |   | C#.Net   |
| VI SEMESTER   | Project  | Computer Organiza & Architecture  | Multimedia  | Automata Theory                                  |
|   |  |   |   | E-commerce                                       |
|   |  |   |   | Artificial intelligence                          |

**Study & Evaluation Scheme BIT  
Semester-I**

| S. NO.       | Category(Core & Non Core) | Course Code | Subject Name                                   | Periods   |          |          | Credits   | Evaluation scheme |            |            |
|--------------|---------------------------|-------------|--|-----------|----------|----------|-----------|-------------------|------------|------------|
|              |                           |             |  | L         | T        | P        |           | INTERNAL          | EXTERNAL   | TOTAL      |
| 1.           | CORE                      | BIT-101     | Computer Fundamentals & information technology | 4         | 1        | 0        | 5         | 30                | 70         | 100        |
| 2.           | CORE                      | BIT-102     | Programming in C                               | 4         | 1        | 0        | 5         | 30                | 70         | 100        |
| 3.           | CORE                      | BIT-103     | Digital Electronics                            | 4         | 1        | 0        | 5         | 30                | 70         | 100        |
| 4.           | NON CORE (AECC)           | BIT-104     | Elementary Mathematics                         | 3         | 1        | 0        | 4         | 30                | 70         | 100        |
| 5.           | NON CORE (SEC)            | BIT-105     | Communicative English                          | 3         | 1        | 0        | 4         | 30                | 70         | 100        |
| 6.           | NON CORE                  | BIT-106     | Practical 1 (Based on BIT-101)                 | 0         | 0        | 4        | 2         | 50                | 50         | 100        |
| 7.           | CORE                      | BIT-107     | Practical 2 (Based on BIT-102)                 | 0         | 0        | 4        | 2         | 50                | 50         | 100        |
| <b>TOTAL</b> |                           |             |  | <b>18</b> | <b>5</b> | <b>8</b> | <b>27</b> | <b>250</b>        | <b>450</b> | <b>700</b> |

## Study & Evaluation Scheme BIT

### Semester-II

| S. NO.       | Category<br>(Core<br>&Non<br>Core) | Course<br>Code | Subject<br>Name                          | Periods   |          |          | Credi<br>ts | Evaluation scheme |              |            |
|--------------|------------------------------------|----------------|--|-----------|----------|----------|-------------|-------------------|--------------|------------|
|              |                                    |                |  | L         | T        | P        |             | INTER<br>NAL      | EXTER<br>NAL | TOT<br>AL  |
| 1.           | CORE                               | BIT-201        | Operating<br>System                      | 4         | 1        | 0        | 5           | 30                | 70           | 100        |
| 2.           | CORE                               | BIT-202        | Data<br>Structure<br>Using C             | 4         | 1        | 0        | 5           | 30                | 70           | 100        |
| 3.           | CORE                               | BIT-203        | Web<br>Technology<br>and<br>applications | 4         | 1        | 0        | 5           | 30                | 70           | 100        |
| 4.           | NON<br>CORE<br>(AECC)              | BIT-204        | Financial<br>Accounting                  | 3         | 1        | 0        | 4           | 30                | 70           | 100        |
| 5.           | NON<br>CORE<br>(SEC)               | BIT-205        | Discrete<br>Mathematics                  | 3         | 1        | 0        | 4           | 30                | 70           | 100        |
| 6.           | NON<br>CORE                        | BIT-206        | Practical 1<br>(Based on<br>BIT- 202)    | 0         | 0        | 4        | 2           | 50                | 50           | 100        |
| 7.           | CORE                               | BIT-207        | Practical 2<br>(Based on<br>BIT-203)     | 0         | 0        | 4        | 2           | 50                | 50           | 100        |
| <b>TOTAL</b> |                                    |                |  | <b>18</b> | <b>5</b> | <b>8</b> | <b>27</b>   | <b>250</b>        | <b>450</b>   | <b>700</b> |

**Study & Evaluation Scheme BIT  
Semester-III**

| S. NO.       | Category(Core & Non Core) | Course Code | Subject Name                         | Periods   |          |          | Credits   | Evaluation scheme |            |            |
|--------------|---------------------------|-------------|--------------------------------------|-----------|----------|----------|-----------|-------------------|------------|------------|
|              |                           |             |                                      | L         | T        | P        |           | INTERNAL          | EXTERNAL   | TOTAL      |
| 1.           | CORE                      | BIT-301     | Object Oriented Programming with C++ | 4         | 1        | 0        | 5         | 30                | 70         | 100        |
| 2.           | CORE                      | BIT-302     | Computer Networks                    | 4         | 1        | 0        | 5         | 30                | 70         | 100        |
| 3.           | CORE                      | BIT-303     | System Analysis And Design           | 4         | 1        | 0        | 5         | 30                | 70         | 100        |
| 4.           | NON CORE (AECC)           | BIT-304     | Computer Based Numerical Technique   | 3         | 1        | 0        | 4         | 30                | 70         | 100        |
| 5.           | NON CORE (SEC)            | BIT-305     | Organizational Behavior              | 3         | 1        | 0        | 4         | 30                | 70         | 100        |
| 6.           | NON CORE                  | BIT-306     | Practical 1 (Based on BIT- 301)      | 0         | 0        | 4        | 2         | 50                | 50         | 100        |
| 7.           | CORE                      | BIT-307     | Practical 2 (Based on BIT-304)       | 0         | 0        | 4        | 2         | 50                | 50         | 100        |
| <b>TOTAL</b> |                           |             |                                      | <b>18</b> | <b>5</b> | <b>8</b> | <b>27</b> | <b>250</b>        | <b>450</b> | <b>700</b> |

**Study & Evaluation Scheme BIT  
Semester-IV**

| S. NO.       | Category (Core & Non Core) | Course Code | Subject Name                     | Periods   |          |          | Credits   | Evaluation scheme |            |            |
|--------------|----------------------------|-------------|----------------------------------|-----------|----------|----------|-----------|-------------------|------------|------------|
|              |                            |             |                                  | L         | T        | P        |           | INTERNAL          | EXTERNAL   | TOTAL      |
| 1            | CORE                       | BIT-401     | JAVA                             | 4         | 1        | 0        | 5         | 30                | 70         | 100        |
| 2            | CORE                       | BIT-402     | Software Engineering             | 4         | 1        | 0        | 5         | 30                | 70         | 100        |
| 3            | CORE                       | BIT-403     | DBMS                             | 4         | 1        | 0        | 5         | 30                | 70         | 100        |
| 4            | NON CORE (AECC)            | BIT-404     | Statistical Tools and Techniques | 3         | 1        | 0        | 4         | 30                | 70         | 100        |
| 5            | NON CORE (SEC)             | BIT-405     | Environmental Science            | 3         | 1        | 0        | 4         | 30                | 70         | 100        |
| 6            | NON CORE                   | BIT-406     | Practical 1 (Based on BIT- 401)  | 0         | 0        | 4        | 2         | 50                | 50         | 100        |
| 7            | CORE                       | BIT-407     | Practical 2 (Based on BIT-403)   | 0         | 0        | 4        | 2         | 50                | 50         | 100        |
| <b>TOTAL</b> |                            |             |                                  | <b>18</b> | <b>5</b> | <b>8</b> | <b>27</b> | <b>250</b>        | <b>450</b> | <b>700</b> |

**Study & Evaluation Scheme BIT  
Semester-V**

| S. NO.       | Category (Core & Non Core) | Course Code | Subject Name  | Periods   |          |          | Credits   | Evaluation scheme |            |            |
|--------------|----------------------------|-------------|---|-----------|----------|----------|-----------|-------------------|------------|------------|
|              |                            |             |   | L         | T        | P        |           | INTERNAL          | EXTERNAL   | TOTAL      |
| 1.           | CORE                       | BIT-501     | python  | 4         | 1        | 0        | 5         | 30                | 70         | 100        |
| 2.           | CORE                       | BIT-502     | Wireless Computing  | 4         | 1        | 0        | 5         | 30                | 70         | 100        |
| 3.           | CORE                       | BIT-503     | Cryptography and n/w security                             | 4         | 1        | 0        | 5         | 30                | 70         | 100        |
| 4.           | NON CORE (AECC)            | BIT-504     | Optimization technique                                    | 3         | 1        | 0        | 4         | 30                | 70         | 100        |
| 5.           | NON CORE (SEC)             | BIT-505     | Dataware Housing & Data Mining/ Computer Graphics/ C#.Net | 3         | 1        | 0        | 4         | 30                | 70         | 100        |
| 6.           | CORE                       | BIT-506     | Practical 1 (Based on BIT- 501)                           | 0         | 0        | 4        | 2         | 50                | 50         | 100        |
| 7.           | NON CORE (SEC)             | BIT-507     | Practical 2 (Based on BIT-504)                            | 0         | 0        | 4        | 2         | 50                | 50         | 100        |
| <b>TOTAL</b> |                            |             |   | <b>18</b> | <b>5</b> | <b>8</b> | <b>27</b> | <b>250</b>        | <b>450</b> | <b>700</b> |

**Study & Evaluation Scheme BIT  
Semester-VI**

| S. NO.       | Category (Core & Non Core) | Course Code | Subject Name   | Periods   |          |           | Credits   | Evaluation scheme |            |            |
|--------------|----------------------------|-------------|--|-----------|----------|-----------|-----------|-------------------|------------|------------|
|              |                            |             |  | L         | T        | P         |           | INTERNAL          | EXTERNAL   | TOTAL      |
| 1.           | CORE                       | BIT-601     | Project Work   | 0         | 0        | 8         | 4         | 100               | 200        | 300        |
| 2.           | CORE                       | BIT-602     | Computer Organization and Architecture               | 4         | 1        | 0         | 5         | 30                | 70         | 100        |
| 3.           | CORE                       | BIT-603     | Multimedia   | 4         | 1        | 0         | 5         | 30                | 70         | 100        |
| 4.           | NON CORE (DSE)             | BIT-604     | Automata Theory/ E-commerce/ Artificial intelligence | 3         | 1        | 0         | 4         | 30                | 70         | 100        |
| 5.           | CORE                       | BIT-605     | Practical based on 603                               | 0         | 0        | 4         | 2         | 30                | 70         | 100        |
| <b>TOTAL</b> |                            |             |  | <b>11</b> | <b>3</b> | <b>12</b> | <b>20</b> | <b>220</b>        | <b>480</b> | <b>700</b> |

## FIRST SEMESTER

### BIT (BACHELOR OF INFORMATION TECHNOLOGY)

**1. COURSE NUMBER : BIT-101**

**2. NAME OF COURSE : Computer Fundamentals & Information Technology**

**3. CREDIT HOURS : 5(3-2-0)**

1. Fundamentals of Computers-Classification of Computers Input & Output Devices ,limitations generation ,challenges Overview of Computer Hardware & Software Memory. EBCDIC,UNIVAS ,ASCII ,PASCAL COMPUTER
2. What is an operating system, Types of Operating System with examples, Single user (MS-DOS) and Multiuser (UNIX), Functions of Operating System, Memo,Internal external command , Introduction to Windows XP, Parts of Windows Screen- Desktop Icons. Windows, Anatomy of a Window, The Title Bar, Minimize and Maximize Button. The Control Box, Scroll Bars, Scroll Buttons and Scroll Boxes, Changing Screen Saver and Background Application and Document Windows, Changing Date and Time. My Computer, My Documents, Recycle Bin, Creating Folder, Windows Explorer, Searching, Moving Files, Copy, Delete and Rename Files, Creating Shortcuts.
3. INFORMATION CONCEPT & PROCESSING – Definition of information, need for information, quality of information, value of information, categories and levels of information in business organization.
4. PROGRAMMING LANGUAGE CLASSIFICATION-Computer languages, generation of languages, translators-interpreters, compilers, assembles, introduction to 4gls.
5. INFORMATION TECHNOLOGY APPLICATION IN INDIA-Scientific business, education and entertainment application, industry automation, weather forecasting , media for data transmission, types of networking, client server architecture.NICNET, ERNET etc.

#### REFERENCE BOOKS-

1. Introduction to information technology, ITL education solution limited, personal education.
2. Introduction to computer science, ITL Education solution limited. Personal education.
3. Foundation of information technology by D S Yadav . New age publication ltd.
4. Introduction to computer by peter Norton TMH. Publication ltd

## FIRST SEMESTER

### BIT (BACHELOR OF INFORMATION TECHNOLOGY)

1. COURSE : BIT-102  
2. NAME OF COURSE : PROGRAMMING IN 'C'  
3. CREDIT HOURS : 5(4-1-0)

#### **1. C Fundamental**

Character set, identifiers and keywords, data types, constants, variables and arrays, declarations, operators **and** expressions, library functions, statements, symbolic constants, preprocessor directives, formatted input, output, basic data types, type conversion, data type modifiers, expressions and operators, precedence of C operators, Flow Charts.

#### **2. Control statements**

If, If-else, while, do-while, goto, for statements, nested Control

structures, switch, break, continue statements, comma operator,

types of loops.

#### **3. Function and macros**

Function prototypes, passing arguments to a function by value, recursion. Storage classes macros, header files, types of function.

#### **4. Arrays**

Defining- processing array, passing arrays to function, introduction to multidimensional arrays, arrays and strings.

#### **5. Pointers and structures**

Structures and unions, defining and processing a structure.

#### **Reference Books-**

1. The c programming language by Kernighan & Ritchie, PHI
2. Let us c by Yashawant kanetkar, BPB publication, New Delhi.
3. Computer & data processing with basic by Emdad H . Khan & Anil k. Sharma.
4. Programming in ANSI C Ram Kumar & Rakesh Agrawai tata Me Graw-hill publishing company limited.
5. Mastering turbo c by stan Kelly – bottle , BPB Publication, New Delhi.
6. Programming in c by Dennis Ritchie , BPB Publication , New Delhi.

## FIRST SEMESTER

### BIT (BACHELOR OF INFORMATION TECHNOLOGY)

- 1. COURSE NUMBER : BIT-103**
- 2. NAME OF COURSE : DIGITAL ELECTRONICS**
- 3. CREDIT HOURS : 4(3 - 1 - 0)**

- 1. Introduction-** Number system, Conversion from one number system to another number system, Binary operations -1's & 2's complements addition, subtraction, multiplication, division and other operation.
- 2. Logic gates-** AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR, various TTL & CMOS logic gates, Electronic components in digital systems - Diode switching, transistor as switching elements, digital signals & basic circuits.
- 3. Parameters of TTL & CMOS circuits-** Power dissipation, noise immunity, loading & delays etc.
- 4. Boolean Algebra-** Theorems, operation, logic expressions, rule & laws, DeMorgan's theorem, Simplification.
- 5. Combinational Logic circuit-**Function representation- Standard, non-standard and canonical representation of logic functions, minterms, maxterms, SOP, POS, function representation etc. Minimization-Karnaugh map method, Quine McCluskey (tabular) method, search techniques.
- 6. Combinational Circuit And Circuit Design-** Half & full adders and subtractors, analysis and design of combinational logic circuit, use of AND,OR,NOR/NAND(universal gates),Ex-OR, Ex-NOR,NOT gates in digital circuit, seven segment displays, decoder, encoder, multiplexer, demultiplexer, parity generators/checkers, magnitude comparator, function realization using multiplexer and decoders: other examples of practical combinational circuits, ROMs, ALU.
- 7. Sequential Circuits-** Introduction to sequential circuits (asynchronous & synchronous),concept of memory, latches & various flip-flops-D,T, RS, JK, master- slave,

data-lockout etc., method of edge triggering and clocked applications, various implementations of latches & flip-flop, Introduction to counters, shift registers, astable and monostable multivibrators, practical sequential circuits and their application including 555 timers IC.

#### **Reference Books-**

1. Digital circuits and logic design by Samuel C Lee, prentice hall of India (PHI) private limited, New Delhi.
2. Digital logic and computer design by M Morris Mano, prentice hall of India (PHI) private limited, New Delhi.

## FIRST SEMESTER

### BIT (BACHELORE OF INFORMATION TECHNOLOGY)

- 1. COURSE NUMBER : BIT-104**
- 2. NAME OF COURSE : ELEMENTARY MATHEMATICAL**
- 3. CREDIT HOURS : 4(3-1-0)**

1. Permutation & combination binomial & simple problems based on it.
2. Binomial & simple problem.
3. Logarithmic and Exponential series.
4. Probability.
5. Introduction to coordinated plane.
6. Distance between two points..
7. Section formula i.e. co-ordinates of a division of straight line joining two point
8. Equation of straight lines.
9. Area of Triangle.
10. Pair of straight line of the form ax.
11. Circle different form of Equation.
12. Tangent to the circle condition of tangency.
13. Parabola.
14. Ellipse.
15. Hyperbola.

#### **Reference Books-**

1. Higher Algebra by Hall & Knight.
2. Senior secondary school Mathematics by R.S. Agrawal.
3. Co-ordinate Geometry by Manjeet Singh.

## FIRST SEMESTER

### BIT (BACHELOR OF INFORMATION TECHNOLOGY)

1. COURSE NUMBER : BIT-105  
2. NAME OF COURSE : COMMUNICATIVE ENGLISH  
3. CREDIT HOURS : 4(3-1-0)

**Unit 1. English Grammar:** Use of articles, preposition & tenses.

**Unit 2. Communication:** oral communication conversation business letters, pronunciation & transcription words.

**Unit 3. Presentation skills:** précis writing, essay writing, presentation skills related to seminars and conferences.

#### **Reference books-**

1. Wren, P.C.& Martin, H: "English grammar:&composition", S. Chand
2. T. Seth. Agarwal "The art of English grammar & composition, Retan Prekeshan, Agra.
3. Sinha K K "Business Communication", Galgotia.
4. W.E.Allen "living English structure"
5. "Business Communication", Irwin Mc Graw hill.

## SECOND SEMESTER

### BIT (BACHELOR OF INFORMATION TECHNOLOGY)

1. **COURSE NUMBER** : **BIT-201**  
2. **NAME OF COURSE** : **OPERATING SYSTEM**  
3. **CREDIT HOURS** : **5(4-1-0)**

1. **Operating System:** definition, simple batch system, Time sharing system, Real time system , storage Hierarchy, operating system service, System Calls.
2. **Process:** Process concept, process Scheduling, operating on process, co-operating process.
3. **CPU:** Scheduling concepts, Scheduling algorithms, process synchronization, critical section problem, synchronization hardware, semaphores, Two Level Scheduling.
4. **Deadlocks:** deadlock characterization, deadlock prevention, avoidance detection and recovery.
5. Storage management , Resident monitor , Logical versus physical address space, swapping and segmentation.
6. **Virtual Memory:** Virtual memory, Demand paging, page replacement and page replacement algorithms, allocation of frames, thrashing.
7. **File system:** File supports , access methods, allocation methods-contiguous, linked and index allocation, directory system – single level, tree structured, acyclic graph and general graph directory, file protection, File Basis.
8. **Secondary storage structure:** Disk structures, disk scheduling, disk management, allocation methods, free space management, security management, Security, Protection Management.
9. **Case study of the UNIX system:** design principles, programmer and user interface, process, memory and file management, process Management.

#### **Reference Books-**

1. Silberschatz galvin :Operating System Concepts
2. Tanenbaum A.S. :Modern Operating system, (PHI) 1998
3. Growley :Operating system a design Approach

**SECOND SEMESTER**  
**BIT (BACHELOR OF INFORMATION TECHNOLOGY)**

- 1. COURSE NUMBER : BIT-202**  
**2. NAME OF COURSE : INTRODUCTION TO DATA STRUCTURE**  
**3. CREDIT HOURS : 5(4 – 1 – 0)**

- 1. Introduction and Definition of Data Structure:** Basic terminology, Data structure, operations, Algorithms, algorithm complexities, mathematical notations of algorithm.
- 2. Arrays, Records and Pointers:** Introduction, Linear Arrays, Representations of Linear Arrays in Memory, Traversing Linear Arrays, Inserting and Deleting, Sorting, Bubble Sort, Searching, Linear Search, Binary Search, Multidimensional Arrays, Pointers, Pointers Arrays, Declarations, referencing and de- referencing, passing pointers to functions, pointer to array, operations on file using pointers, concept of dynamic allocation of memory, linked list, Records; Records Structures, Representation of Records in Memory; Parallel Arrays, Matrices, Sparse Matrices.
- 3. Linked Lists:** Introduction, Linked Lists, Representation of Linked Lists in Memory, Traversing a Linked List, Searching a Linked List, Memory Allocation; Garbage Collection, Insertion into a Linked List, Deletion from a Linked List, Header Linked Lists, Two-Way Lists, Insertion in a Linked lists.
- 4. Stacks, Queues, Recursion:** Introduction, Stacks, Array Representation of Stacks, Arithmetic Expressions; Polish Notation, Quick sort, an Application of Stacks, Recursion, Towers of Hanoi, Implementation of Recursive Procedures of Stacks, Queues, Deques, Priority Queues, Double Ended Queue.
- 5. Trees:** Introduction, Binary Trees, Representing Binary Trees in Memory, Application of Binary Tree, Traversing Algorithms Using Stacks, Header Nodes; Threads, Binary Search Trees, Searching and Inserting in Binary Search Trees Deleting in Binary Search Tree, Heap; Heap Sort, Path Lengths; Huffman’s Algorithm, General Trees.
- 6. Sorting and Searching:** Introduction, Sorting, Insertion Sort, Selection Sort, Merging, Bubble Sort, Merge-Sort, Radix Sort, Linear & Binary Search, Searching and Data Modification, Hashing.

**Reference Books**

1. Theory and Problems of Data Structures by Seymour Lipschutz, McGRAW-Hill Publication Ltd., New Delhi
2. Data Structures & Program Design in “C” by Rober L Kruse, Bruce & P. Leung & Clovis, L. Tondo, Prentice Hall-Publication, New Delhi.
3. Expert Data Structures with C by R. B. Patel Khanna Book Publication Co. (P) Ltd.



## SECOND SEMESTER

### BIT (BACHELOR OF INFORMATION TECHNOLOGY)

1. **COURSE NUMBER :** BIT – 203
2. **NAME OF COURSE :** WEB DESIGNING & APPLICATIONS
3. **CREDIT HOURS :** 5( 4-1- 0)

#### **Unit I**

History of the web, Growth of the web, Protocols governing the web, Introduction to cyber laws in India. Introduction to International Cyber laws, Web project, Web tea, team dynamics.

#### **Unit II**

Communication Issues, the client, Multi-departmental and large scale websites, quality Insurance and testing, technological advances and impact no web teams.

#### **Unit III**

**HTML:** Formatting, tags, links tables, frames, forms, comments in HTML, DHTML.

**Java Script:** Introduction, Documents, forms, Statements, Functions, Objects in Java scripts, events and event handling, arrays, FORMS, Button, Checkboxes, Text fields and text areas.

#### **Unit IV**

**XML:** Introduction, displaying an XML Document, Data interchanges with an XML Document, Document type definition, Parsers using XML, Client-side usage, Server-side Usage.

#### **Unit V**

Common gateway interface (CGI), PERL, RMI, COM/DCOM, VBScript, Active server Pages (ASP).

#### **Reference Books-**

1. Burdman, “Collaborative Web Development”, Addison Wesley.
2. Sharma & Sharma, “Developing E-Commerce Sites”, Addison Wesley.
3. Ivan Bayross, “Web Technologies Part II”, BPB Publications.
4. Shishir Gundavarma, “CGI Programming on the World Wide Web”, O’Reilly & Associate.
5. DON Box, “Essential COM”, Addison Wesley.
6. Greg Buczek, “ASP Developer’s Guide”, TMH.

## SECOND SEMESTER

### BIT (Bachelor of Information Technology)

1. COURSE NUMBER : BIT-204
2. NAME OF COURSE : FINANCIAL ACCOUNTING
3. CREDIT HOURS : 4(3-1-0)

**1. Introduction :**

Conceptual framework, double entry system of accounting, introduction of basic books of account, control for debtors & creditors, closing of books of accounts. Importance of Accounting.

**2. Final accounts :**

Trading, profit & loss account, balance sheet, introduction to manufacturing account of partnership firms, limited company.

**3. Financial management :**

Meaning and roll

**4. Ratio analysis :**

Meaning, advantage, limitation, type of ratio & their usefulness.

**5. Fund flow statement :**

Meaning of the terms, fund, flow of fund, working capital cycle, preparation & interpretation of fund flow statement.

**6. Costing :**

Nature, importance & basic principles, rules of books keeping.

**Reference books –**

1. Kellock, "Elements of accounting," Heinemann
2. Levy & Sranat, "Principles of financial managements," PHI
3. Anathony RN, "Fundamental of Management accounting prospects"
4. Bhattacharaya & Deardon, "Accounting of Management test & cases", Vikas publishing.

## SECOND SEMESTER

### BIT (Bachelor of Information Technology)

1. **Course number** : **BIT-205**
2. **Name of course** : **Discrete Mathematics**
3. **Credit Hours** : **4(3– 1– 0)**

**Unit - I** Propositional Calculus: Propositions, Truth tables, Logical Equivalence, Logical implications, Algebra of propositions, Conditional propositions, Bi-conditional statements, Negation of Compound statements, Tautologies and Contradiction, Normal Form, Arguments, Fallacies.

**Unit - II** Boolean algebra and Circuits: Boolean Expression, Logic Gates, Logic Circuits, Boolean Functions, Sum of Product and Product of Sum Forms, Canonical Forms, Simplification of functions using K-Map.

**Unit - III** Set Theory: Basic concepts of Set theory, some operations on sets, Venn diagram, Basic Set identities, Cartesian product. Relation: Definition, Types of relation, Pictorial representation of relation, Composition of Relation, Equivalence relation. Function: Definition, Classification of function, Types of function (one to one, many to one, into, onto, objective), Composition of function, Inverse function, Identity function.

**Unit - IV** Combinatorics: Fundamental principles, Permutation and Combination, Recurrence Relation.

**Unit - V** Graphs and Trees: Introduction to graphs, Graph terminology, Application of Graphs, Finite and Infinite graphs, Incidence and Degree, Isolated vertex, Pendent Vertex, and Null graph.

Text Books: 1. Sarkar Swapan Kumar, Discrete Mathematics , S Chand 2. NarsinghDeo, Graph Theory with Applications to Engineering and Comp. Science , Prentice Hall of India. 3. Seymour Lipschutz & Marc Lipson, Discrete Mathematics , Tata McGraw Hill.

Reference Books: 1. Liu C.L., Elements of Discrete Mathematics, TMH. 2. Neville Dean, Essence of Discrete Mathematics , Prentice Hall. 3. Kenneth H. Rosen, Discrete Mathematics and Its Applications , McGraw Hill. 4. Richard Johnsonbaugh, Discrete Mathematics , Macmillan.

## THIRD SEMESTER

### BIT (Bachelor of Information Technology)

1. **Course Number** : BIT-301
2. **Name of Course** : Object Oriented Programming with C++
3. **Credit Hours** : 5(4-1-0)

**Unit I:** Principles of Object Oriented Programming: Procedure Oriented Programming – OOP Paradigm- Basic concepts of OOP-Benefits of OOP-Object Oriented Language Applications of OOP. Beginning with C++, Tokens, Expressions and Control Structure. Functions in C++: Introduction-Main function prototyping-call by, return by reference inline functions-default, constant arguments-Function overloading-friend and virtual functions.

**Unit II:** Classes and Objects. Constructors and Destructors. Constructors-Parameterized, Multiple Constructors-constructors with default arguments-Dynamic initialization of objects-copy, dynamic constructors- destructors.

**Unit-III:** Operator overloading and Type Conversions, Inheritance: Extending classes. Pointers, virtual functions and polymorphism, Managing console I/O Operations:

**Unit-IV :** C++ streams-C++ stream classes-Unformatted I/O Operations-Formatted console I/O Operations, Working with files: classes for file stream operations-opening and closing a file-EOF-File modes-File pointers-sequential I/O Operations

**Unit-V :** Templates, Exception Handling.

**Text Books:** 1. Lafore R., Object Oriented Programming using C++ , Galgotia. 2. Venugopal A.R. & Rajkumar, T. Ravishanker, Mastering C++ , Tata McGraw Hill. 3. Lippman S. B. & Lajoie J., C++ Primer , Addison Wesley.

**Reference Books:** 1. Parsons D., Object Oriented Programming with C++ , BPB Publication. 2. Steven C. Lawlor, The Art of Programming Computer Science with C++ , Vikas Publication. 3. Schildt Herbert, C++: The Complete Reference , Tata McGraw Hill. 4. Tony Gaddis, Watters, Muganda, Object-Oriented Programming in C++ , Dreamtech.

### THIRD SEMESTER

#### BIT (Bachelor of Information Technology)

**Course Number** : BIT-302

**Name of Course** : Computer Networks

**Credit Hours** : 4(4 – 1 – 0)

**Introduction to Computer Networking:** Use, advantages, structure of the communication networks, analog to digital communication, Layered Protocols, Network & the OSI Models, Wide area and local area networks, connection oriented and connectionless networks, Narrow Band & Broad Band, ISDN.

**TCP/IP: and Internetworking:** example of TCP/IP operations, related protocols ports and sockets. The IP address structure, major features of IP, IP datagram, Major IP services. IP source routing, value of the transport layer, TCP, Major features of TCP, passive and active operation, transmission control protocols (TCP), route discovery protocols, examples of route discovery protocols, application layer protocols, IPv6, Ethernet.

#### **Reference Books-**

Tanenbaum, A.S.: Computer Network, PHI-1985.

Martin J: Computer Network and Distributed processing, 1985.

Black: Computer Network; protocols, Standards and Interface PHI-1985.

Black: data Network; Concepts, Theory and practices, PHI.

Starlings, William: Local Networks; and Introduction Mack Publishing Co.

Corner; Internetnetworking: Principles, protocols Architecture, PHI with TCP.IP

## THIRD SEMESTER

### BIT (Bachelor of Information Technology)

|                          |          |                                     |
|--------------------------|----------|-------------------------------------|
| <b>1. Course Name</b>    | <b>:</b> | <b>BIT-303</b>                      |
| <b>2. Name of Course</b> | <b>:</b> | <b>System Analysis &amp; Design</b> |
| <b>3. Credit Hours</b>   | <b>:</b> | <b>5(4-1-0)</b>                     |

**1. System Concepts and Information System environment:** The System concept, Definition, Characteristics of System, Element of a system, open and closed system, formal & informal Information systems, Computer based Information System, Management Information System, Decision Support system, general Business Knowledge, and Interpersonal Communication System

**2. The System Development Life Cycle:** Recognition of needs, Impetus for system change, feasibility study, analysis, design, implementation, post implementation & maintenance.

**3. The Role of the system analyst:** historical perspective, academic & personal qualification, the multifaceted role of the analyst, the analyst/ user interface, behavioral issues.

**4. System planning & Initial Investigation:** Strategies for determining information requirement, problem definition & project initiation, background analysis, fact analysis, review of written documents, onsite observations, interviews & questionnaires, fact analysis, performance analysis, Efficiency analysis, service analysis.

**5. Information Gathering:** Kind of information needed, Information about the firms, information gathering tools, the art of interviewing, arranging the interview, guides to successful interview, types of interviews and questionnaires, the structured and unstructured alternatives.

**6. The Tools of structured analysis:** the dataflow diagram {DFD}, Data Dictionary, Decision trees and structure English.

**7. Feasibility Study:** System performance, Economic feasibility, technical feasibility, Behavioral Feasibility, steps in feasibility analysis,

**8. Input/ Output and forms design:** Input design, CRT Screen Design, Output Design, Requirement form design.

### **References Books-**

1. Elias.M.Award, "Systems Analysis & Design" Galgotia publication.
2. Hoffer, "Modern Systems Analysis & Design" Addison Wesley
3. Kendall, "Introduction to System Analysis & Design", McGraw Hill

## THIRD SEMESTER

### BIT(Bachelor of Information Technology)

1. **Course Number** :BIT-304
2. **Name of Course** :Computer Based Numerical Techniques
3. **Credit Hours** : 4(3-1-0)

1. **Floating Point Arithmetic:** Representation of Floating Point Numbers , Operation , Normalization, Pitfalls of floating point representation, Errors in numerical computation.

2. **Iterative Methods:** Zeros of single transcendental equation and Zeros of polynomial using Bisection Method, Iteration Method, Regula- Falsi Method, Newton Raphson method, Secant Method, Rate of convergence of iterative method.

3. **Simulation Linear Equation:** Solution of system of Linear equation, Gauss Elimination direct method and pivoting , Ill conditioned system of equation , refinement of solution, Gauss seidal iterative method, Rate of Convergence.

4. **Interpolation and approximation:** Finite differences, Difference tables, Polynomial Interpolation: Newton's forward and backward formula, Central Differences formulae: Gauss forward and backward formula, Stirling's, Bessel's, Everett's formula. Interpolation with unequal intervals: Lagrange's Interpolation, Newton Divided difference formula.

5. **Numerical Differentiation and Integration:** Introduction, Numerical Differentiation , Numerical Integration, Trapezoidal rule, Simpson's rule, Boole's Rule Euler Maclaurin formulas , Solution of Differentiation Equation: Picard's method, Euler's Method, Taylor's Method, Runge- Kutta method.

#### **Reference Books-**

1. Rajaraman V; : "Computer Oriented Numerical Methods" PHI
2. Gerald and Wheatley, "Applied Numerical Analysis" ,AW
3. Jain, Lyengar and Jain, Numerical Methods for Scientific and Engineering Computation , New Ager Int.
4. Grewal B.S., "Numerical methods in Engineering and Science. Khanna Publishers", Delhi.
5. T.Veeraranjan, T.Ramchandran, "Theory and Problems of Numerical Methods".

**THIRD SEMESTER**  
**BIT(Bachelor of Information Technology)**

1. **Course Number** : **BIT-305**  
2. **Name of Course** : **Organizational Behavior**  
3. **Credit Hours** : **4(3-1-0)**

1. **Individual Differences at work:** Personality, attitude and intelligence.
2. **Motivation:** Importance of motivation in work behavior approaches to motivation, content theories, and process theories.
3. **Job analysis and Design:** Approaches, job enlargement, job design models.
4. **Communication:** Types, transaction analysis, Johari windows.
5. **Training and Development:** Training needs assessment, training techniques and training evaluation.
6. **Organization Power, Politics and Conflict:** Types, sources, conflict coping strategies.
7. **Leadership:** Styles, theories and models.
8. **Performance Appraisal:** Need, methods and applications.

**Reference Books-**

1. S.P. Robins, Organizational Behaviour Concepts, Controversies and Application (8<sup>th</sup> Ed.) 2000.
2. N.K. Chadha, Human Resources Management 2000, Sai New Delhi Printographers.
3. F. Luthans, Organizational Behaviour, Tata McGraw Hill.

## **FOURTH SEMESTER**

### **BIT(Bachelor of Information Technology)**

1. **Course Number** : **BIT-401**
2. **Name of Course** : **JAVA Programming**
3. **Credit Hours** : **5(4-1-0)**

#### **Unit I:**

Introduction to Java Procedure Vs Object oriented Programming with reference to OOPS principles, History of Java, Java features, JDK, JVM, Hello world program in Java, Compilation Using Java and execution using Java.

#### **Unit II:**

Data types, Tokens in java Tokens of Java, Data types in Java with size and range, simple, floating, Boolean etc. Type conversions, Type casting, declaring variables, Arrays in Java Simple programs in Java base on variables and constants.

#### **Unit III:**

Java Operators Arithmetic Operators, Relational, Logical, Bitwise, Boolean operators and their use in Java programs.

Control Statement in Java Loops(for, while, do- while), Decision making statement(If- then- end if), nested If, Nested Loops, Switch- case and sample programs .

#### **Unit IV:**

Object Oriented Programming In Java Concept of Class and objects in java, Java Class creation, scope Identifiers, java methods, object and use of methods by objects, sample class based programs in java, method overloading in Java, Abstract class and it's use, java Constructors.

#### **Unit V:**

Inheritance & Multithreading in Java Define Inheritance, Types of inheritance in Java and use in Programs, interface, Super class, Method overriding, Java Thread model, native methods of threads class. Implementation of threads in java, Simple Applet programming in Java.

Suggested Reading:

Java E. Balaguruswami

Java Complete Reference Peter Norton Java Black Book

## FOURTH SEMESTER

### BIT (Bachelor of Information Technology)

1. **Course Number** : **BIT-402**
2. **Name of Course** : **Software engineering**
3. **Credit Hours** : **5(4-1-0)**

**1.Introduction:** Introduction to Software engineering, Importance of software evolving role of software, Software Characteristics, Software Components, Software Applications, Software Crisis, Software engineering problems, Software Development Life Cycle, Software Process.

**2. Software Requirement Specification:** Analysis, Principles, Water Fall Model, The Incremental Model, Prototyping, Spiral Model, Role of management in software development, Role of matrices and Measurement, Problem Analysis, COCOMO Model.

**3.Software- Design:** Design principles, problem partitioning, abstraction, top down and bottom up-design, structured approach functional versus object oriented approach, design specification and verification, Monitoring and control, Software Architecture, Transaction and Transaction and Transform Mapping, Component Level Design, Fourth Generation Techniques.

**4. Coding:** Top-Down and Bottom-Up programming, information hiding, programming style and internal documentation.

**5. Testing Principles:** Levels of testing, functional testing, test plane, test case specification, Unit testing, Integration Testing, Alpha & beta testing, system testing and debugging.

**6. Software Reliability & Quality Assurance:** Reliability issues, Reliability metrics, Reliability growth modeling, Software quality, IOS 9000 Certification for Software industry, SEI capability maturity model, Comparison between ISO 7 SEI CMM. CASE (Computer Aided Software Engineering): CASE and its scope, CASE support in software life cycle, documentation, project management, internal interface, Reverse Software Engineering, Architecture of CASE environment.

#### **Reference books-**

1. Pressman, Roger S., "Software Engineering A Practitioner's Approach Ed. Boston: McGraw Hill, 2001.
2. Jalote, Pankaj, "Software Engineering Ed.2" New Delhi: Narosa 2002.
3. Schaum's Series, "Software Engineering" TMH.
4. Ghezzi Carlo and Others "Fundamentals of Software Engineering" PHI.
5. Alexis, Leon and Mathews Leon, "Fundamentals of software Engg".
6. Sommerville, Ian, "Software Engineering" AWL.
7. Fairly, "Software Engineering" New Delhi TMH.
8. Pfleeger, S. "Software Engineering" Machmillan.

## **FOURTH SEMESTER**

### **BIT (Bachelor of Information Technology)**

1. **Course Number** : **BIT-403**
2. **Name of Course** : **Database Management System**
3. **Credit Hours** : **5(4-1-0)**

#### **UNIT 1**

DBMS Definition – Characteristics of DBMS – Application and advantages of DBMS– Instances – Schemas and Database States – Three Levels of Architecture – Data Independence – DBMS languages– Data Dictionary– Database Users– Data Administrators.

#### **UNIT 2**

Data Models– types and their comparison– Entity Relationship Model– Entity Types– Entity Sets– Attributes and its types– Keys– E-R Diagram– Data Integrity– RDBMS :Concept– Components and Codd's rules.

#### **UNIT 3**

Relational Algebra (selection, projection, union, intersection, Cartesian product, Different types of join like theta join–equi-join, natural join, outer join) Functional Dependencies– Good & Bad Decomposition– Anomalies as a database: A consequences of bad design– Normalization: 1NF, 2NF, 3NF, BCNF, 4NF 5NF.

#### **UNIT 4**

Introduction to SQL, DDL, DML, and DCL statements– Creating Tables– Adding Constraints– Altering Tables, Update, Insert, Delete Tables & various Form of SELECT- Simple, Using Special Operators for Data Access– Aggregate functions– Joining Multiple Tables (Equi Joins) – Joining a Table to itself (self Joins) Functions.

#### **UNIT 5**

Introduction to PL/SQL (blocks of PL/SQL, Variables, constants) – Control Structure – Introduction to Stored Procedures–Functions–Cursor and Triggers

- References: 1. H. F. Korth & A. Silverschatz, Database Concepts, Tata McGraw Hill, New Delhi
2. C. J. Date, Database Systems, Prentice Hall of India, New Delhi.
  3. Ivan Bayross, SQL, PL/SQL, The programming language of Oracle.

## **FOURTH SEMESTER**

### **BIT(Bachelor of Information Technology)**

1. **Course Number** : **BIT-404**
2. **Name of Course** : **Statistical Tools and Techniques**
3. **Credit Hours** : **4(3-1-0)**

**UNIT-1 .Introduction of Statistics:** Origin, development, definition, scope, uses and limitations. Types of Data- Qualitative and quantitative data, cross sectional and time series, data, discrete and continuous data, frequency and non-frequency data. Nominal, ordinal, ratio and interval scales.

**UNIT-2.Collection and Scrutiny of Data:** Collection of primary and secondary data- its major sources including some government publications, scrutiny of data for internal consistency and detection of errors of recording, classification and tabulation of data.

**UNIT-3.Presentation of Data:** Frequency distribution and cumulative frequency distribution, diagrammatic and graphical presentation of data, construction of bar, pie diagrams, histograms, frequency polygon, frequency curve and ogives.

**UNIT-4.Measures of Central Tendency/Location:** Arithmetic mean, median, mode, geometric mean, harmonic mean; partition values-quartiles, deciles, percentiles and their graphical location along with their properties, applications, merits and demerits.

**UNIT-5.Measures of Dispersion:** Concept of dispersion, characteristics for an ideal measure of dispersion. Absolute and relative measures based on: range, inter quartile range, quartile deviation, coefficient of quartile deviation, Mean deviation, coefficient of mean deviation, standard deviation (s), coefficient of variation and properties of these measures.

## **FOURTH SEMESTER**

### **BIT (Bachelor of Information Technology)**

1. **Course Number** : **BIT-405**
2. **Name of Course** : **ENVIRONMENTAL STUDIES**
3. **Credit Hours** : **4(3-1-0)**

**Unit - I** Introduction: Meaning, definition and scope of Ecology. Ecosystem: - Definition, structure and function. Food chain & Food Web. Ecological Pyramids.

**Unit - II** Harnessing Resources: Conventional Energy Sources: - Fossil fuel, Nuclear Energy. NonConventional Energy Sources:-Solar, Wind, Water, Biomass and Biogas, Ocean thermal energy Case study on Solar Energy.

**Unit - III** Environmental Pollution and Global Issues: Air, Water, Soil & Noise pollution- sources and consequences. Solid waste management. Green house effect, Global Warming, Ozone layer depletion and its effect. Case study on global warming.

**Unit - IV** Human Population: Population growth and its impact, Urbanization, Control Measures.

**Unit - V** Environment Education and Protection: Meaning, Need and objectives. Role of IT in Environment & Human health. The Environment (Protection) Act 1986. Case study on violation of Environment Protection Act. (

**Text Books:** 4. Agarwal, K.C., Environment Biology, Nidi Publ. Ltd. Bikaner 5. Joseph Benny, Environmental Studies, Tata McGraw Hill 6. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad Reference Books: 3. Brunner R.C., Hazardous Waste Incineration, McGraw Hill Inc., 4. Clark R.S., Marine Pollution, Clarendon Press, Oxford (TB)

## **FIFTH SEMESTER**

### **BIT(Bachelor of Information Technology)**

|                          |                 |
|--------------------------|-----------------|
| <b>4. Course Number</b>  | <b>BIT-501</b>  |
| <b>5. Name of Course</b> | <b>PYTHON</b>   |
| <b>6. Credit Hours</b>   | <b>5(4-1-0)</b> |

**UNIT I** Python, Features of Python, Writing Python Program, Executing a Python Program  
Comments in Python, Docstrings, Variables, Datatypes in Python, Built-in datatype, Sequences in  
Python, Literals in Python, Determining the Datatype of a Variable, User-defined Datatypes,  
Constants in Python, Identifiers and Reserved words, Naming Conventions in Python.

**UNIT II** Operators in Python Operator, Output statements, Input Statements, Command Line  
Arguments, Control Statements: if Statement, if ... else Statement ,if ... elif ... else  
Statement, while Loop, for Loop, Infinite Loops, Nested Loops, else Suite, break Statement,  
continue Statement, pass Statement, assert Statement, return Statement

**UNIT III** Functions: Defining a Function, Calling a Function, Returning Results from a  
Function, Returning Multiple Values from a Function, Functions are First Class Objects, Pass by  
Object Reference, Formal and Actual Arguments, Positional Arguments, Keyword Arguments,  
Default Arguments, Variable Length Arguments, Local and Global Variables, The Global  
Keyword, Passing a Group of Elements to a Function, Recursive Functions, Anonymous  
Functions or Lambdas, Function Decorators, Generators

**UNIT IV** Introduction to OOPS: Features of Object Oriented Programming System  
(OOPS), Classes and Objects, Constructors, Inheritance and Polymorphism, Operator  
Overloading, Method Overloading, Method Overriding, abstract class and interface.

**UNIT V** Errors in a Python Program, Exceptions, Exception Handling, Types of Exceptions,  
Except clause, try-finally clause, raising an exception, assert Statement, User-Defined  
Exceptions.

Files in Python: Files, Types of Files in Python, Opening a File, Closing a File, Working with  
Text Files Containing Strings, Knowing Whether a File Exists or Not, Working with Binary  
Files, with Statement, seek() and tell() Method.

#### **References:**

1. Learning To Program With Python by Richard L. Halterman
2. Learning Python by Mark Lutz

## FIFTH SEMESTER

### BIT(Bachelor of Information Technology)

|                          |                           |
|--------------------------|---------------------------|
| <b>1. Course Number</b>  | <b>BIT-502</b>            |
| <b>2. Name of Course</b> | <b>Wireless computing</b> |
| <b>3. Credit Hours</b>   | <b>5(4-1-0)</b>           |

**Unit-I** Introduction , Historical Perspective, Wireless Handheld Devices, Terminology, Micro browsers,

Introduction to WML – general layout basic tags and images, Advantages and disadvantages of Wireless networking.

**Unit-II** Wireless Service Providers Mobile service providers How cell phones works? Wap i-mode Messaging services- SMS,EMS,MMS wireless services WML- softkeys, tables, forms, comments.

**Unit-III** Wireless Networks, WLANS IEEE 802.11 standards HIPETLAN European alternative WWANs,

WPANs, Fixed Wireless WML-setvar, onevent, templates Multimedia **Unit-IV** Wireless Communication Technologies, Radio Frequency (RF) Laser and infrared WiFi, Bluetooth, Satellite Digital Cellular XHTML Mobile.

**Unit-V** Wireless Access Technologies FDMA, TDMA, CDMA Generational technologies [2G, PCS,GSM, 2.5G, 3G, 4G(4G+)], XML.

**Unit-VI** Location –based Services & Technologies , WML & ASP.NET, WML & ASP.NET, MAC protocols for digital cellular system such as GSM,. MAC protocols for wireless LANs such as IEEE802.11 and HIPERLAN I and II.

### References:

1. Data Dissemination in Wireless Coputing Environments, By Kian-Lee, Tan , Beng Chin Ooi
2. Wireless Information Networks, By Kaveh Pahlavan, Allen H.Levesque
3. Wireless Home Networking for Dummies ,By Danny Brier, Pat Hurley, Edward Ferris
4. Just Enough Wireless Computing, By Ian S.Hayes
5. Ad Hoc Wireless Networks : Architectures and Protocols By C. Siva Ram Murthy, B. S. Manoj , Published Hall PTR, 2004

## FIFTH SEMESTER

### BIT(Bachelor of Information Technology)

|                       |  |
|-----------------------|--|
| <b>Course Number</b>  | <b>BIT-503</b>                           |
| <b>Name of Course</b> | <b>Cryptography and Network Security</b> |
| <b>Credit Hours</b>   | <b>5(4-1-0)</b>                          |

**UNIT I -INTRODUCTION** :Security trends – Legal, Ethical and Professional Aspects of Security, Need for Security at Multiple levels, Security Policies – Model of network security – Security attacks, services and mechanisms, Classical encryption techniques: substitution techniques, transposition techniques, steganography- Foundations of modern cryptography: perfect security – information theory – product cryptosystem – cryptanalysis.

**UNIT II -SYMMETRIC KEY CRYPTOGRAPHY** :MATHEMATICS OF SYMMETRIC KEY CRYPTOGRAPHY: Algebraic structures – Modular arithmetic-Euclid’s algorithm-Congruence and matrices – Groups, Rings, Fields- Finite fields- SYMMETRIC KEY CIPHERS: SDES – Block cipher Principles of DES – Strength of DES – Differential and linear cryptanalysis – Block cipher design principles – Block cipher mode of operation – Evaluation criteria for AES – Advanced Encryption Standard – RC4 – Key distribution.

**UNIT III- PUBLIC KEY CRYPTOGRAPHY** :MATHEMATICS OF ASYMMETRIC KEY CRYPTOGRAPHY: Primes – Primality Testing – Factorization – Euler’s totient function, Fermat’s and Euler’s Theorem – Chinese Remainder Theorem – Exponentiation and logarithm – ASYMMETRIC KEY CIPHERS: RSA cryptosystem – Key distribution – Key management , ElGamal cryptosystem – Elliptic curve arithmetic-Elliptic curve cryptography.

**UNIT IV -MESSAGE AUTHENTICATION AND INTEGRITY** :-Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC – SHA –Digital signature and authentication protocols – DSS- Entity Authentication: Biometrics, Passwords, Challenge Response protocols- Authentication applications – Kerberos, X.509

**UNIT V -SECURITY PRACTICE AND SYSTEM SECURITY** :Electronic Mail security – PGP, S/MIME – IP security – Web Security – SYSTEM SECURITY: Intruders – Malicious software – viruses – Firewalls.

#### **References:**

William Stallings, Cryptography and Network Security: Principles and Practice, PHI 3rd Edition, 2006.

C K Shyamala, N Harini and Dr. T R Padmanabhan: Cryptography and Network Security, Wiley India Pvt.Ltd

BehrouzA.Foruzan, Cryptography and Network Security, Tata McGraw Hill 2007.

Charlie Kaufman, Radia Perlman, and Mike Speciner, Network Security: PRIVATE Communication in a PUBLIC World, Prentice Hall, ISBN 0-13-046019-2

## FIFTH SEMESTER

### BIT(Bachelor of Information Technology)

1. **Course Number :** BIT-504
2. **Name of Course :** Optimaization techniques
3. **Credit Hours :** 4(3-1-0)

**Introduction:** Formulation and Graphical solution of L.P.P (two variables), limitations and advantages of L.P

**Simplex Method:** Slack and surplus variables, B.F.S from F.S Simplex method for L.P.P(Three variables).

**Replacement Problem:** Replacement of Items when time is continuous and discrete.

**Queuing Theory:** Queuing process, input process, servicing facility, distribution of arrivals & service time.

**Transportation and Assignment Problem:** Mathematical formulation, North-West corner rule, Lowest cost entry method, Unit cost penalty method, Assignment problem.

**Games Theory:** Pay off matrix, Pure & mixed strategy, Saddle point, 2\*2 game without saddle point, 2\*n game, graphical method for 2\*n & n\*2 game.

#### **References:**

*Tara, H.A Operation Research McMillan*

*Srinath, L.S Linear Programming East west Pub*

## **FIFTH SEMESTER**

### **BIT(Bachelor of Information Technology)**

**Course Number :** BIT-505(elec1)  
**Name of Course :** DATA WAREHOUSING & MINING  
**Credit Hours :** 4(3-1-0)

#### **UNIT I : DATA WAREHOUSING**

Data Warehousing Components –Building A Data Warehouse – Mapping The Data Warehouse To A Multiprocessor Architecture – DBMS Schemas For Decision Support – Data Extraction, Cleanup, And Transformation Tools –Metadata.

#### **UNIT II : BUSINESS ANALYSIS**

Reporting And Query Tools And Applications – Tool Categories – The Need For Applications – Cognos Impromptu – Online Analytical Processing (OLAP) – Need – Multidimensional Data Model – OLAP Guidelines – Multidimensional Versus Multirelational OLAP – Categories Of Tools – OLAP Tools And The Internet.

#### **UNIT III : DATA MINING**

Introduction – Data – Types Of Data – Data Mining Functionalities – Interestingness Of Patterns – Classification Of Data Mining Systems – Data Mining Task Primitives – Integration Of A Data Mining System With A Data Warehouse – Issues –Data Preprocessing.

#### **UNIT IV : ASSOCIATION RULE MINING AND CLASSIFICATION**

Mining Frequent Patterns, Associations And Correlations – Mining Methods – Mining Various Kinds Of Association Rules – Correlation Analysis – Constraint Based Association Mining – Classification And Prediction – Basic Concepts – Decision Tree Induction – Bayesian Classification – Rule Based Classification – Classification By Back Propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction.

#### **UNIT V : CLUSTERING AND TRENDS IN DATA MINING**

Cluster Analysis – Types Of Data – Categorization Of Major Clustering Methods – K-Means– Partitioning Methods – Hierarchical Methods – Density-Based Methods –Grid Based Methods – Model-Based Clustering Methods – Clustering High Dimensional Data – Constraint – Based Cluster Analysis – Outlier Analysis – Data Mining Applications.

#### **References:**

Alex Berson And Stephen J.Smith, “Data Warehousing, Data Mining And OLAP”, Tata McGraw – Hill Edition, Thirteenth Reprint 2008.

Jiawei Han And Micheline Kamber, “Data Mining Concepts And Techniques”, Third Edition, Elsevier, 2012.

Pang-Ning Tan, Michael Steinbach And Vipin Kumar, “Introduction To Data Mining”, Person Education, 2007.

### **FIFTH SEMESTER**

#### **BIT(Bachelor of Information Technology)**

- 1. Course Number** : **BIT-505(elec2)**
- 2. Name of Course** : **Computer Graphics**
- 3. Credit Hours** : **4(3-1-0)**

**Introduction of Computer Graphics** :Computer Graphics and its application,components, computer graphics hardware andsoftware, Display Devices and types.

**Introduction of Point Plotting Technique & Coordinate System** :DDA Line Drawing Algorithm, Bresenham’s line drawing algorithm.

**Incremental Method Circle Generation Algorithm** :DDA Method Midpoint Circle Generation Algorithm, Bresenham’s Algorithm forCircle Generation.

**Introduction of Transformation and Transformation Principles** :Translation, Scaling,Shearing, reflection and Rotation, Composite transformation, Instant transformation andconcatenation of matrices, Homogeneous coordinate and matrices.

**Intro of Clipping and Windowing and Viewing Transformation** :Viewing coordinate references frame and window–to-viewport, mapping, Pointclipping and Line clipping, Sutherland-cohen algorithm, Midpoint subdivision algorithm,Sutherland-Hodgeman polygon clipping algorithm

**Color Model** : Light, basic characteristic of light ,colour, CIE Chromaticity digram, colormodels (XYZ,RGB,CMY,CMYK,HSV,YIQ,HLS,HIS),Conversions between color models.

#### **References :**

Computer Graphics , Hearn & Baker, PHI

## FIFTH SEMESTER

### BIT(Bachelor of Information Technology)

- |                          |          |                       |
|--------------------------|----------|-----------------------|
| <b>1. Course Number</b>  | <b>:</b> | <b>BIT-505(elec3)</b> |
| <b>2. Name of Course</b> | <b>:</b> | <b>C# . NET</b>       |
| <b>3. Credit Hours</b>   | <b>:</b> | <b>4(3-1-0)</b>       |

**Unit I:** Introduction to C# Programming, What is C#? ,Does C# Replace Java? ,Simple Program: Printing a Line of Text ,Memory Concepts ,Variables and Data types ,Initialization of Variables , Variable Scope , Constants ,Value Types and Reference Types ,CTS Types

**Unit II:** Operators, control statements, Arrays and Strings, Exception Handling • Exception Classes • Standard Exceptions • User Defined Exceptions Delegates

**Unit III:** Object Oriented Programming • Objects and Classes • Methods and Properties • Constructors and Destructors Inheritance Types of Inheritance • Implementation versus Interface Inheritance • Multiple Inheritances • Structs and Classes • Abstract Classes • Implementing Polymorphism by Method Overloading • Implementing Polymorphism by Method Overriding

**Unit IV:** Interfaces and Structures Interfaces • Defining and Implementing Interfaces • Derived Interfaces • Accessing Interfaces • Overriding Interfaces Structures • Defining Structs • Creating Structs • Creating Enum

**Unit V:** An Overview of C#.Net Building Windows Based Applications • Standard Controls • Components • Forms • Menus and Dialogues • Validating user input Accessing Data with ADO.NET, Crystal Reports • Overview of ADO.NET • Accessing Data • Using Dataset Objects and Updating Data • Binding, Viewing, and Filtering Data • Connecting With the Database

### **References:**

Beginning ASP.NET 3.5: In C# and VB, WROX publication

C# 2008 Programming Black Book by [Kogent Solutions Inc](#) (Author)

## SIXTH SEMESTER

### BIT(Bachelor of Information Technology)

|                   |                                      |
|-------------------|--------------------------------------|
| 1. Course Name    | BIT-602                              |
| 2. Name of Course | Computer Organization & Architecture |
| 3. Credit Hours   | 4(3-1-0)                             |

- 1. Introduction:** Structured computer organization functional units. Languages, virtual machines, evolution of multi level machines, and historical perspective in computer architectures, Interconnection Structure.
- 2. Instruction Set:** Assembly Language instruction formats, addressing modes, Instruction Code, Computer registers, instruction Cycle, Memory reference instruction, Input and output interrupt, Flynn's classification of computers.
- 3. Processors:** CPU organization Instruction execution RISC, CISC, CPU Architecture and I/O Techniques CPU Architecture types (accumulator, register, stack, memory/ register), instruction level parallelism, processor level parallelism, addresses decoding & selecting, addressing modes: register, immediate, direct, indirect, Instruction Cycle.
- 4. Buses & controls :** I/C devices, processor, Buses- ISA bus, PCII Bus, Universal Buses, Single bus, multi bus concepts., Micro architecture level: Data path Micro instruction micro programming, Data Transfer, Control Flow; Instruction set formats (fixed, variable, hybrid),
- 5. Memory parameters:** access/ cycle time, cost per bit); Main memory (Semiconductor RAM & ROM organization, memory expansion, Static & dynamic memory types); Cache memory (Associative & direct mapped cache organizations., implementation of principles of pipe lining, Enhancing performance with pipelining, Memory Hierarchy,.

### **References Books:**

1. Computer Organization by Hamacher, Vranesic & Zaky.
2. Structured Computer Organization by Tanne Baum
3. Computer System Architecture by M.M. Mano

## SIXTH SEMESTER

### BIT(Bachelor of Information Technology)

|                   |                       |
|-------------------|-----------------------|
| 1. Course Number  | BIT – 603             |
| 2. Name of Course | Multimedia Technology |
| 3. Credit Hours   | 5(4- 1– 0)            |

#### 1. Introduction

Introduction to Multimedia, Multimedia objects, Multimedia in business & work.

#### 2. Stages of Multimedia Projects

Multimedia Hardware, Memory & Storage Devices, Communication devices, multimedia software's, presentation tools, tools for object generations, video, sound, image capturing, authoring tools card and page based authoring tools.

#### 3. Multimedia Building Blocks

Text, sound, MIDI, Digital Audio, audio file formats, MIDI under windows environment, Audio & video Capture.

#### 4. Speech Compression & Synthesis

Digital Audio concepts , Sampling variables, Lossless compression of sound, lossy compression & silence compression.

#### 5. Images

Multiple monitors, bitmaps, vector drawing, lossy graphic compression, image file formation animation, Images standards, JPEG Compression, Zig Zig Coding.

#### 6. Video

Video representation , Colors, Video compression, MPEG standard, MHEG Standards, recent development in Multimedia.

#### Reference Books-

1. Tay Vaughan "Multimedia, Making it work," Osborne Hill
2. Buford, "Multimedia Systems," Addison Wesley
3. Mark Nelson "Data Compression Book", BPB
4. Rosch, "Multimedia Bible", Sams publishing

## SIXTH SEMESTER

### BIT(Bachelor of Information Technology)

|                          |                              |
|--------------------------|------------------------------|
| <b>1. Course Number</b>  | <b>BIT – 603</b>             |
| <b>2. Name of Course</b> | <b>Multimedia Technology</b> |
| <b>3. Credit Hours</b>   | <b>5(4- 1– 0)</b>            |

#### **2. Introduction**

Introduction to Multimedia, Multimedia objects, Multimedia in business & work.

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## SIXTH SEMESTER

### BIT(Bachelor of Information Technology)

|                          |                       |
|--------------------------|-----------------------|
| <b>1. Course Number</b>  | <b>BIT-604(elec2)</b> |
| <b>2. Name of course</b> | <b>E-Commerce</b>     |
| <b>3. Credit Hours</b>   | <b>4( 3 – 1 -0 )</b>  |

#### **1. Introduction**

What is E Commerce, Forces behind E Commerce, E Commerce Industry Framework , Brief History of E Commerce, Consumer to Business Electronic Commerce, Architectural framework?

#### **2. Network Infrastructure for E Commerce**

Network Infrastructure for E Commerce, Market forces behind I-way, Component of I-way, Access Equipment, Global Information Distribution Network, Broad band Telecommunication

#### **3. Mobile Commerce**

Introduction to Mobile Commerce, Mobile Computing Application, Wireless Application Protocols, WAP Technology, Mobile information Devices.

#### **4. Web Security**

Introduction to Web Security, Secured Electronic Transaction (SET), Client Server Network, Emerging Client Server Security Threats, Firewalls & Network Security

#### **5. Encryption**

World Wide Web & Security, Encryption, Transaction Security, Secret Key Encryption, Public Key Encryption, Virtual Private Networks (VPM), Implementation & Management Issues .

#### **6. Electronic Payments**

Overview of Electronic Payments, Digital Token Based Electronic Payment System, Smart Cards, and Credit Card/Debit Card based EPS, Emerging Financial Instruments, Home Banking, Online Banking, Cyber Law for E-Commerce.

#### **7. Net Commerce**

EDI, EDI Application in Business, Legal requirement in E Commerce, Introduction to Supply Chain Management, CRM, Issues in customer Relationship management.

#### **Reference Books-**

1. Ravi Kalakota, Andrew Whinston , “frontiers of Electronic Commerce”, Addison Wesley
2. Denial Amor “The E Business revolution”, Addison Wesley
3. Sokol, “From EDI to Electronic Commerce: A Business Initiative”. TMH
4. Bajaj Nag, “E Commerce : The Cutting Edge of Business”, TMH.

## SIXTH SEMESTER

### BIT(Bachelor of Information Technology)

|                          |                                |
|--------------------------|--------------------------------|
| <b>1. Course Number</b>  | <b>BIT-603(elec3)</b>          |
| <b>2. Name of course</b> | <b>Artificial Intelligence</b> |
| <b>3. Credit Hours</b>   | <b>4( 3 – 1-0 )</b>            |

**Unit I** Introduction: Intelligent Agents, Agents and environments, Good behaviour, The nature of environments, structure of agents, Problem Solving, problem solving agents, example problems, searching for solutions, uniformed search strategies, avoiding repeated states, searching with partial information.

**Unit II** Searching Technique: uniformed search and exploration, Informed search strategies, heuristic function, local search algorithms and optimistic problems, local search in continuous spaces, online search agents and unknown environments, Constraint satisfaction problems (CSP), Backtracking search and Local search for CSP, Structure of problems, Adversarial Search, Games, Optimal decisions in games, Alpha, Beta Pruning, imperfect real-time decision.

**Unit III** Knowledge Representation: First order logic – representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic - Inference in First order logic – propositional versus first order logic – unification and lifting – forward chaining – backward chaining - Resolution - Knowledge representation - Ontological Engineering - Categories and objects – Actions - Simulation and events - Mental events and mental objects.

**Unit IV** Learning: Learning from observations - forms of learning - Inductive learning - Learning decision trees- Ensemble learning - Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming - Statistical learning methods - Learning with complete data - Learning with hidden variable - EM algorithm Instance based learning - Neural networks - Reinforcement learning – Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning.

**Unit V** Applications: Communication, Communication as action, Formal grammar for a fragment of English, Syntactic analysis, Augmented grammars, Semantic interpretation, Ambiguity and disambiguation, Discourse understanding, Grammar induction, Probabilistic language processing, Probabilistic language models, Information retrieval, Information Extraction, Machine Translation.

#### **TEXT BOOK**

1. Stuart Russell, Peter Norvig, “Artificial Intelligence – A Modern Approach”, 2nd Edition, Pearson Education / Prentice Hall of India, 2004.

