S.N.D.T. Women's University, Mumbai
Syllabus- BCA

BCA SEMESTER-I

Code	Subject	L	Pr./ Tu	Cr	Ext. Exam.	Int. Exam.	Total Marks
1101	Business and Technical Communication Skills	3	1	4	75	25	100
1102	Principles and Practice of Accounting	3	1	4	75	25	100
1103	Introduction to Programming and Problem Solving using C	4	-	4	75	25	100
1104	Computer Fundamentals and Operating Systems	4	-	4	75	25	100
1201	Problem Solving using C Lab*	-	2	2	25	25	50
1202	GNU /Linux LAB*	-	2	2	25	25	50
	Total			**20**			**500**

SEMESTER-I	**1 Credit=25 Marks Total Credits = 20 Total Marks = 20*25=500**

BCA SEMESTER-II

Code	Subject	L	Pr./ Tu	Cr	Ext. Exam.	Int. Exam.	Total Marks
2101	Introduction to Logic Circuits and Digital Design	3	1	4	75	25	100
2102	Discrete Structures and Graph Theory	3	1	4	75	25	100
2103	Advanced C	4	-	4	75	25	100
2104	Environmental Science & RTI	4	-	4	75	25	100
2201	Advanced C Lab*	-	2	2	25	25	50
2202	Open Source Operating System and Applications Software's LAB*	-	2	2	25	25	50
	Total			**20**			**500**

SEMESTER-II	**1 Credit=25 Marks Total Credits = 20 Total Marks = 20*25=500**

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BCA SEMESTER-III

Code	Subject	L	Pr./ Tu	Cr	Ext. Exam.	Int. Exam.	Total Marks
3101	Introduction to Microprocessor	4	-	4	75	25	100
3102	Numerical Methods and Algorithms	4	-	4	75	25	100
3103	Computer Organization and Architecture	4	-	4	75	25	100
3104	File Structure and Database Management System	2	2	4	75	25	100
3201	Microprocessors Lab*	-	2	2	25	25	50
3202	Database Management System LAB*	-	2	2	25	25	50
	Total			**20**			**500**

SEMESTER-III	**1 Credit=25 Marks Total Credits = 20 Total Marks = 20*25=500**

BCA SEMESTER-IV

Code	Subject	L	Pr./ Tu	Cr	Ext. Exam.	Int. Exam.	Total Marks
4101	Data Structures and File Organization	3	1	4	75	25	100
4102	Information Systems Analysis and Design	3	1	4	75	25	100
4103	Introduction to Software Engineering	4	-	4	75	25	100
4104	Object Oriented Programming using C++	4	-	4	75	25	100
4201	Data Structures Lab*	1	1	2	25	25	50
4202	Object Oriented Programming C++ Lab*	-	2	2	25	25	50
	Total			**20**			**500**

SEMESTER-IV	**1 Credit=25 Marks Total Credits = 20 Total Marks = 20*25=500**

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Syllabus- BCA

BCA SEMESTER-V

Code	Subject	L	Pr./ Tu	Cr	Ext. Exam.	Int. Exam.	Total Marks
5101	Data Communication and Networking	3	1	4	75	25	100
5102	JAVA Programming	4	-	4	75	25	100
5103	Visual and Database Programming	4	-	4	75	25	100
5104	Internet Programming	4	-	4	75	25	100
5201	JAVA Programming LAB*	-	2	2	25	25	50
5202	Internet Programming LAB*	1	1	2	25	25	50
	Total			**20**			**500**

SEMESTER-V	**1 Credit=25 Marks Total Credits = 20 Total Marks = 20*25=500**

BCA SEMESTER-VI

Code	Subject	L	Pr./ Tu	Cr	Ext. Exam.	Int. Exam.	Total Marks
6101	Management Information System	3	1	4	75	25	100
6102	Enterprise Resource Planning	3	1	4	75	25	100
6103	INTELLIGENT PROPERTY RIGHTS, PATENTS AND CYBER LAWS	4	-	4	75	25	100
6104	Elective						
	1. E-COMMERCE	4	-	4	75	25	100
	2. Artificial Intelligence						
	3. Web Technology						
6201	Project*	-	4	4	50	50	100
	Total			**20**			**500**

SEMESTER-VI	**1 Credit=25 Marks Total Credits = 20 Total Marks = 20*25=500**

SEMESTER						
I	**II**	**III**	**IV**	**V**	**VI**	**1 Credit=25 Marks Total Credits = 120 Total Marks = 120*25=3000**
20	**20**	**20**	**20**	**20**	**20**	

Branch: BCA	**Semester-I**
Subject Code: 1101	**Lecture: 04** **Credit: 04**
Subject Title	**BUSINESS AND TECHNICAL COMMUNICAT ION SKILLS**

Modules	Sr.No	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Basic s of Communication:** Objective s and functions of Communication, Nature and scope of Communication in organizational setting, Formal and Informal Communication, Oral and Written Communication, Verbal and Non-verbal Communication Listening	8	36
	2	**Basics of English Language:** Importance of English in modern times, Parts of speech Tenses, Types of Sentences, Vocabulary building Paragraph building, Summarizing, Problems of Written Communication: Errors of spellings, grammar, punctuation, improper sentence construction, literal translation, faulty formatting etc. Problems of Oral Communication: Confused words, stress, accent, pitch, errors due to regionality etc	10	
UNIT-II	3	**Ora l Communication**: Group discussion, Extempore speech, Mock interviews Reading aloud editorials of newspapers, articles etc. before an audience	10	30
	4	**Preparing a Presentation:** Factors to be considered before making a presentation (Who, Why, Where, When, How), Psychological Preparation, Preparing Written Material, Preparing Visual Aids , Making the Presentation, Factors affecting the Presentation, Speaking faults in presentations.	5	
UNIT-III	5	***Letters- Format of letters*** Principle s of Letter writing, Sales letters, Credit letters, Collection letters, Complaint Letters	7	14
UNIT-IV	6	Job Applications Resumes	4	8
	7	**Report writing**	6	12
Total			50	100

Text & Reference Books:

1. Urmila Rai, S M Rai, "Business Communications", Himalaya Publishing House, 2004
2. Urmila Rai, "Business Communications", Himalaya Publishing House, 1989
3. C. S. Rayudu , "Media and Communication Management ", Himalaya Publishing House, Bombay

4. Dr. Anjali Ghanekar , "Communication Skill for Effective Management" , Everest Publishing House
5. Aspi Doctor & Rhoda Doctor, "Business Communication", 2008
6. Mulgaokar, "Business Communication", Manan Prakashan , 2011

Branch: BCA	**Semester-I**
Subject Code: 1102	**Lecture: 04** **Credit: 04**
Subject Title	**PRINCIPLES AND PRACTICE OF ACCOUNTING**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT –I	1	**Introduction to Book – Keeping & Accountancy** Accounting Terminologies, Double Entry Book – keeping System, Types of Vouchers & Specimen of vouchers	6	12
UNIT -II	2	**Journal:** Meaning, Importance and Utility of Journal Specimen of Journal ; Writing of Journal Entries on the basis of vouchers	6	12
	3	**Ledger** Meaning, Need and Specimen of Ledger Posting of Entries from Journal to Ledger	6	12
UNIT-III	4	**Subsidiary Books** Meaning, Need and Types of Subsidiary Books, Purchase Book, Sa les Book, Purchase Return Book, Sales Return Book, Simple Cash Book with Only Cash Column, Cash Book with Cash and Discount Columns, Cash Book with Cash, Bank and Discount Columns and Analytical Petty Cash Book	13	26
	5	**Bank Reconciliation Statement** Meaning, Need and Importance, Preparation of Bank Reconciliation Statements	6	12
UNIT -IV	6	**Final Accounts of a Proprietary Concern** Preparation of Trading Account, Profit & Loss Account and Balance Sheet with Adjustments like: Closing Stock ; Outstanding Expenses, Prepaid Expenses ; Outstanding Income, Income received in Advance; Depreciation, Treatment of Reserve for Bad & Doubtful Debts, Goods Withdrawn for Personal Use Goods Distributed a s Free Sample, Interest on Bank Loan & Investments	13	26
Total			50	100

Text Books:

1. Choudhari and Chopade, "Book-Keeping & Accountancy", Sheth Publications, 1998

References:

1) Kishnadwala, "Book-Keeping & Accountancy", Manisha Prakashan, 1983.

2) Ainapurna & Ainapurna, "Management Accountancy"

Branch: BCA	**Semester-I**
Subject Code: 1103	**Lecture: 04** **Credit: 04**
Subject Title	**INTRODUCTION TO PROGRAMMING AND PROBLEM SOLVING USING C**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT -I	1	Overview of programming languages; Definition of the program, Concept- Compilation, interpretation, source code, object code, execution, input and output, debugging etc	6	24
	2	Expressions; control structures; subroutines, Storage management; scoping rules; bindings for names	6	
UNIT-II	3	Introduction to problem solving : Concept: problem solving, Problem solving techniques (Trail & Error, Brain Storming, Divide & Conquer).	5	24
	4	Steps in problem solving (Define Problem, Analyze Problem, Explore Solution) Algorithms and Flowcharts (Definitions, Symbols), Characteristics of an algorithm Conditionals in pseudo-code, Loops in pseudo code Simple Examples: Algorithms and flowcharts (Real Life Examples).	7	
UNIT-III	5	Introduction to 'C' Language History, Structures of 'C' Programming, Function as building blocks. Language Fundamentals : Character set, C Tokens, Keywords, Identifiers, Variables, Constant, Data Types, Comments.	4	22
	6	Ope rators Types of operators, Precedence and Associativity, Expression, Statement and types of statements, Build in Operators and function; Console based I/O and related built in I/O function: printf(), scanf(), getch(), getchar(), putchar(); Concept of header files, Preprocessor directives: #include, #define.Conditionals and Loops:	7	

UNIT-IV	7	Control structures: Decision making structures: If, If-else, Nested If-else, Switch; Loop Control structures: While, Do-while, for, Nested for loop; Other statements: break, continue, goto, exit.	6	20
	8	Storage types: Automatic , externa l, register and static variables	4	
	9	User defined types, array definition , 1-D, 2-D array. Functions: Defining and accessing, passing arguments, Function prototypes	5	10
Total			50	100

Text and Reference Books:

1. Roosta Seyed, "Foundations of Programming Languages Design & Implementation", 3rd Edition, Cenage lea rning. ISBN-13:978-81-315-1062-9.
2. Sethi Ravi, "Programming Languages: Concepts and Constructs" Pearson Education, ISBN: 9788177584226
3. Sebesta R. W., "Concepts of programming languages", Pearson Education 2001, 4th edition. ISBN-81-317-0837-3
4. Venu Gopal, "Programming in C" ,Tata Mcgraw-Hill Publishing company Limited,1997
5. Complete reference with C Tata McGraw Hill
6. C – programming E.Balagurusamy Tata McGray Hill
7. How to solve it by Computer : Dromey, PHI
8. B.S Gottifried, "Schaum,s Outline of Theory and Problems of Programming with C", Tata McGraw Hill,1995
9. Kerningham and Ritchie, "The C Programming Language", Prentice Hall,1991.
10. Ramkumar and Agrawal, "Programming in ANSI C", Tata McGraw Hill, 1996.
11. Y.P Kanetkar, "Let Us "C", , Infinity Science Press,2008
12. An introduction to data structures with applications, Jean-Paul Trembly and Paul Sorenson, (2nd edition), 1884
13. Jignesh Shah, "Programming in /c " , Charotar Publisher, 2010

Branch: BCA	**Semester-I**
Subject Code: 1104	**Lecture: 04** **Credit: 04**
Subject Title	**COMPUTER FUNDAMENTALS AND OPERATING SYSTEMS**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Introduction to computers:** What is Computer? Comparison between computer and human brain, Characteristics of Computer, Computer applications **History of Computers:** Initial development, Generation	5	10

		of Computer, Evolution of Personal Computers.		
	2	**Computer Organisation:** Basic units of computer, Block diagram of Computer, Input Unit, Processing Unit, Output Unit, Storage Unit. **Types of Printers:** Hard Copy output, Impact Printers, Non-Impact Printers, Serial and Line Printers, Dot-Matrix Printers, Laser Printers, Daisy wheel printers, Drum and Chain Printers, Thermal Printers.	5	10
UNIT-II	3	**External storage devices :** SASD, DASD, Punch Cards, Magnetic Tapes, Blocking utilization factor, Magnetic Disk, Tracks, Sectors, Seek Time, Rotational latency, Access time, Numerical problems	5	10
	4	**Type of Computer s :** Digital, Analog, Hybrid Computers, General purpose Computers, Turnkey Systems, Micro Computers, Mini Computers, Mainframes, Super Computers	5	10
UNIT_III	5	Overview of operating systems, functionalities and characteristics of OS. Hardware concepts related to OS, CPU states, I/O channels Types of Os – (Explain concepts): Single processor systems, Uni-programmed, Multiprogrammed, Batch, Time sharing-Interactive, Multitasking, Multiprocessor systems, Parallel systems, Distributed systems, Special purpose systems, Real Time systems, Multimedia systems Handheld Systems	6	12
	6	The concept of a process, operations on processes, process states, concurrent processes, process control block, process context	6	12
UNIT-IV	7	Job and processor scheduling, scheduling algorithms process hierarchies	5	10
	8	Problems of concurrent processes, critical sections, mutual exclusion, synchronisation, deadlock.	6	12
	9	Memory management strategies: Basic concepts, Swapping – concept Contiguous memory allocation • Memory mapping & Protection • Memory Allocation • Fragmentation Non-contiguous memory allocation • Paging Segmentation- Basic method Virtual Memory – concept	7	14
Total			50	100

Text and Reference Books:

1. P.K.Sinha, "Computer Fundamentals", BPB Publications, March 1990

2. Silberschatz, Galvin, "Operating System Principles" John Wiley & Sons, 2006

3. Andrew Tanenbaum, Modern Operating Systems, Prentice Hall.

4. William Stallings, Operating Systems, Prentice Hall.

5. Harvey M. Deitel, An introduction to operating systems. Addison-Wesley.

6. Andrew Tanenbaum & Albert Woodhull, Operating Systems: Design and Implementation. Prentice-Hall

7. Douglas Comer, Ope rating System Design - The XINU Approach. Prentice -Hall

Branch: BCA	**Semester-I**
Subject Code: 1201	**Lecture: 02** **Credit: 02**
Subject Title	**PROBLEM SOLVING USING C LAB**

Modules	Sr.No.	**Topic and Details**	No. of **Lectures/ Practicals** Assigned	Marks Weightage %
UNIT-I	1	Control Statement: Selection Statements, if, Nested if, The if-else-if, etc. The Conditional, Expression, Selection switch, Nested switch, Iteration Statements- The for loop, . The while loop, The do-while loop, Jump Statements- The goto & label ,The break & continue, The exit() function	5	10
UNIT-II	2	Implementations of Operators : Arithmetic, Logical, bitwise, Precedence and Associativity, composite statements. Unary, binary and ternary operators.	5	10
	3	Built in Operators and function Console based I/O and related built in I/O function: printf(), scanf(), getch(), getchar(), putchar();	4	8
UNIT-III	4	Concept of header files, Preprocessor directives: #include, #define. And macros implementations	2	4
	5	Implementation of Storage types: Automatic external, register and static variables	2	4
UNIT-IV	6	Implementation of Functions: Defining and accessing, passing arguments, Function prototypes., function calling mechanism	4	8
	7	Implementation of 1-D and multi dimension Array	3	6
Total			25	50

Branch: BCA	**Semester-I**
Subject Code: 1202	**Lecture: 02** **Credit: 02**
Subject Title	**GNU /Linux LAB**

Modules	Sr.No.	**Topic and Details**	No. of **Lectures/Practicals** Assigned	Marks Weightage %
UNIT-I	1	Getting started –Commands	3	6
	2	The Unix Architecture and command usage – Commands ,General-purpose utilities	2	4
UNIT-II	3	The File system –Commands	2	4
	4	Handling ordinary files, Basic file attributes	2	4
UNIT-III	5	The vi Editor	5	10
	6	Simple Filters, Filters using regular expressions - use of grep command	3	6
UNIT-IV	7	Introduction to shell concept and writing shell script	5	10
	8	Essential Shell Programming	3	6
Total			25	50

Text and reference Books:

1. The Linux Kernel Book Rem Card, Eric Dumas and Frank Mevel Wiley Publications sons, 2003
2. Unix Concepts and Applications by Sumitabha Das, Fourth Edition, TMH
3. MySQL Bible Steve Suchring John Wiley sons, 2002
4. Programming PHP Rasmus Lerdorf and Levin Tatroe O'Reilly Publications, 2002
5. Terry Collings, Kurt Wall, "Red Hat Linux Network and System Administration" 3rd edition Wiley.
6. Neil Mathews, "Beginning Linux Programming" 4th edition, Wrox Press.
7. P.Koparkar, "Unix For You", Tata McGraw-Hill
8. Y.P.Kanetkar, "Unix Shell programming", BPB publications
9. Batch, "Design of Unix Operating System"

Branch: BCA	**Semester-II**
Subject Code: 2101	**Lecture: 04** **Credit: 04**
Subject Title	**INTRODUCTION TO LOGIC CIRCUITS AND DIGITAL DESIGN**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1.	**Digital Logic Circuits:** Introduction to digital signals, Logic Gates Universal gates, Implementation of Universal gates using basic gates, Conversion of Universal gates into Basic Gates, Exclusive gates Truth Table, De-Morgan's Theorem : Statement and Proof	8	16
UNIT-II	2.	**Boolean Algebra:** Boolean Laws, Simplification of Boolean expression using Laws, Min terms (SOP) Ma x terms (POS), Standard/Canonical SOP and POS forms, K-map(2,3 and 4 variable s) Don't care conditions	8	12
	3	**Truth tables:** Simplification of Boolean expression using Truth Tables	4	8
UNIT-III	4	**Combinational Circuits:** What is a combinational circuit - Half Adder, Full Adder, Half Subtracter, Full Subtractor, Multiplexers (MUX) (using Basic gates) (2:1 , 4:1, 8:1) - Designing of Higher Mux using Lower Mux a. 4:1 using 2:1 b. 8:1 using 4:1 c. 16:1 using 8:1 d. 16:1 using 4:1 only Implementation of Mux in Boolean Algebra De-Multiplexer (De-MUX) (using Nand gates) a. 1:2 b. 1:4 c. 1:8 Designing of Higher demux using lower demux a. 1:4 using 1:2 b. 1:8 using 1:4 c. 1:16 using 1:8 d. 1:16 using 1:4 only	14	28
UNIT-IV	5	**Flip flops, Counters and Registers:** **Flip flops**, What is Sequential circuits, S R flip flop (NAND and NOR),Clocked SR flip flop D flip flop, JK flip flop, T flip flop **Counters**, Types of Counters, Design of 4 bit Asynchronous counter, Design of 4 bit synchronous counter, Design of Modulus count	12	24
	6	**Computer Arithmetic:** Number systems and character codes, Integer representation, Integer arithmetic, Floating point representation, Floating point arithmetic.	4	8
Total			50	100

Text & Reference Books:

1. R P Jain, "Modern Digital Electronics" , Tata McGra w-Hill Education, 2003

2. N.G. Palan, "Logic Circuit" Technova Publication,1998

Branch: BCA	**Semester-II**
Subject Code: 2102	**Lecture: 04** **Credit: 04**
Subject Title	**DISCRETE STRUCTURES AND GRAPH THEORY**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Set Theory:** Definitions: Sets, Subsets, Types of sets, Power set, Complement of a set, Operations on sets, set builder form, listing form, set cardinality and examples, Venn Diagram & examples, Fundamental laws of sets and examples **.**	8	16
UNIT-II	2	**Relations:** Definitions, i. Relation, ii. Reflexive Relation, iii. Symmetric Relation, iv. Transitive relation, vs Antisymmetric Relation, vi. Equivalance Relation, vii. Equivalance classes. Theorems and problems Recurrence relation: Definitions and problems	8	16
	3	**Functions**: Define i. Function ii. Injective functions iii. Surjective functions iv. Bijective functions v. Composite function vi. Inverse of a function. vii. Domain viii. Range Theorems	8	16
UNIT-III	4	**Permutations and Combinations** : Definitions: Permutation, Combination and problems	6	12
UNIT-IV	5	**Binomial theorem and Mathematics Induction:** Binomial Theorem : Statement and problems Mathematical Induction: 1st and 2nd principles and problems	4	8
	6	**Proper ties of integers:** Definition of gcd, lcm, Theorems Euclidean algorithm and problems	4	8
	7	**Graph theory:** Graphs, types of graphs, Handshaking Lemma, Isomorphism of graphs, Subgraphs, Complement of graph.	12	24
		Total	50	100

Text & Reference Books:

1. Kolman,Busby and Ross, "Discrete mathematical Structures and graph theory"

2. Alan Doerr, K. Levasseur , "Applied discrete structure for computer science", Galgotia publications, 1988
3. Trembley & Manohar, "Discrete mathematical Structures with application to computer science", McGraw Hill, 1987.
4. S. Lipschutz; "Schaums outlineseries" , McGraw Hill,1974, Vector analysis.
5. M. Spicgel, "Schaums series of essential computer mathematics", McGraw Hill, 1974

Branch: BCA	**Semester-II**
Subject Code: 2103	**Lecture: 04** **Credit: 04**
Subject Title	**ADVANCED C**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Arrays:** What are Arrays, Array initialization, Passing arrays to a function, Two Dimensional Array, Passing array as arguments to the functions.	8	16
	2	**Pointers:** An Introduction to Pointer, Pointer Declaration and Initialization of Pointer variables, Call by value and Call by Reference, Pointers with Arrays, Pointers and Character Strings	10	20
	3	**Dynamic Memory Allocation**: Introduction, Allocating Block of Memory, Introduction to the following functions Calloc(), Malloc(), Free(), Realloc	6	12
	4	**Structure and Union**: Introduction to Structure, Defining and Declaring Structure Variables, .Dot Operator, Nested Structure, Array of Structure, Introduction to Union Difference between Structure and Union.	6	12
	5	**File Handling**: Why we need a file, File operations(create, open, read, move , write, close), File opening Mode, Closing a file, Input/output operations, Creating and reading a file	6	12
	6	**Graphics :** Introductions to Graphics, Applications of C.G I/O device for, Graphics (mouse, printer, joystick, CRT), Raster and Vector Sc an Display.	8	16
	7	**Creating** Circle, Rectangle, and different geometric shapes with existing predefined functions, filling algorithms, drawing and simple graphics creations with line.	6	12
		Total	50	100

Text Books:

1. Y.P Kanetkar, Let Us" C", Infinity Science Press, 2008
2. B.S Gottifries, "Schaum,s Outline of Theory and Problems of Programming with C" .
3. Kerningham and Ritchie, "the C Programming Language", Pre tice Hall,1991.
4. Ramkumar and agrawal, Programming in ANSI ",Tata McGraw Hill, 1996.

5. Jignesh Shah, "Programming in /c" Charotar Publisher, 2010
6. Venu Gopal, "Programming in C", Tata Mcgraw-Hill Publishing company Limited, 1997
7. E- BalaguruSwamy " Ansi C", Tata McGraw Hill.
8. A.P Godse, "Introduction to Computer Graphics", Technical Publications, 2009

Branch: BCA	**Semester-II**
Subject Code: 2104	**Lecture: 04** **Credit: 04**
Subject Title	**ENVIRONMENTAL SCIENCE & RTI**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	The Multidisciplinary nature of environmental studies, Definition, scope and importance, Need for public awareness	5	10
	2	**Natural Resources**: Renewable and non-renewable resources, Natural resources & role of natural resources with reference to Forests, water, Mineral, Food, Land, Energy, Role of an individual in conservation of these resources	6	12
UNIT-II	3	Ecosystems: Concept of a n ecosystem, Structure and functions of an ecosystem, Types, characteristic features, structure and function of following ecosystems : forest, grassland, desert and aquatic	8	16
	4	**Environmental Pollution –** Definition, Causes, effects and control measures with reference to Air Pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear Hazards, Solid waste management: Causes, effect and control measures of urban and industrial wastes**:** • Role of an individual in prevention of pollution • Pollution case studies related to fie ld of computers Disaster management: floods, earthquake, cyclone and landslides.	12	24
UNIT-III	5	**Disposal of e -waste**	4	8
	6	**Introduction to Green IT:** Concepts of green IT, design, management and education., Approaches of green IT such as virtualization, power management, material recycling, telecommunication, electronic disposals, etc. , Benefits of green IT	7	14
UNIT-IV	7	**Right of Information Act:** Introduction, Right to information and obligations of public authorities, central information commission, state information commission and their duties, powers and functions of information commissions, appeals and penalties, Miscellaneous	8	16

Text Books:

1. Anubha Kaushik, "Environmental Studies". New Age International (P) Ltd.,2007

Branch: BCA	**Semester-II**
Subject Code: 2201	**Lecture: 02** **Credit: 02**
Subject Title	**ADVANCED C LAB**

Modules	Sr.No.	**Topic and Details**	No. of **Lectures/ Practicals** Assigned	Marks Weightage %
UNIT-I	1	Programs with Arrays • Array initialization • Passing arrays to a function Two Dimensional Array	5	10
	2	Programs Using Pointers • Pointer Declaration and Initialization of Pointer variables • Call by value a nd Call by Reference • Pointers with Arrays Pointers and Character Strings	5	10
UNIT-II	3	Programs with Dynamic Memory Allocation Programs with following functions-Calloc(), Malloc(), Free(), Realloc	4	8
	4	Programs Using Structure and Union Defining and Declaring Structure Variables, .Dot Operator, Nested Structure, Array of Structure, Examples of Union.	2	4
UNIT-III	5	Programs using I/O Operations File Handling • File operations(create, open, read, move, write, close) • Program To Create A file • Program to Open a file • Program to Close A file Input/output operations on file Character by –(fgetc, fputc), Reading and writing files	5	10
UNIT-IV	6	Program with Compute r Graphics: • Drawing Shapes using different functions (line, Rectangle, Circle,ellipse,Arc) • Filling shapes with fillcolor options Use of setcolor(), sleep() and delay() functions	4	8
Total			25	50

Text and Reference Books:

1. Y.P Kanetkar, Let Us" C", Infinity Science Press, 2008
2. B.S Gottifries, "Schaum,s Outline of Theory and Problems of Programming with C" .
3. Kerningham and Ritchie, "the C Programming Language", Pre tice Hall,1991.

4. Ramkumar and agrawal, Programming in ANSI ",Tata McGraw Hill, 1996.
5. Jignesh Shah, "Programming in /c" Charotar Publisher, 2010
6. Venu Gopal, "Programming in C", Tata Mcgraw-Hill Publishing company Limited, 1997
7. E- BalaguruSwamy " Ansi C", Tata McGraw Hill.
8. A.P Godse, "Introduction to Computer Graphics", Technical Publications, 2009

Branch: BCA	**Semester-II**
Subject Code: 2202	**Lecture: 02** **Credit: 02**
Subject Title	**OPEN SOURCE OPERATING SYSTEM AND APPLICATIONS SOFTWARE'S LAB***

Modules	Sr.No.	**Topic and Details**	No. of **Lectures/ Practicals** Assigned	Marks Weightage %
UNIT-I	1	**INSTALLING RED HAT LINUX:** Configuring a Dual Boot System , Allocating Disk Space for Linux, Add a new Hard Drive , Use an Existing Partition to Create Space for Loading Linux Using fdisk to Partition a Hard Disk Viewing, The Current Partitions, Deleting Partitions, Creating New Partitions	3	6
	2	THE APACHE INSTALLATION PROCESS, APACHE CONFIGURATION, MANIPULATING THE APACHE httped SERVICE	3	6
UNIT-II	3	**INSTALLING PHP** Quick Install Of PHP, Starting the Install Process to Begin PHP Configuration , To complete Installation of PHP , Binding the PHP Installation with Apache , Registering the Changes made in the httpd.conf With Apache	3	6
UNIT-III	4	**INSTALLING MySQL:** Using the Add/Remove Applications Tool, Using the Linux Command Line, Installing the My SQL RPMS, What to do if the Error Cannot Be Handled Easily, The Directory Tree Created during Installation, MySQL DATABASE ENGINE INSTALL, MySQL Database administration	3	6
	5	**STARTING AND STOPPING MySQL** Shutting down MySQL, Starting MySQL , Setting up, Setting the root Password using the Mysqladmin, Utility to set the root Password , Logging into MySQL after setting the root Password , Directly Updating User Information to set a root Password , Issues with updating the User Table using SQL , Creating a MySQL Super User , User Privileges	3	6

UNIT-IV	6	**CREATING DATABASE** Database Ownership, Permitting a User access to the Inventory Database, The Resources of the Inventory Database , Adding New Users to MySQL , Manipulating the MySQL , Grant Tables Directly Deleting Users from MySQL , Creating Passwords for Users	4	8
	7	**TESTING PHP AND MySQL SET UP** Understanding the syntax of PHP , How are PHP programs created?, Understanding the physical structure of a PHP Program, String Functions Statements, Operators, Looping, PHP functions PHP Forms	6	12
TOTAL			25	50

Branch: BCA	**Semester-III**
Subject Code: 3101	**Lecture: 04** **Credit: 04**
Subject Title	**Introduction to Microprocessors**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Introduction to Microprocessors** History and overview, Growth of microprocessor technology from SSI, MSI, LSI to VLSI, Intel microprocessors-8085 to Pentium II, performance and feature comparisons, Current global trends in Microprocessors	8	16
UNIT-II	2	**8085 Microprocessor:** Internal architecture, Pin-out diagram, Memory addressing schemes, System bus structure, (Data, address and control bus), Multiplexing and de-multiplexing.	8	16
UNIT-III	3	**Programming in 8085:** Addressing modes, Data movement, Arithmetic and logic instructions, Control instructions	8	16
	4	**Interrupts:** Introduction, purpose of interrupts, Interrupt vectors, 8259-Interrupt Controller, Internal organization, pin out, Single and cascaded operation	8	16
UNIT-IV	5	**I/O Interface:** Typical I/O interface, serial communication 8251 A UART: Internal organization and functioning, 8237 DMA Controller: Block Diagram, organization and functioning	8	16
	6	**Memory:** Type of memory, ROM-PROM, EPROM, EEPROM, (Flash ROM Concept), RAM-SRAM, DRAM, EDO, ECC, SDRAM, Packaging-DIP, SIMM, DIMM, Addressing, memory map, address decoding, Overview of 8086/8088 Overview of 80286, 80386, 80486, Pentium, Pentium II, PentiumIII	10	20
		Total	50	100

Text Books:

1. R.S. Gaonkar, "Microprocessor Architecture, programming and Applications with the 8085/8080A", Wiley Eastern Ltd. 2. 1995

References:

1.. "Inside the PC": Peter Norton (Sixth Edition), January 2005
2.. "Microprocessor System-The 8086/8088 Family": Yu-Cheng Liu & Glen A. Gibson
3. "The Intel Microprocessor: 8086/8088, 80286, 80386, Pentium, Pentium Pro. Pentium-II & III": Barry Brey (Fourth Edition)

Branch: BCA	**Semester-III**
Subject Code: 3102	**Lecture: 04** **Credit: 04**
Subject Title	**NUMERICAL METHODS AND ALGORITHMS**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Roots of non-linear equations** Bisection Method, Regula-falsi Method, Newton-Raphson Method, Ramanujan's Methods	6	12
	2	**Direct solution of linear equation** a) Matrix Inversion, b) Gauss-Elimination Method	4	8
UNIT-II	3	**Interpolation:** Finite Differences, a) Newton-Gregory Forward and Backward Formula b) Lagrange's Interpolation Formula for unequal Intervals c) Newton divided difference formula for unequal intervals	8	16
UNIT-III	4	**Numerical Integration** a) Trapezoidal Rule b) Simpson's 1/3 Rule c) Simpson's 3/8 Rule Error estimation for all above 3 methods	6	12
	5	**Numerical Differentiation** Differentiating Newton's Forward and Backward formula	6	12
UNIT-IV	6	**Numerical solution of Differential equation** Taylor's Series, Euler's Method, Runge-Kutta Method	7	14
	7	**Numerical solution of Partial Differential Equations:** Jacobi's Method, Gauss –Seidel Method, Successive Over-Relaxation	7	14
	8	**Curve Fitting B-Splines** Least Squares Curve Fitting Procedures, B-Splines	6	12
Total			50	100

Reference:

1. Numerical Methods: V. Rajaraman "Computer oriented numerical methods (third edition) 1993
2. S.S. Shastri "Introductory methods of numerical analysis" Vol-**2**, PHI, SECOND edition, 1994

Branch: BCA	**Semester-III**
Subject Code: 3103	**Lecture: 04** **Credit: 04**
Subject Title	**Computer Organization and Architecture**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Computer Structures:** Computer components, Computer functions, Basic instruction cycle, Fetch & Execute cycle, Interrupts, Instruction Cycle with Interrupts, Multiple Interrupts, I/O functions, Interconnection structure, Bus Interconnection structures, Bus structure, Multiple bus hierarchy, Elements of Bus design	8	16
UNIT-II	2	**Internal Memory:** Characteristics of memory system Memory hierarchy, Semi conductor main memory, Basic concepts, RAM (Static and Dynamic), ROM (PROM, EPROM, EEPROM, FLASH MEMORY), Memory Module organization Cache Memory, Principle, Elements of cache design (Size, Mapping, Replacement, Write policies, Block size), Error detecting & correcting code	12	24
	3	**External Memory:** Magnetic disk, Data organization and Format, Characteristics, Disk access time, Optical Memory, CD-ROMs, WORM, Erasable optical disk, DVD, Magnetic tape, Difference between disk & tape & DVD	10	20
UNIT-III	4	Input/output • Introduction • Access of I/O devices • I/O Modules (Functions and Structures • Programmed I/O ▪ Overview ▪ I/O Commands ▪ I/O Instruction ▪ Flowcharts • Interrupt driven I/O ▪ Interrupt processing ▪ Design Issues • Drawbacks of Programmed & interrupt I/O • Direct Memory Access ▪ DMA Functions • I/O channels & Processes ▪ Evolution of I/O Function ▪ Characteristics of I/O channels	10	20
UNIT-IV	5	Advance Architecture • Parallel Processing (SISD, SIMD, MISD and MIMD) • RISC and CISC ▪ Characteristics ▪ RISC Pipelining	10	20
Total			50	100

Text Books:

William Stallings "Computer Organisation and Architecture" , Prentice Hall PTR, 07-Aug-2003

Reference Books:

1. Jain, "Modern Digital Electronics", McGraw Hill, 2008
2. Morris Mano, "Computer System Architecture", Pearson Custom Publishing, 2001
3. Hwang, "Advanced Computer Architecture", Tata McGraw Hill Education, 2003
4. Michael J. Flynn, "Computer Architecture", Narosa Publishing, 1995
5. P.R. Devale, "Computer Organisation and Architecture", 2004

Branch: BCA	**Semester-III**
Subject Code: 3104	**Lecture: 04** **Credit: 04**
Subject Title	**File Structures and Database Management System**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Introduction to file system and Indexing and Hashing** • Meaning of file, types of file, organization of records in file • Concepts of index, Types of indexes • Ordered (SAM), HASHED • Types of ISAM • Primary, Cluster, Secondary • Concept of Multilevel indexes • B-tree, & B+ • Concept of HASHING • Types of Hashing (Static, Dynamic)	10	20
UNIT-II	2	**Query Processing and query optimization** • Meaning of Query • Steps in Processing Query • Translating SQL query into Relational Algebra, • Query tree and its notations , Initial tree, • Query equivalence, • Query expression – Materialization and Pipelining • Cost estimation / Measures of Query cost • Query optimization • Heuristics Algebra optimization	12	24
UNIT-III	3	**Transaction Processing** • Definition of Transaction • Transaction states-Diagram and explanation • Partially committed • Committed, Failed, Aborted • Properties of transaction(ACID) • Atomicity, Consistency, Isolation, Durability • Basic Transaction operations - Read, Write • Why Concurrency Control is needed? • Schedule, types of schedule (Serial, Non – serial, concurrent, recoverable, cascadeless, strict) • Serializability and conflict serializability • System log, Lost update problem,	12	24

		• Temporary update problem, • incorrect summary problem, Unrepeatable read , Active		
UNIT-IV	4	**Concurrency Control: Introduction** • Locks and types of locks • Compatibility Matrix • Conversion of locks – upgrading and downgrading • Starvation of lock • Deadlock handling – Deadlock detection methods, problems of deadlock, wait-die and wound-wait protocols, methods used to prevent deadlock, recovery of deadlock • Multiple granularity locking protocol • 2-phase locking protocol (2PL) • Timestamps – W-timestamp and R-timestamp • Thomas write rule	16	32
Total			50	100

Text Books:

1) Korth,Siberschatz,"Database System Concepts",McGraw-Hill,27-Jan-2010

References:

1) Elmarsi and Navathe,"Fundamentals of Database Systems",McGraw-Hill,2010
2) Bayross,"Oracle-the complete reference",Ivan: BPB Publications
3) "Upgrade to oracle 8",DataproInfoWorld Ltd.
4) GioWiderhold,"Database Design",McGraw-Hill 1995

Branch:BCA	**Semester-III**
Subject Code :3201	**Practical:02** **Credit:02**
Subject Title	**Microprocesor Lab**

Modules	Sr.No	Topic and Details	No of Lectures/Practicals Assigned	Marks Weightage %
Unit-I	1	Program to find addition of two 8-bit numbers	1	2
	2	Program to find subtraction of two 8-bit numbers	1	2
	3	Program to find addition of two 16-bit numbers	1	2
	4	Programs to find subtractiob of two 16-bit numbers	1	2
Unit-II	5	Program to find addition of two 16-bit BCD numbers	1	2
	6	Program to find subtraction of two 8-bit BCD numbers	1	2
	7	Program to find multiplication of two 8-bit numbers using successive addition method.	1	2
	8	Program to find multiplication of two 8-bit numbers using shift and add method	1	2
	9	Program to divide 16-bit number by an 8-bit number	1	2
Unit-III	10	Program to transfer a block of N bytes from source to destination	1	2
	11	Program to find Maximum number in an array	1	2
	12	Program to find Minimum number in an array	1	2
	13	Program to sort the numbers in ascending order	1	2
	14	Program to sort the numbers in descending order	1	2
	15	Program to convert two BCD numbers to their HEX equivalent	1	2
Unit-IV	16	Program to convert HEX number to BCD	1	2
	17	Write a sub routine for 8085 to generate delay of 100 ms	1	2
	18	Write a sub routine for 8085 to generate delay of 10 ms	2	4
	19	Write a program to generate Fibonacci series	2	4
	20	Study of Hardware Interrupts	2	4
	21	Study of Software Interrupts	2	4
Total			25	50

Text Books:

1. R.S.Gaonkar, "Microprocessor Architecture, programmimg and applications with the 8085/8085A",Wiley Eastern Ltd.,1995

References:

1. Peter Norton(Sixth Edition)"Inside the PC":,January 2005
2. Yu-Cheng Liu & Glen A,Gibson, "Microprocessor System-The 8086/8088 Family"
3. "The Intel Microprocessor:8086/80386,Pentium,Pentium Pro,Pentium–II & III": Barry Brey (Fourth Edition)

Branch:BCA	Semester-III
Subject Code:3202	Practical:02 Credit:02
Subject Title	Database Management System Lab

Module	Sr.No	Topic and Details	No of Lecturers/Practicals Assigned	Marks Weightage %
Unit-I	1	Data base creation, Table Creation	3	6
Unit-II	2	Operation on Databases like insertion, deletion, updation, searching, etc	2	4
	3	Using Joining and Relational Operation in commands	5	10
Unit-III	4	Implementation of Nested Queries	5	10
	5	Altering Table, and Fields	3	10
Unit-IV	6	Writing and defining Constraints	2	4
	7	Normalization and Multi table query execution	5	10
Total			25	50

Text and Reference Books:

1. Oracle 8i The Complete Reference: Loney, Koch

Branch: BCA	**Semester-IV**
Subject Code: 4101	**Lecture: 04** **Credit: 04**
Subject Title	**DATA STRUCTURES AND FILE ORGANISATION**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT -I	1	**Introduction:** Definition, Classification of Data Structures (Primitive and non Primitive), Description of various data structures, Arrays, Lists, Stacks, Queues, Trees and Graphs	4	8
	2	**Arrays:** One dimensional array, its Initialization, Implementation of One dimensional array in memory, Insertion, deletion of an element from one dimensional array, Traversing of an array	4	8
UNIT-II	3	**Linked Lists:** Introduction, Key terms, Advantages & disadvantages Linear linked lists ( ) • Types (Singly, Doubly, Circular) Operations (Inserting, Deleting nodes)	5	10
	4	**Stack:** Introduction, Stack implementation, Operations on stack (Push Pop), Implementation of stack using pointer, Applications of stack, Infix prefix, postfix notations, Algorithms for converting from one form to another	6	12
	5	**Queue:** Introduction and Queue implementation, Operations on queue (Insertion & deletion), Limitations of simple queue Circular queue, Double ended queue (dequeue), Application queue & its types	6	12
UNIT III	6	**Trees:** Introduction, terminology, Binary tree, Creation, Operations, Strictly Binary tree, Complete Binary tree Binary tree representation, As Array and Linked lists Traversal (Inorder, preorder, postorder)	6	12
	7	**Graphs:** Introduction, terminology, Graph representation, Applications of graph, Graph traversal (BFS, DFS, Shortest path), Spanning tree, Minimum spanning tree	6	12
	8	**Searching & Sorting:** Searching (Sequential, Binary) Sorting (Bubble sort , Selection sort , , Quick Sort, Heap sort, Insertion sort)	5	10
UNIT-IV	9	**Introduction to Files & Concept of Records:** Definition, Forming Records, Modes of Accessing Files, File Organization (Sequential, Relative, Direct Access, Indexed Sequential Access), Multi key Files, File systems, Primitive Operations on files (Open /Close, Read / Write Next, Read_Direct, Write_Direct, Update, Append, Allocate, Deallocate	4	8

	10	**Direct File Organisation:** Introduction, Hashing Function, Properties of good Hashing Function, Different types of Hashing Functions, Primitive Operations on Direct Files, File Functions	4	8
		Total	50	100

Text Books:

S.Sawhney & E. Horowitz, "Fundamentals of Data Structure", Computer Science Press, 1987

References:

1. Trembley & Sorrenson " Data Structure", 2005
2. Lipschuiz, "Data structures" , (Schaum's Outline Series Mcgraw Hill Publication)
3. Ellis Horowitz and Sartaj Sawhney "Fundamentals of Computer Algorithms"
4. Aho, Hopcroft and Ullman, "Data Structures and Algorithms"
5. Abhay Abhyankar, "Data Structures and Files"
6. G.S. Baluja "Data Structures Through C"
7. Mary E. S. Loomis, "Data Management and File Structures", Prentice Hall, 2nd ed. edition (January 1989)

Branch: BCA	**Semester-IV**
Subject Code: 4102	**Lecture: 04** **Credit: 04**
Subject Title	**INFORMATION SYSTEMS ANALYSIS AND DESIGN**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	Definition of the system, Characteristics, elements, Types of Systems, Business Information system, Categories of a system, Introduction to structured methods of analysis, Overview of System, Analysis and Design: Development life cycle (Waterfall, Spiral, Incremental Models)	5	10
	2	Role of a systems Analyst, Skills required to be system analyst, Requirement analysis, Role of user in requirement analysis	4	8
UNIT-II	3	Feasibility studies, Requirements determination, Logical design, Physical design, Program design, Risk and feasibility analysis, prototyping	4	8
	4	Feasibility Analysis: Definition, types of feasibility, steps of feasibility analysis, Feasibility report, Fact finding techniques (Interview Questionnaire, Record review and On site observation)	4	8
	5	Information requirement analysis: Process modeling with physical and logical data flow diagrams, Data modeling with entity – relationship diagrams, Normalization up to 3NF	6	12
UNIT-III	6	Tools of SSAD Structure chart, DFD, DD, Structured English, Decision table, Decision Tree (with examples) Input /output form / screen	5	10

		design		
	7	System design: Process descriptions Input/output controls, object modeling, Database design, User Interface design, Documentation, Data Dictionary	5	10
UNIT-IV	8	Development methodologies: Top down, bottom up, structured chart, decision table, decision tree, CASE productivity tools	6	12
	9	Testing – Unit, Integration, System, Acceptance, regression, Test Case generation, Methods of testing (WBT, BBT, Alpha, Beta testing) Implementation of a system, User training	6	12
	10	Case Studies	5	10
Total			50	100

Text Books:

1. SENN "Analysis and Design of Information System", McGraw- Hill, 1989

Refrences:

1. Awad, "System Analysis and Design:, R.D. Irwin, 1985
2. Khalkar, "System Analysis and Design"
3. Garg, "Workbook for System Analysis and Design" PHI Learning Pvt. Ltd., 2004
4. Gane and Sarson, "System Analysis and Design", Advanced System Incorporated, 1979

Branch: BCA	**Semester-IV**
Subject Code: 4103	**Lecture: 04** **Credit: 04**
Subject Title	**INTRODUCTION TO SOFTWARE ENGINEERING**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	Introduction Definition, need, software engineering methods, Tools, and procedures, Software Process: Software engineering layers, SEI-CMM, process framework, Development life cycle models: waterfall, spiral, iterative, enhancement and phased development, RAD model, Component based development model, Prototyping model, Overview, various phases, analysis, design, development and implementation.	5	10
	2	Software project planning : Overview, objectives, scope, resources.	3	6
UNIT-II	3	Cost Estimation Techniques: Metrics for software productivity and quality Productivity metrics: direct and indirect methods, size and function oriented metrics, Decomposition techniques: LOC and	5	10

		FP estimation, Effort Estimation: Overview, COCOMO, putnam, esterling models, automated Estimation tools. Configuration and Administration: virtual hosting		
	4	Software Project Scheduling: Task definition and parallelism, effort distribution, scheduling Methods: PERT and CPM, Software project plan outline Software prototyping : Overview, steps, methods, tools, specification, guidelines	5	10
UNIT-III	5	Requirement analysis methods: introduction, methods Object oriented, data flow and data structure oriented, comparisons, application results, automated tools, Software design : Methods: iterative, top-down, bottom-up	5	10
	6	Design representations: flow charts, pseudo code, HIPO and techniques, Modular design: Overview, module coupling and cohesion, various types of coupling, merits and demerits, other approaches to programming.	6	12
	7	Software implementation: Issues, concept of programming support environment, Risk Management, Software testing Overview, Various tests and methods: top-down, bottom-up, Debugging: definition, techniques and strategies, exhaustive testing, classification, cyclomatic complexity, Overview, integration of hardware and software components	6	12
UNIT-IV	8	Strategies software configuration management, Management activity, planning, monitoring, Controlling, resource management.	5	10
	9	Product assurance: overview, quality assurance , Software quality assurance: definitions for software quality, various types, trade-offs, , verification and validation.	5	10
	10	Configuration management: identification, control, auditing, status accounting, overview, definition, V and V life cycle.	5	10
Total			50	100

Text Book:

1. Pressman "Software Engineering A Practitioner's Approach" McGraw-Hill, 5th Edition, 2005

References:

1. Shooman "Software Engineering Design, Reliability and Management" McGraw Hill 1983

2. Fairley "Software Engineering Concepts" " McGraw--Hill Series, New York, 1985

Branch: BCA	**Semester-IV**
Subject Code: 4104	**Lecture: 04** **Credit: 04**
Subject Title	**OBJECT ORIENTED PROGRAMMING USING C++**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Introduction**: Introduction of POP, Principals of Object Oriented programming, Differentiate and OOP, Object oriented programming paradigm, Basic Concept of Object oriented programming, Benefits of OOP, Beginning with C++,Applications of C++, Program features, Comments, Output operator, Input operator, Iostream File, Cascading of I/O operators, Structure of C++ program, Client server model, Tokens Expression and Control Structures, Basic data types, User define data type, Derived data types, Symbolic constants, Declarations of variables, Dynamic initialization of variables, Reference variables	4	8
	2	**Operators in c++:** Scope resolution operator, Memory Managements operators, Manipulators, Type cast operator, Expressions and their types, Implicit conversions, Control Structures: If statements, Switch statements, Loop Statements, Functions in C++: Main function, function proto type, Call by reference, return by reference, Inline functions, Default arguments, Const Arguments, Function overloading.	4	8
UNIT -II	3	**Classes and Object**: Memory Allocation for objects • Arrays of objects • Objects as function Arguments • Friend functions • Returning objects • Const Member functions • Pointers to members	4	8
	4	**Constructors and Destructors:** Constructors (Parameterized Constructors, Multiple constructors in a class, Constructors with default arguments, Copy constructors, Dynamic constructors), Destructors	6	12
UNIT -III	5	Operator Overloading (Unary, Binary, Using Friend Functions, Manipulations of strings using operators, Rules).	6	12
	6	**Inheritance , Pointers virtual functions and Polymorphism:** Inheritance (Defining derived classes, Single Inheritance, Making a Private member inheritable, Visibility of inherited Members, Multilevel Inheritance, Hierarchical inheritance, Hybrid inheritance, Virtual base class, Abstract class, Constructors in derived classes, Nesting of classes Pointers.	6	12
UNIT -IV	7	**Managing Console I/O Operations and Working with files:** C++ Stream and Classes, Unformatted I/O operations, Put(), get(), getline(), write(), Formatted console I/O operations, Ios class functions and flags, Manipulators, User defined output functions.	4	8
	8	**File Handling:** Classes for file stream operations, Opening and Closing files, Detecting End of file, File modes, File Pointers and their manipulations, Sequential input and output operations, Reading and writing class object, Command line arguments	6	12

	9	**Templates:** Class template, Class template with multiple parameters, Function template, Function template with multiple parameters, Overloading of Function template, Member function template, Non- Type template argument.	5	10
	10	**Exception Handling:** Basics of Exception Handling, Exception Handling, Mechanism, Throwing mechanism, Catching mechanism, Multiple catch statements, Catch all exceptions, Rethrowing Exceptions, Specifying exceptions	5	10

Text Books:

1. E. Balgurusam, "Object Oriented Programming using c++", Tata McGraw-Hill Education 01-Jan-2006

Reference:

1. K.R Venugopal "Mastering C++", Tata McGraw-hill
2. B.stroustroup Addison Welsey "C++ Programming Language", 1997
3. B. Chandra "A Treatise on Obejct Oriented Programming using C++"
4. Herbert Schildt, " The Complete Reference C++", Tata McGraw-Hill ,2001

Branch: BCA	**Semester-II**
Subject Code: 4201	**Lecture: 02** **Credit: 02**
Subject Title	**DATA STRUCTURES LAB**

Modules	Sr.No.	**Topic and Details**	No. of **Lectures/ Practicals** Assigned	Marks Weightage %
UNIT-I	1	**Arrays:** Implementations of Array and Operations- Insertion, deletion of an element from one dimensional array, Traversing of array	2	4
	2	**Linked Lists: Singular** Implementation of List and Linked List and Operations- Inserting, Deleting of nodes etc	2	4
UNIT-II	3	**Linked Lists:** Implementation of Two way Doubly and Circular Linked List and Operations- Inserting, Deleting nodes etc	3	6
	4	**Stack:** Stack Implementation, Operations on stack(Push Pop). Implementation of stack using pointer, Applications of stack, Infix, prefix, postfix, converting from one form to another	4	8
UNIT-III	5	**Queue:** Implementation of Queue Implementation, Operations on queue(Insertion and deletion)	3	6
	6	**Trees:** Implementation of tree as Array and Linked lists and Travesal (Inorder, Preorder, postorder)	4	8

UNIT-IV	7	**Graphs**: Implementation of Graph traversal (BFS, DFS Shortest path)	3	6
	8	**Searching & Sorting:** Implementation of searching (Sequential, Binary search) Sorting (Bubble sort, Selection sort, Quick sort etc)	4	8
Total			25	50

Branch: BCA	**Semester-II**
Subject Code: 4202	**Lecture: 02** **Credit: 02**
Subject Title	**OBJECT ORIENTED PROGRAMMING C++ LAB**

Modules	Sr.No.	**Topic and Details**	No. of **Lectures/ Practicals** Assigned	Marks Weightage %
UNIT-I	1	**Introduction:** Simple Programs on fundamental Data Types and I/O operators, Derived data types, Symbolic constants, variables and reference Variables	2	4
	2	**Operators and decision control structures:** Programs to implement If statements, Switch statements, Loop statements Functions in C++: Main function, function prototype, Call by reference, return by reference, Inline functions, Default arguments, Const Arguments, Function overloading	2	4
UNIT-II	3	**Classes and Object:** Programs for memory allocations for objects, Arrays of objects, Objects as function Arguments, Friend functions, Returning objects, Const Member functions, Pointers to members	2	4
	4	**Constructors and Destructors:** Implementation of Constructors(Parameterized Constructors, Multiple constructors in a class, Constructors with default arguments, Copy constructors, Dynamic constructors)Destructors	2	4
UNIT-III	5	Programs for Operator Overloading (Unary, Binary, Using friend functions etc)	3	6
	6	**Inheritance, Pointers virtual functions and polymorphism :** Programs for Inheritance Single, Multiple, Multilevel, Hierarchical inheritance, Hybrid inheritance, Virtual base class, Abstract class, Constructors in derived classes, Nesting of classes	3	6
UNIT-IV	7	**Programs for Managing Console I/O Operations and working with files:** C++ Stream and Classes, Unformatted I/O operations, Put(),get(),getline(),write(), Formatted console I/O operations , Ios class functions and flags, Manipulators, User defined output functions.	3	6
	8	**File Handling:** Implementation of Opening and closing files, Detecting End of file, File modes, File pointers and their manipulations, sequential input and output operations,	2	4

		2Reading and writing class object, Command line arguments.		
	9	**Templates:** Implementation of Class template, Class template with multiple parameters, Function template	4	8
	10	**Exception Handling:** Implementation of try, catch and throw statement for handling the exceptions.	2	4
Total			25	50

Text Book:

1. K.R Venugopal 'Mastering C++', Tata Mcgrawlhill, 1997

References:

1. B.Stroustroup 'C++ Programming Language' (3rd Edition). Addison Wesley, 1997
2. B.chandra Narosa 'A Treatise On Object Oriented programming using C++'- Publications, 1998
3. Herbert Schildt, "The Complete Reference CN", Tata McGraw-Hili, 2001.

Branch: BCA	**Semester-V**
Subject Code: 5101	**Lecture: 04** **Credit: 04**
Subject Title	**DATA COMMUNICATIONS AND NETWORKING**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	Fundamentals of communication. Ways of communication.	5	10
	2	Analog / Digital Transmission, Synchronous/ Asynchronous Transmission.	5	10
	3	Modulation Techniques (AM,FM,PM, Pulse), Shift keying, Encoding techniques.	5	10
UNIT-II	4	Transmission Media (Twisted pair, Coax Cable, Optical fiber, Wireless Media(terrestrial, microwave, satellite)	5	10
	5	Transmission medium impairments, Multiplexing (TDM,TDMA, FDM)	5	10
	6	Channel Allocation-Static, Dynamic, Switching techniques (Circuit, Message, Packet, Hybrid)	5	10
UNIT-III	7	Fundamentals of Networking, Transporting digital information-framing, sequencing, packaging, reassembling.	5	10
	8	Network Models- Layered approach with concepts of ISO,OSI,RM,TCP/IP.	5	10
UNIT-IV	9	Network issues- framing, error control, flow control, routing with various algorithms, congestion control. Types of services-connection and reliability.	5	10
	10	Concepts of collisions- Slots, carrier sense, Medium Access Protocols- Aloha, Slotted Aloha, CSMA,CSMA/CD.	5	10
Total			50	100

Text Book:

W. Stallings "Data and Computer Communications", 7th Edition, Prentice Hall, 2004

References:

1. Forouzan, "Data Communication and Networking," 3rd Edition, McGraw Hill, 2003
2. A.S.Tannenbaum,"Computer Networks**",** 4th edition Printice Hall of India

Branch: BCA	**Semester-V**
Subject Code: 5102	**Lecture: 04** **Credit: 04**
Subject Title	**Java Programming**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Introduction and Programming with java: Introduction to java:** Creation of java, Difference between java & C++. Java's Magic: Byte Code, JVM, Run time Environment, Just-in-time, Compiler, JDK, Buzzwords/Features, OOP Principles, Data Types & Operators, Simple Data Types, Variables, Declaring Variables, Dynamic Initialisation, Scope & Life time, Type conversion & Casting Incompatible Types. Arrays: one, Multi-dimensional, Arithmetic, Modulus Assignment, Increment & Decrement, Relational Boolean – Logical operators. Control Statements- All Control Statements, Jump Statement. Classes & Objects: Class Fundamentals- General form,Simple class, Declaring Objects, Assigning Object reference variables	5	10
	2	**Constructor & Methods:** Introduction to Methods, Constructor, Types of Constructors, This keyword, Garbage Collection, Finalise() method, A stack Class	4	8
UNIT-II	3	**Method Overloading :** Overloading Methods, Using Object as Parameters, Argument Passing, Returning Objects, Recursion, Understanding Static, Introducing to Final, Inner & Nested Classes, Inheritance & Method Overridding, Dynamic Method dispatch, Abstract Classes, Final With Inheritance	6	12
	4	**Special Features of java:** Interface & packages, Packages ccess Protection, Importing Package , Interface.	3	6
	5	**Exception Handling:** Fundamentals, Exception Types Uncaught Exception, Using try catch, Multiple Catch, Nested try, throw, throws, finally, java's Built-in-exception, creating own exception subclasses, chained exception, using exception	4	8
UNIT-III	6	**Threading:** Thread Model, Thread priorities, synchronization, Messaging, The thread class and runnable……. The main Thread, Creating a thread, Implementing ……Multi thread, using isAlive() & join().	5	10
	7	**I/O Applets:** The I/O Classes, I/O Basics, Streams, Byte Streams and character streams, Byte stream, classes and character stram classes, Byte Stream class, Buffered InputStream, BufferedOutputStream, ByteArrayInput, ByteArrayOutput, DataInput, DataOutput, printStream, Character Stream Class, BufferedReader, BufferedWriter, InputStreamReader, OutputStreamWriter, PrintWriter, Reading Console Input, Writing Console output.	5	10

	8	**Applet:** Fundamentals/Basics, Applet Initialisation and Termination, Init(), Start(), Paint(), Stop(), Destroy(), Overriding update(), Simple Applet Display Methods(), Repainting, Using Status window, The HTML Applet tag, Passing parameters to Applets.	6	12
UNIT-IV	9	**The Java Library:** String Handling- length(),equals(), charAt(), toString(), getchar(), compareTo(), indexOf(), lastIndexOf(), concat(), valueOf(), substring(), replace(), trim(), toUpperCase(), toLowerCase(), Networking- Networking Basics, Socket overview, Client/Server, Reserved Socket, Internet Addressing, DNS, Java & The Net, Networking classes and interfaces- InetAddress, Factory Methods, Instance Methods, TCP/IP client sockets, whois URL, Format URL connection, TCP/IP Server sockets, Datagrams, DatagramPacket, Datagram server and client, The Collections Framework, Collections Overview, Collections Interfaces, The collection Interface, The list Interface, Set Interface, Sorted Set Interface.	6	12
	10	**The AWT & Layout Managers:** Control fundamentals, Adding & Removing controls, Responding to controls, Using Buttons, ActionListener, itemsStateChanged(), Choice Control, Handling choice Lists, Using Lists, Handling Lists, Managing Scroll bar, Textfield, Using TextArea LayOut Manager-Flow, Border Grid, Card Using Insets, Event Handling –Events, Event Sources, Event Listeners, Event Classes(In details)-	6	12
Total				

Text Book:

1. Herb Schildt "Java 2 the Complete Reference J2se", 5TH Edition , 2003

References:

1. "Java Enterprise in a Nutshell: A Desktop Quick Reference": (Nutshell Handbook)
2. Elliot B. Koffman, "Problem Solving with Java", Temple University Ursula Wolz, College of New Jersey, Copyright 1999, 848 pp. ISBN 0201357437.
3. Jan Skansholm, "Java from the Beginning", Chalmers University of Technology, Sweden, Copyright 2000, 540 pp. ISBN 0201398125.

Branch: BCA	**Semester-V**
Subject Code: 5103	**Lecture: 04** **Credit: 04**
Subject Title	**Visual and Database Programming**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	Introduction to .NET, .NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET-Menu bar, toolbar, Solution	4	8

		Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser.		
	2	The environment: Editor tab, format tab, general tab, docking tab, visual development & event drive Programming- Methods and events.	4	8
UNIT-II	3	The VB.NET Language- Variables- Declaring variables, Data Type of variables, Forcing variable, declarations, Scope & lifetime of a variable, Constants, Arrays, types of array, Control array, Collections.	2	4
	4	Subroutines, Functions, Passing Variable Number of Argument, Optional Argument, Returning value from function, Control flow statements : conditional statement, loop statement, Msgbox & Inputbox.	5	10
UNIT-III	5	Working with Forms: Loading, showing and hiding forms, controlling One form within another, GUI Programming with Windows Form: Textbox, Label, Button, Listbox, Combobox, Checkbox, Picturebox, RadioButton, Panel, scroll bar, Timer, ListView, TreeView, Toolbar, StatusBar. There properties, Methods and events. OpenFileDialog, SaveFileDialog, FontDilog, ColorDialog, PrintDialog, Link Label, Designing menus: ContextMenu, access & shortcut keys.	5	10
	6	Object oriented Programming : Classes & objects, fields Properties, Methods & Events, constructor, Inheritance, Access Specifiers: Public, Private, Projected, Overloading, My Base My class keywords.	6	12
	7	Overview of OLE, Accessing the WIN32 API from VB.NET & Interfacing with office97, COM technology,advantages of COM+, COM & .NET, Create User control, register User Control, access com components in .net application.	6	12
UNIT-IV	8	Database Programming with ADO.NET-Overview of ADO, from ADO .NET,Accessing Da using Server Explorer, Creating Connection, Command, Data Adapter and Data set with OLEDB and SQLDB. Display Data on data bound controls, display data on data grid.	6	12
	9	Fetching Record Sets and Operations , Insertion, Updation, navigation, selection etc	6	12
	10	Report Generation (Crystal report on Data report or any third party Report Tool which can be configured with VB)	6	12
Total			50	100

Text and Reference Book:

1. VB.NET Programming Black Book Steven Holzner- Dreamtech Publications.
2. Mastering VB.NET by Evangelos Petroutsos- BPB publications
3. Introduction to .NET framework- Worx publication
4. Msdn.microsoft.com/net/
5. www.gotdotnet.com
6. GOTTFRIED BYRON S.,Ed:01, "VISUAL BASICS"- Tata McGraw Hill 2nd edition
7. Greg Perry, " Visual Basic in 21 days ", Sams 1998.
8. Prosenjit Shina, " Visual Basic Complete", S.Chand & Company Limited 2005
9. Julia Bradely, " Visual Basic 6"

Branch: BCA	**Semester-V**
Subject Code: 5104	**Lecture: 04** **Credit: 04**
Subject Title	**Internet Programming**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	Introduction to web. HTTP Overview: HTTP Basics, Client request, Server response; HTTP Headers; Session Management- Persistent connections, cookies.	2	4
UNIT-II	2	General concepts on web server: Configuration and Administration ; virtual hosting. General concepts of catching proxy server Web security, Digital signatures, Digital Certificates, Encryption , and Authentication.	2	4
UNIT-III	3	HTML: Structure of HTML Document- Meta tags, Links, Text, Lists, Tables, Inclusion (Objects , Images, and Multimedia contents); Presentation of HTML document- Style sheets, Alignment , fonts, frames; Interactive HTML document- Forms, Scripts(as scripting is included in part II, should not have space in part I.	10	20
UNIT-IV	4	JAVA SCRIPT – JS Basic – Variables, If…Else, Switch, Operators, JS Popup Boxes, Functions, For loop, While Loop, Break Loops, For ….In, Events, Try….catch , Throw, on error, Special Text Objects, String, Date, Array, Boolean, Math, JS HTML DOM, JS Advanced, JS Browser, JS Cookies, JS Validation, jJS Animation, JS image Maps, JS Timing, js Create Object.	11	22

Text Books:

1. "Javascript Bible" Danny Goodman, Michael Morrison, Yiley dreamtech India Pvt. Ltd.
2. "HTML the complete reference" Thomas A Powell, Tata Mcgraw Hill.

Reference Books:

1. HTML: Chuck Musciano and Bill Kennedy, O'Reilly and Associates "The Definitive Guide": 3rd Edition
2. David Flanagan "JavaScript: The Definitive Guide ", **O'Reilly - January 2002**
Kent and Multer "Official Netscape JavaScript 1.2 Programmer's Reference." Netscape-specific book by (© 1997, ISBN: 1566047579).

Branch: BCA	**Semester-V**
Subject Code: 5201	**Lecture: 02** **Credit: 02**
Subject Title	**Java Programming Lab***

Modules	Sr.No.	**Topic and Details**	No. of **Lectures/ Practicals** Assigned	Marks Weightage %
UNIT-I	1	**Introduction and Programming with java:** Implementation of Data Types, Type conversion & Casting, Java Automatic Conversions, Casting Incompatible Types, Arrays: one, Multi-dimensional, Arithmetic, Modulus Assignment, Increment & Decrement, Relational Boolean – Logical operators. Control Statements- All Control Statements, Jump Statement. Classes & Objects: Class Fundamentals- General form, Simple class, Declaring Objects, Assigning Object reference variables.	2	4
	2	**Implementation of Constructor & Methods:** Constructors, This keyword, Garbage Collection, Finalise() method, A stack Class	2	4
UNIT-II	3	**Implementation of Method Overloading:** Overloading Recursion, Static, Inheritance & Method Overriding: Basics, Using Super, Multilevel, Overriding, Dynamic Method dispatch, Abstract Classes.	3	6
	4	**Special Features of java:** Interface & packages, Packages Access Protection, Importing Package, Interface.	3	6
UNIT-III	5	**Exception Handling:** Implementation of try catch, Multiple catch , Nested Try, throw, throws, finally statements Java's Built-in- Exception	3	6
	6	**Implementation of threading:** Single and Multiple thread	3	6
	7	**I/O Applets:** Implementation of I/O functions	3	6
UNIT-IV	8	**Applet:** Implementation of Applet- Initialisation and Termination, Init(), Start(), Paint(), Stop(), Destroy(), Overriding update(), Simple Applet Display Methods(), Repainting, Using Status window, The HTML Applet tag, Passing parameters to Applets.	3	6
	9	**The Java Library:** Implementations String Handling functions	3	6
	10	**Implementation of AWT & Layout Managers:** Control fundamentals, Adding & Removing controls, Responding to controls, Using Buttons, Listeners.	3	6
Total			25	50

Text Book:

Herb Schildt "Java 2 the Complete Reference J2se", 5TH Edition , 2003

References:

1. Jim Farley, William Crawford, David Flanagan,"Java Enterprise in a Nutshell: A Desktop Quick Reference": (Nutshell Handbook)
2. Elliot B. Koffman, "Problem Solving with Java", Temple University Ursula Wolz, College of New Jersey, Copyright 1999, 848 pp. ISBN 0201357437.
3. Jan Skansholm, "Java from the Beginning", Chalmers University of Technology, Sweden, Copyright 2000, 540 pp. ISBN 0201398125.

Branch: BCA	**Semester-V**
Subject Code: 5202	**Lecture: 02** **Credit: 02**
Subject Title	**Internet Programming Lab**

Modules	Sr.No.	**Topic and Details**	No. of **Lectures/ Practicals** Assigned	Marks Weightage %
UNIT-I	1	**HTML:** Structure of HTML Document, Formatting Text,- Headers- Formatting Tags- Pre tag- font Tag(Alignment), - Text area, - Special Character Meta tags, Working with images, Links, Anchor Tag Lists- Unordered List, Ordered Lists, Definition List **Tables** • Table, TR and TAG Tag • Cell Spacing and Cell Padding • Colspan and Rowspan Inclusions(Objects, Images and multimedia contents) Presentation of HTML document- Style sheets, Types of Style sheet Frames • Frameset, Frame tag, NoFrames Tag • Interactive HTML document- Form, Form and Input Tag, Text Tag, Radio Button, Checkbox, Select Tag and pull down lists, Hidden, Submit and Reset.	5	10
UNIT-II	2	JAVA SCRIPT- JS Basic : Javascript Variables and Data Types • Declaring Variables, Data Types, Statements and Operators Control Structures • Conditional Statements, Loop Statements Popup Boxes/ Message Box in javascript • Alert Boxes, Conform Boxes, Prompt Boxes	2	4
UNIT-III	3	Object-Based Programming, Functions Objects (String, Date, Array, Boolean, Math)	3	6
UNIT-IV	4	JavaScript with HTML • Event, Event Handlers • Try..Catch, Throw, on error,	15	30

	5	JS Advanced, JS Browser, JS Cookies, JS Validation JS Animation , JS image Maps, JS Timing, JS Create Object.		
Total			25	50

Text Books:

1. "Javascript Bible" Danny Goodman, Michael Morrison, Yiley dreamtech India Pvt. Ltd.
2. "HTML the complete reference" Thomas A Powell, Tata Mcgraw Hill.

Reference Books:

1. Chuck Musciano and Bill Kennedy, O'Reilly and Associates HTML: "The Definitive Guide": 3rd Edition
2. David Flanagan "JavaScript: The Definitive Guide ", **O'Reilly - January 2002**
Kent and Multer "Official Netscape JavaScript 1.2 Programmer's Reference." Netscape-specific book by (© 1997, ISBN: 1566047579).

Branch: BCA	**Semester-VI**
Subject Code: 6101	**Lecture: 04** **Credit: 04**
Subject Title	**Management Information System**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	Introduction to Systems and Basic Systems Concepts. Systems Approach , Types of Systems,	5	10
	2	Information Systems: Definition and Characteristics. Information Concepts, Attributes of Information , Methods to avoid misuse of Information	5	10
	3	Information- A quality product, Types of information, Methods of data & information collection, Role of Information in decision making, General model of human as a information processor	6	12
UNIT-II	4	MIS & Information concepts, Subsystems of information system: EDP, MIS & Information concepts, DSS	6	12
	5	An overview of Management Information System: Definition and Characteristics, Components of MIS. Frame Work for Understanding MIS: Robert Anthony's Hierarchy of Management Activity, Information require-ments	6	12
UNIT-III	6	Levels of Management, Simon's Model of decision-Making, Concept of decision making: Structured Vs Unstructured decisions, Knowledge of outcomes, Criteria of decision making ,Formal vs. Informal systems.	6	12
UNIT-IV	7	Developing Information System: Analysis OF INFORMATION SYSTEM and Design of Information System	6	12
	8	Implementation of information system, Evaluation, pitfalls in MIS developments	5	10
	9	Functional MIS: A Study of Marketing, Personnel, Financial and Production MIS.	5	10
Total			50	100

Text Book:

1. W.S. Jawadekar, "Management Information Systems," Tata McGraw Hill Publishing, 2004.

REFERENCES

1. V. Rajaraman, "Analysis & Design of Information System," PHI.
2. J. Kanter, "Management/Information Systems", PHI, 1996
3. Gordon B. Davis & M.H. Olson, "Management Information Systems: Conceptual Foundation, structure and Development" 1984.
4. K Rajeshwar Rao "Management information Syatem ", Himalaya Publication
5. D.P. Goyal, "MIS; Management Perspectives", 2006

Branch: BCA	**Semester-VI**
Subject Code: 6102	**Lecture: 04** **Credit: 04**
Subject Title	**Enterprise Resource Planning**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	Introduction to ERP: An Overview, Integrated management Information, Seamless Integration, Supply Chain Management, Resource Management, Integrated Data Modeling, Scope**,** Technology, Benefits of ERP, Evolution, ERP and the Modern Enterprise	6	12
	2	Business and ERP Business Engineering	4	8
UNIT-II	3	Significance, Principles BRP ERP and IT	4	8
	4	Business Engineering with Information Technology	4	8
	5	ERP and Management Concerns	5	10
UNIT-III	6	Business Modeling for ERP	5	10
	7	ERP Implementation, Role of Consultants, Vendors and User Customization	5	10
	8	Precaution, ERP post implementation Options	5	10
UNIT-IV	9	Methodologies and guidelines for ERP Implementations	6	12
	10	ERP and Competitive Advantages, Overview , ERP AND THE Competitive Strategy	6	12
Total			50	100

Text Book :

V.K. Garg and N.K.Venkitakrishnan "ERP : Concepts and Planning" PHI , 1998

References:

Alexis Leon, "ERP", Tata McGraw – Hill Education

Branch: BCA	**Semester-VI**
Subject Code: 6103	**Lecture: 04** **Credit: 04**
Subject Title	**Intelligent Property Rights, Patents and Cyber Laws**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Intelligent Property Rights:** Basic Principle and Acquisition of Intellectual Property Rights: Philosophical Aspects of Intellectual Property laws, Basic Principles of Patent Law, Patent Application procedure, Drafting of Patent Specification, Understanding Copyright Law, Basic Principles of Trade Mark, Basic Principles of Design Rights, International Background of Intellectual Property.	5	10
	2	**Information Technology Related Intellctual Property Rights: Computer Software and Intellectual Property-** Objective, Copyright Protection, Reproducing, Defences, Patent Protection. **Database and data Protection-** Objective, Need for protection, UK Data Protection Act, 1998, US Safe Harbor Principle, Enforcement. **Protection of Semi-conductor Chips**- Objectives justification of protection, Criteria, Subjectmatter of Protection, WIPO Treaty, TRIPs, SCPA. **Domain Name Protection**-Objectives, domain name and intellectual Property, Registration of domain names, disputes under intellectual Property Rights, Jurisdictional Issues and International Perspective.	5	10
UNIT-II	3	**Patents (Ownership and Enforcement) –** Patents – Objectives, Rights, Assignments, Defence in case of Infringement	5	10
	4	**Copyright (Ownership and Enforcement) –** Copyright – Objectives, Rights, Transfer of Copyright, work of employment Infringement, Defences for Infringement	5	10
	5	**Trademark (Ownership and Enforcement) – Trademark –** Objectives, Rights, Protection of good will, Infringment, Passing off, Defences. **Designs-** Objectives, Rights, Assignment, Infringments, Defences of Design Infringment	5	10
UNIT-III	6	**Enforcement of Intellectual Property Rights –** Civil Remedies, Criminal Remedies, Border Security measures. **Practical Aspects of Licensing**- Benefits, Determinative factors, important clauses, licensing clauses	5	10
	7	**Cyber Law: Basic Concepts of Technology and Law:** Understanding the technology of Internet, Scope of Cyber Laws, Cyber Jurisprudence. **Law of Digital Contracts:** The Essence of Digital Contracts, The system of digital signature, The Role and Function of certifying Authorities, The Science of Cryptography.	5	10

UNIT-IV	8	**Cyber Law: Information Technology Act 2000:** Information Technology Act 2000-(Sec 1 to 94)	5	10
	9	**Cyber Law:** **Intellectual Property Issues in Cyber Space:** Copyright in the Digital Media, Patents in the Cyber World. **Rights of netizens and E-Governance:** Privacy and Freedom Issues in the Cyber World, E-Governance, Cyber Crimes and Cyber Laws, Ethical Hacking.	5	10
	10	**Cyber Law: Cyber Law Issues for Management: Cyber** Law Issues in E-Business Management, Major Issues in Cyber Evidence Management	5	10
Total			50	100

Text and Reference Books:

1. Cyber law by Vivek Sood
2. Licensing Art & Design by Caryn R. Leland, Allworth Press
3. A Professional's Guide to Licensing and Royalty Agreements by Caryn R. Leland, Allworth Press
4. IT2000 Bill
5. How to Register Your Own Copyright by Marx Warda, Sphinx Publishing
6. Web sites: online information, handouts

Branch: BCA	**Semester-VI**
Subject Code: 6104	**Lecture: 04** **Credit: 04**
Subject Title	**Elective-1 E-Commerce**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Electronic Commerce:** Overview, Definitions, Advantages & Disadvantages of E-Commerce, Threats of E-Commerce, Managerial Prospective, Rules & Regulations For Controlling E-Commerce, Cyber Law Technologies : Relationship between E-Commerce & Networking, Different Types of Networking for E-Commerce, Internet, Intranet & Extranet, EDI Systems.	6	12
	2	**Wireless Application Protocol:** Definition, Hand Held Devices, Mobility & Commerce, Mobile Computing , Wireless Web, Web Security, Infrastructure Requirement for E-Commerce.	6	12
UNIT-II	3	**Business Models of e-commerce**: Models based on Transaction Type, Model based on Transaction Party- B2B, B2C, C2B, E-Governance.	4	12
	4	**E- Strategy:** Overview, Strategic Methods for developing E-commerce.	2	

	5	**Four C's : (Convergence, Collaborative Computing, Content Management & Call Center):** Convergence : Technological Advances in Convergence- Types, Convergence and its implication, Convergence and electronic commerce.	8	16
UNIT-III	6	**Supply Chain Management :** E-logistics, Supply Chain Portal, Supply Chain Planning Tools (SCP Tools). Supply Chain Execution (SCE), SCE – Framework, Internet's effect on Supply Chain Power.	8	32
	7	**E-Payment Mechanism**: Payment through card system, E-Cheque, E-Cash, E-Payment Threats & Protections, E-Marketing. Home- Shopping, Tele Marketing Electronic Data Interchange (EDI): Meaning, Benefits, Concepts, Application, EDI Model, Protocols (UN EDI FACT/ GTDI, ANSI X- 12), Data Encryption (DES/RSA).	8	
UNIT-IV	8	**Risk of E**- Commerce: Overview, Security for E- Commerce, Security Standards, Firewall, Cryptography, Key Management, Password Systems, Digital certificates, Digital Signatures.	8	16

Text Books:

1. E-Commerce, M.M.Oka, EPH
2. Kalakotia Whinston : Frontiers of Electronic Commerce, Pearson Education.
3. Bhaskar Bharat: Electronic Commerce- Technologies & Applications TMH.
4. Loshin Pete, Murphy P.A. : Electronic Commerce, Jaico Publishing Housing.
5. Murthy: E-Commerce, Himalaya Publishing.
6. E-Commerce : Strategy Technologies & Application, Tata McGraw Hill
7. Global E- Commerce, J. Christopher & T.H.K. Clerk, University Press.
8. Beginning E-Commerce, Reynolds, SPD
9. Krishnamurthy, E-Commerce Mgmt, Vikas.

Branch: BCA	**Semester-VI**
Subject Code: 6104	**Lecture: 04** **Credit: 04**
Subject Title	**Elective-2 Artificial Intelligence**

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	Introduction**:** Intelligence Agents, Agents and Environment, Good Behavior : The Concept of Rationality, Performance measures, Rationality, Omniscience, learning, and autonomy. The nature of environments, Specifying the task environment, Properties of task environments.	5	10
	2	Solving Problem by searching: Problem Solving Agents, Well- Defined problems and solutions, formulating problems 3.2 Example problems, Toy Problems, Real world problems, searching for solutions, Measuring problem solving performance, Uniformed search strategies, Breadth	6	12

		first search, Depth first search, Depth limited search, Iterative depending depth first search, Bidirectional search, Comparing uniformed search strategies.		
UNIT-II	3	Informed Search and Exploration: Informed search Strategies, Greedy best first search, A* search, A* search : Minimizing the total estimated solution cost, Memory bounded heuristic function, The effect of heuristic accuracy on performance, Inventing admissible heuristic functions, Learning heuristic from experience 4.3 Local search algorithms and optimization Problems, Hill-Climbing search, simulated annealing search, local beam search, genetic algorithm	6	12
	4	Adversarial Search: Games, Optimal Decision in games, Optimal strategies, The minimax algorithm, Optimal decision in multiplayer games, Alpha Beta Pruning, 5.4 Imperfect, Real time decision, Evaluation functions, Cutting of Search.	5	10
UNIT-III	5	Logic Agents: Knowledge based agents, The Wumpus world, Logic Propositional logic: A very simple logic, Propositional logic: A very simple logic, Syntax, Semantics, A Simple Knowledge base, Inference, Equivalence, validity and satisfiability, Reasoning patterns in propositional logic, Resolution, Forward and backward chaining	6	12
	6	First Order Logic: Representation Revisited, Syntax and semantics of First order logic, Model for first order logic, symbol and interpretation, Terms, Atomic Sentence, Complex Sentence, Quantifier, Equality, Using first order logic, assertion and quries in first order logic, The kinship domain, Number Sets and lists, The Wumpus world	6	12
UNIT-IV	7	Learning from Observation: Forms of learning, Inductive learning, learning Decision trees, Decision tres as performance elements, Expressiveness of decision tree, Inducing decision tress from examples, Choosing attributes tests, Assessing the performance of the learning algorithm, Essemble learning.	8	16
	8	Knowledge in learning: A logic formulation of learning, Examples and hypotheses, Current best hypothesis search, knowledge in learning, Some simple examples, some general schemes, Explanation based learning, Extracting general rules from examples, Improving efficiency	8	16
Total			50	100

Text Book:

1. Stuart Russwll, Peter Norvig, "Artificial Intelligence (A Modern Approach)", Second Edition, Pearson Education, Limited, 01-Mar-2005.

References:

1. N.P. Padhy " Artifical Intelligence and Intelligence Systems" Oxford University Press 21-APR 2005

2. Patrick Henry Winston, " Artificial Intelligence" 1921
3. George F. Luger, " Artificial Intellligence (Structure & Strategies for Complex Problem Solving)
4. Rich & Knight, " Artificial Intelligence", McGraw- Hill 1991
5. Neeta Deshpande, " Artificial Intelligence", Technical Publication- Pune.

Branch: BCA	**Semester-VI**
Subject Code: 6104	**Lecture: 04** **Credit: 04**
Subject Title	**Elective-3 Web Technology**

6.

Modules	Sr.No.	**Topic and Details**	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	**General : HTTP:** Overview- HTTP Basics, Client request, Server response; HTTP Headers; Session Management- Persistent Connections, Cookies. General Concepts on web server: Configuration & Administration; virtual hosting General Concepts of catching proxy server, Web security SSL, Digital signatures ; Authentication.	8	16
UNIT-II	2	**Client side technologies HTML:** Structure of HTML. Document- Meta tags, Links, Text, Lists, Tables, Inclusions(Objects, Images, applets and multimedia Contents); Presentation of HTML document- Style sheets, Alignment, fonts, frames; Interactive HTML document- Forms, Scripts XML: Well-Formed Valid document, Document Type Definitions and Document Object Model Client Side JavaScript: Object Reference- Objects Methods and Properties, Event Handlers; Language Constructs – Statements and Operators.	10	20
UNIT-III	3	**PERL & CGI :** CGI architecture Intro PERL with features, Working with strings, and arrays, file handling, pattern matching, & formatting, Creating and using subroutines, Using PERL for CGI scripting . Java Servlets & Java Active Server pages: Overview, Request, Response, Applications, Sessions, Cookies, Data Store Access, Web Applications. SSI : SSI Directives; SSI Environment Variables; SSI Formats **ASP Introduction:.** ASP Install, ASP syntax, ASP variables ASP procedures, ASP forms, ASP Cookies, ASP Session, ASP Application, ASP Server, ASP Error, ASP File System, ASP Text Stream, ASP Drive, ASP File, ASP Folder, ASP Dictionary	12	24
UNIT-IV	4	Apache Tomcat Server Obtaining and Installing Apache Tomcat, Tomcat Directory Structure- bin, conf, logs, server, work, temp, webapps, Web Application Directory Structure, Deploying HTML and JSP Pages, Configuring tomcat- Editing server.xml, Deploying Web Applications- Deployment Descriptors, Web.xml configuration file Tomcat manager- Deploying and Managing Web Application using the tomcat Manager, Creating a WAR File. Configuring Tomcat to Connect to a Database	10	20

		Configuring Security on Tomcat, Granting Permissions to Java Apps.		
Total			50	100

References:

1. Beginning Web Programming with HTML , XHTML, CSS & JavaScript by Jon Duckett Wrox
2. Webmaster in a Nutshell by Stephen Spainhour, O'Reilly and Associates.
3. JavaScript : The Definitive Guide by David Flanagan, O'Reilly and Associates.
4. Beginning ASP 3.0 by David Buser and Others, Wrox.

Branch: BCA	**Semester-VI**
Subject Code: 6201	**Practical: 04** **Credit: 04**
Subject Title	**Elective-3 Web Technology**

1.

Modules	Sr.No.	**Topic and Details**	No. of Lectures /Practicals Assigned	Marks Weightage %
Unit-I	1.	Problem Definition	5	8
Unit-II	2	Analysis	5	8
Unit-III	3.	Design	5	8
	4.	Coding	25	10
Unit-IV	5.	Testing	5	10
	6,	Demonstration & Project Report	5	6
Total			50	100

Prepare and submit a progress report in stipulated time. Panel consisting of two/three teachers (internal) should evaluate the progress work, presentation, and project coding and implantation work. There shall be one guide from institution. Co-guide from an industry is recommended in case of industry sponsored projects. Each candidate should have documented copy of the project certified by head/principal, in order to appear for project examination. A group recommended of 2 to 4 students. (maximum 5 in case of special projects). Each student shall individually involve in separate module/activity of the project. Prepare and submit a progress report in stipulated time.Panel consisting of two experts (one internal and one external) should evaluate the progress, presentation, and project work. Marks should be distributed on the basis of Understanding the project, depth of knowledge achieved in regard to solution providing, Approach and

methodologies suggested towards solution, report writing, presentation, technical content, prototype implemented, and references used, etc. The time allotted for presentation is maximum 30 minutes. The candidate will be examined by the examiners on 50:50 basis. In case of dispute, decision by external will be final.