Study & Evaluation Scheme

of

Bachelor of Computer Applications
(BCA)
[Applicable for the Batch 2013-14 till revised]

[With revision approved by AC/EC meeting date September 21, 2013]

TEERTHANKER MAHAVEER UNIVERSITY

Delhi Road, Moradabad, Uttar Pradesh-244001

Website: www.tmu.ac.in

TEERTHANKER MAHAVEER UNIVERSITY

(Established under Govt. of U. P. Act No. 30, 2008)
Delhi Road, Moradabad (U.P)

Study & Evaluation Scheme
of
Bachelor of Computer Applications

SUMMARY

Programme : Bachelor of Computer Applications
Duration : Three year full time (Six semesters)
Medium : English
Minimum Required Attendance : 75 %
Maximum Credits : 162
Minimum credits required for the degree : 157

Assessment :

Internal	External	Total
30	70	100

Internal Evaluation (Theory Papers)

Class Test I	Class Test II	Class Test III	Assignment(s)	Other Activity (including attendance	Total
Best two out of the three					
10	10	10	5	5	30

Evaluation of Practical/Dissertations & Project Reports :

Internal	External	Total
50	50	100

Duration of Examination :

External	Internal
3 hrs.	1 ½ hr

To qualify the course a candidate is required to secure a minimum of 40% marks in aggregate including the semester end examination and teachers continuous examination (i.e., both internal and external).

A candidate who secures less than 40% of marks in a course shall be deemed to have failed in that course. The student should have secured at least 50% marks in aggregate to clear the semester. In case a student has secured more than 40% in each course but less than 50% overall in a semester, he/ shall reappear in courses where the marks are less than 50% to achieve the required aggregate percentage (50%) in the semester.
There shall be three class tests in a semester and the marks of the best two will be considered for the final result.

Question paper structure

1. *The question paper shall consist of eight questions out of which first question shall be of short answer type not exceeding 50 words and will be compulsory. Question no. 1 shall contain 8 parts representing all units of the syllabus and students shall have to answer any five having weightage of 4 marks each.*
2. *Out of the rest seven questions, students shall be required to attempt any five questions. There will be minimum one and maximum two questions from each unit of the syllabus. The weightage of question no. 2 to 8 shall be of 10 marks each.*

Internal Evaluation (50 marks)
Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point scale which would include the sheet drawn by the students and a Viva voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (30 MARKS)			ATTENDANCE (5 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (10 MARKS)	FILE WORK (10 MARKS)	VIVA (10 MARKS)				

External Evaluation (50 marks)
The external evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

EXPERIMENT (20 MARKS)	FILE WORK (10 MARKS)	VIVA (20 MARKS)	TOTAL EXTERNAL (50 MARKS)

Comprehensive Viva/ Seminars:
Comprehensive Viva Voce/ Seminars will be conducted by a Board of Examiners comprising the Principal/Dean and one external expert and the faculty guide or a faculty nominated by the Principal.

Study & Evaluation Scheme
Programme: Bachelor of Computer Applications

Semester – I

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BCA101	Mathematics –I	4	2	-	5	30	70	100
2	BCA106	Foundation English I	3	2	-	4	30	70	100
3	BCA107	Fundamentals of Computer's & MS-Office	4	2	-	5	30	70	100
4	BCA108	Digital Electronics	4	2	-	5	30	70	100
5	BCA109	Management Concept & Organizational Behavior	3	2	-	4	30	70	100
6	BCA151	Ms-Office & Internet Lab	-	-	4	2	50	50	100
7	BCA153	Digital Electronics Lab	-	-	4	2	50	50	100
Total			**18**	**10**	**8**	**27**	**250**	**450**	**700**

Semester - II

S.No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BCA202	Programming In C	4	2	-	5	30	70	100
2	BCA206	Foundation English II	3	2	-	4	30	70	100
3	BCA207	Computer Organization & Architecture	4	2	-	5	30	70	100
4	BCA208	Numerical Methods	4	2	-	5	30	70	100
5	BCA209	Environmental Studies	3	2	-	4	30	70	100
6	BCA251	C Language Lab	-	-	4	2	50	50	100
7	BCA253	Numerical Methods Lab	-	-	4	2	50	50	100
Total			**18**	**10**	**8**	**27**	**250**	**450**	**700**

Semester – III

S.No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BCA302	Data Structure Using C	4	2	-	5	30	70	100
2	BCA305	Professional Writing	3	2	-	4	30	70	100
3	BCA306	Operating System	4	2	-	5	30	70	100
4	BCA307	Fundamentals Of Database Systems	4	2	-	5	30	70	100
5	BCA308	System Analysis And Design	3	2	-	4	30	70	100
6	BCA354	Data Structure Lab Using C	-	-	4	2	50	50	100
7	BCA353	Database Systems Lab	-	-	4	2	50	50	100
Total			**18**	**10**	**8**	**27**	**250**	**450**	**700**

Semester – IV

S.No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BCA402	Software Engineering	4	2	-	5	30	70	100
2	BCA404	Oops & C++	4	2	-	5	30	70	100
3	BCA406	Technical Communication	3	2	-	4	30	70	100
4	BCA407	Computer Graphics	4	2	-	5	30	70	100
5	BCA408	Fundamentals Of Accounting	3	2	-	4	30	70	100
6	BCA452	OOPs & C++ LAB	-	-	4	2	50	50	100
7	BCA453	Computer Graphics Lab	-	-	4	2	50	50	100
Total			**18**	**10**	**8**	**27**	**250**	**450**	**700**

Semester – V

S.No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1.	BCA502	VB.Net	4	2	-	5	30	70	100
2.	BCA503	Computer Networks	4	2	-	5	30	70	100
3.	BCA509	Software Project Management	4	2	-	5	30	70	100
4.	BCA510	Multimedia And Animation	4	2	-	5	30	70	100
5.	BCA551	Mini Project (Industrial Training)	-	-	0	3	50	50	100
6.	BCA552	VB.Net Lab	-	-	4	2	50	50	100
7.	BCA554	Multimedia And Animation Lab	-	-	4	2	50	50	100
Total			**16**	**08**	**8**	**27**	**270**	**430**	**700**

Semester – VI

S.No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1.	BCA605	Web Technologies With PHP	4	2	-	5	30	70	100
2.	BCA606	Computers, Ethics And Society	4	2	-	5	30	70	100
3.	BCA607	Core Java Programming	4	2	-	5	30	70	100
4.	BCA608	Management Information System	4	2	-	5	30	70	100
5.	BCA653	Project Work	-	-	0	3	50	50	100
6.	BCA654	Web Technologies With PHP Lab	-	-	4	2	50	50	100
7.	BCA655	Core Java Programming-Lab	-	-	4	2	50	50	100
Total			**16**	**08**	**8**	**27**	**270**	**430**	**700**

Evaluation Scheme for Short Term Courses

Objective: University allows students to undertake additional subjects/course(s) (In-house offered by the university through collaborative efforts or courses in the open domain by various internationally recognized universities) and to earn additional credits on successful completion of the same. Each program will be approved in advance by the University following the standard procedure of approval and will be granted credits as per the approval.

In case of the students having taken such additional subjects/courses

1. Each course will have its evaluation criteria and credits allocated based on the teaching/practical hours associated with it; after due processing as per university ordinance and approval of the Vice Chancellor. The notification to the same shall happen before the start of the subject/ course.
2. In case a student fails to secure minimum required credits then the additional subject(s) shall be counted for calculating the minimum credits required for the award of degree.
3. If a student has secured minimum required credits then these courses shall be shown as additional subjects in the consolidated mark sheet to be issued by the examination division.

BCA - Semester I
MATHEMATICS- I

Course Code: BCA101/ ICA101 **L-4, T-2, P-0, C-5**

Objective: This paper provides mathematical handling for certain types of problems in matrix, set theory, differential calculus and series.

Course Contents

Unit - I
Definition and types of matrices such as square, row, Column, diagonal, identity, symmetric, singular, non-singular Matrices. Operation of matrices such as addition, subtraction, multiplication of matrices. **(Lecture 08)**

Unit - II
Determinants and Adjoint of a matrix, Inverse of matrix, Solution of simultaneous linear equations by Matrix Method & Cramer's rule. **(Lecture 08)**

Unit - III
Set & subset, Finite and Infinite set, Equal set, Null set, Proper subset, universal set, Singleton set. Union, Intersection, complement of set. Common applications of set. **(Lecture 08)**

Unit - IV
Differentiation of functions, derivatives of some common functions, polynomials, exponential, logarithmic & trigonometric functions. **(Lecture 08)**

Unit - V
Mathematical Series- Arithmetic, Geometric & Harmonic Series.

(Lecture 08)

Text Books:
1. Vasistha A. R., Matrices, Krishna Publications.
2. O P Malhotra, S K gupta,"ICSE Mathematics" S Chand

Reference Books:
1.Seth M.Ray, Elements of Matrix and Determinants
2. Shanti Narayan, Differential Calculus,S.Chand

*Latest editions of all the suggested books are recommended.

BCA - Semester I
FOUNDATION ENGLISH- I

Course code: BCA106 /ICA109 **L-3, T-2, P-0, C-4**

Objective: This syllabus has been designed to improve the oral and written communication skills of students.

Course Contents

Unit - I
Functional Grammar: Patterns & Parts of speech Subject, Predicate, Noun, Pronoun, Adjective, Adverb, Verb, Verb phrases, Conjunction, Interjection. **(Lecture 10)**

Unit - II
Vocabulary: Word formation, Prefix, Suffix, Compound words, Conversion, Synonyms, Antonyms, Homophones and Homonyms, How to look up a dictionary. **(Lecture 10)**

Unit - III
Communication: Meaning & importance of communication, Barriers to effective communication, Channels of communication, Language as a tool of communication.
(Lecture 10)

Unit - IV
Expression: Speaking Skill- Prepared speech on set topic ,Extempore speech. Reading skill- Comprehension Test. Préci Writing. **(Lecture 10)**

Text Books:
1. Monippally , Matthukutty - Business Communication: From Principles To Practice-Tata Mc Graw Hill Education,2013.
2. Hewings, Martin - Advanced Grammar-Cambridge University Press, 2012.

Reference Books:
1. Raman Meenakshi & Sharma Sangeeta, Technical Communication-Principles & Practice – O.U.P. New Delhi. 2007.
2. Living English Structure, William Stannard Allen, Longman Publisher
3. English Errors of Indian Students, Oxford University Press, New Delhi.
4. Advanced Learner's Dictionary, O.U.P

* Latest editions of all the suggested books are recommended

BCA - Semester I
FUNDAMENTALS OF COMPUTER'S AND MS-OFFICE

Course Code: BCA107/ICA106 **L-4, T-2, P-0, C-5**

Objective: To give the basic knowledge of Computer hardware and application software to the students.

Course Contents

Unit-I

Computer Basics: Introduction and definition of computer, Computer Generations, Characteristics of Computer, Advantages and Limitations of computer, Classification of computers, Functional components of a computer system (Input, CPU, Storage and Output Unit), Types of memory (Primary and Secondary), Computer Hardware: Input Devices- Mouse, Bar Code Reader, Keyboard, Scanner, Joystick, Output Devices-VDU, Printer, Plotters, Types of Computer Software. **(Lecture 08)**

Unit-II

Computer Languages: Introduction to languages, Compiler, Interpreter and Assembler, High Level Language to Machine Language Conversion , Evolution of programming language, Classification of Programming Languages, Features of a good Programming Language, Example of High Level Languages, Characteristics of a good language Number system: Binary number system, Octal & Hexa-decimal number system. **(Lecture 08)**

Unit-III

Algorithm, flowcharts: flowcharts symbols, sample flowcharts.

MS-DOS: Operating System, Basic Concepts of Operating System, Introduction of MS-DOS, Internal Commands-VOL,VER, DATE, TIME, CLS, DIR, CD, MD, PROMPT, TYPE, COPY, COPY CON , External Commands-MOVE, MORE, FIND, ATTRIB, TREE, DELTREE, EDIT, FORMAT

MS-WORD: Starting MS WORD, Creating and formatting a document, Changing fonts and point size, Table Creation and operations, Autocorrect, Auto text, spell Check, Word Art, Inserting objects, Page setup, Page Preview, Printing a document, Macros, Mail Merge

(Lecture 08)

Unit-IV

MS-EXCEL: Starting Excel, Work sheet, cell inserting Data into Rows/ Columns, Alignment, Text wrapping , Sorting data, Auto Sum, Use of functions, Cell Referencing form, Generating graphs, Worksheet data and charts with WORD, Creating Hyperlink to a WORD document, Page set up, Print Preview, Printing Worksheets.

MS-ACCESS: Maintaining Database by creating Tables, Queries, Reports and Forms

(Lecture 08)

Unit-V

MS-POWERPOINT: Starting MS–Power Point,, Creating a presentation using auto content Wizard, Blank Presentation, creating, saving and printing a presentation, Adding a slide to presentation, Navigating through a presentation, slide sorter, slide show, editing slides, Using

Clipart, Word art gallery, Adding Transition and Animation effects, setting timings for slide show, preparing note pages, preparing audience handouts, printing presentation documents
Introduction of Internet: Web Browsers, Searching, Surfing, Creating E-Mail account, sending and receiving E-Mails **(Lecture 08)**

Text Books:

1. Sinha P.K., Computer Fundamentals, BPB Publishing.
2. O'Leary Timothy, O'Leary Linda , Microsoft Office 2007,TMH Publication
3. Kanitkar Yashwant, Let Us C, BPB Publishing.

Reference Books:

1. Leon A. & Leon M., Introductions to Computers, Vikas Publication.
2. Balagurusamy E., Programming in ANSI C, TMH Publication.
3. Norton Peter, Introductions to Computers, TMH Publication.
4. Price Michael, Office 2010 in Easy Steps ,TMH Publication.

*Latest editions of all the suggested books are recommended.

BCA - Semester I
DIGITAL ELECTRONICS

Course Code: BCA108/ICA107 **L-4, T-2, P-0,C-5**

Objective: This subject provides students an in–depth theoretical base of the Digital Electronics, the fundamental designing concepts of different types of Logic Gates, Minimization techniques and the computational details for Digital Circuits.

Course Contents

Unit - I
Number systems : Binary number system, Octal & Hexa-decimal number system, Conversion of Number System, r's & (r-1)'s, Binary arithmetic Operations, complement weighted & unweighted codes (BCD,Excess-3,Gray code). **(Lecture 08)**

Unit - II
Logic Gates: AND, OR, NOT GATES and their Truth tables, NOR, NAND & XOR gates.
Boolean algebra: AND, OR, Inversion, Basic Boolean Law's, Demorgan's theorem, Minimization techniques: K -Map, Sum of Product & Product of Sum. **(Lecture 08)**

Unit III
Sequential Circuits: Flip Flop, Types of Flip Flop: R-S, D, J-K, T, Master Slave, and State Realization of one Flip Flop Using Other Flip Flop. **(Lecture 08)**

Unit IV
Combinational circuits: Multiplexers, Demultiplexers, Decoders & Encoders, Half Adder, Full Adder, Half Subtractor, Full Subtractor. **(Lecture 08)**

Unit V
Registers and Counters: Shift Registers, Types of registers, Universal Shift Register with parallel load, Bi-directional Shift register. **(Lecture 08)**

Text Book:
1. Morris Mano, *Digital Logic*, Prentice Hall of India.

Reference Books:
1. Taub & Schelling, *Digital Integrated Electronics*, McGraw-Hill International Edition
2. Charles H.Roth, Jr. *Fundamentals of Logic Design*, Jaico Publishing House, 2000.
3. Donald D.Givone, *Digital Principles and Design*, Tata McGraw-Hill, 2003.
4. Bartee, *Digital Computer Fundamentals.*

*Latest editions of all the suggested books are recommended.

BCA- Semester I
MANAGEMENT CONCEPT & ORGANIZATIONAL BEHAVIOR

Course Code: BCA109/ICA108 **L-3, T-2, P-0, C-4**

Objective:
The objectives of this subject are to enable

- to describe the nature and scope of management;
- to know the difference between management and administration;
- to understand the concepts of organizational behavior and its application in managing people

Course Contents

Unit I
Introduction to Management: Meaning, nature and importance of management; Management functions; Management skills; Classical theories of management. **(Lecture 08)**

Unit II
Planning: Importance of planning; Types of plans; Planning and decision making process. Process of organizing; Organizational structure and design. **(Lecture 08)**

Unit III
Organizational Behavior: introduction to organizational behavior in management; Foundations of individual behavior-personality; Concept of perception & perception theories **(Lecture 08)**

Unit IV
Concept of learning with theories, Concept of attitudes, Job design & job satisfaction. Concept of motivation with theories. **(Lecture 08)**

Unit V
Group: Foundations of group behavior; Leadership: power and politics. Organizational culture: Meaning, importance and characteristics of organization culture. **(Lecture 08)**

Text Books:

1. Newstrom, John W. and Keith Davis, Organizational behavior: Human Behavior at Work, Tata McGraw-Hill, New Delhi, 1997.
2. Sharma, R.A., Organizational Theory and Behavior, Tata McGraw -Hill, New Delhi.
3. Prasad L.M., Principles and Practice of Management, Sultan Chand
4. Murugan and Shaktivel, Management Principles and Practices, New Age

Reference Books:

1. Koontz, Harold, Cyril 'O' Donnell, And Heinz Weihrich, Essentials of Management, Fourth Edition, McGraw-Hill, Singapore.

2. Robbins, Stephen P. and Mary Coutler, Management, 5th ed., Prentice Hall of India Private Ltd., New Delhi.
3. Rendolph, Bobbitt, H., Organizational Behavior, 7th ed., Prentice Hall, New Jersey.
4. Srivastava &Chunawalla, Management Principles and Practices,Macmillan
5. Koontz, Principles of Management, Tata McGraw Hill, 2008

*Latest editions of all the suggested books are recommended.

BCA - Semester I
MS-OFFICE & INTERNET LAB

Course Code: BCA151/ICA153 **L-0, T-0, P-4, C-2**

Course Contents

Introduction to Windows: Windows features including Control Panel and it's Components, Graphical features, Desktop setting with screensaver and wallpaper, Color, Background, Cut, Copy, Paste, Creating folder.

MS-WORD

Creating, Editing, Formatting: Font name, size, color, alignment, changing paragraph settings, Using Word Art ,Hyperlink, change case, spell checker, Mail Marge, Creating Tables, editing tables, alignment settings in tables

MS-EXCEL

Creating, Editing, Formatting: Font name, size, color, alignment, entering data, sorting data, Inserting, renaming and deleting Sheet, Inserting row, column, cell, picture, background, graph, symbol, applying formula in a cell, Call by Value, Call by Reference, hyperlink, object, diagram, Macro.

MS-POWERPOINT

Creating, Editing, Formatting: Font name, size, color, alignment, changing, Inserting table, picture, background, graph, symbol, hyperlink, object, and diagram, Slide Layout, Slide Design, Slide Show, Slide Sorter View, Slide Transition, Custom Animation, Inserting Sound and Movies in a Slide.

MS-ACCESS

Creating and editing Database using Table, Query, Report and Form.

Introduction to Internet

Web Browser, Search Engine, Creating E-Mail account, Attaching documents, Sending and Receiving E-Mails

BCA - Semester I
DIGITAL ELECTRONICS LAB

Course Code: BCA153/ICA154 **L-0, T-0, P-4, C-2**

Course Contents

1) To study AND gate.
2) To study OR gate.
3) To study NOT gate.
4) To study NOR gate.
5) TO study NAND gate.
6) To study XOR gate.
7) To study NAND using AND and NOT.
8) To study NOR using OR and NOT.
9) Give truth table of AB+C'.and verify it.
10) Give truth table of A'B+C' and verify it.
11) To study XOR usingAND , OR and NOT.
12) To study XOR using NAND Gates.
13) To study XNOR gate.
14) To study XNOR using AND,OR,NOT gates.
15) To study XNOR using NOR gates.
16) To study XNOR using NAND gates.
17) To study NOR using NAND.
18) To study AND using NAND.
19) To study OR using NAND.
20) To study OR using NOR.
21) To study AND using NOR.
22) To study NAND using NOR.
23) To study XOR using NOR.
24) To study NOT using NAND.
25) To study NOT using NOR.
26) Give truth table of (A'B')'+C.and verify it.
27) Give truth table of (A+AB')C'.and verify it.
28) Give truth table of AB+BC'.and verify it.
29) Give truth table of (AB)'+C'.and verify it.
30) Give truth table of (A'BC+BC') and verify it.
31) To study Half Adder.
32) To study Full Adder.
33) To study HalfSubtractor.
34) To study Full Subtractor.
35) To study RS flip-flop using NOR gate.
36) To study D-type flip-flop using NAND gate.
37) To study JK flip flop using NOR gate.
38) To study T flip flop using NAND gate.
39) To study the 2 to 4 decoder.
40) To study decoder of Binary to Decimal.

BCA - Semester II
PROGRAMMING IN 'C'

Course Code: BCA202/ICA202 **L-4, T-2, P-0, C-5**

Objective: The objective of this course module is to provide the sound knowledge of C programming. It facilitates the student to develop programming capability to design programs as well as real life applications using C language. It also cover the concept of core programming like how to implement functions ,arrays and how to manage data in files using different operations.

Course Contents

Unit - I

Concept of C programming: History, Introduction of C programming language, Structure of C program, C character set, Data types, Variables, Constants, Keywords and Identifiers, Expression statements in C language, Operators (Arithmetic, Logical, Relational, Assignment etc.).

(Lecture 08)

Unit - II

Conditional Program: Execution, IF statement, IF…..ELSE statements nested IF…..ELSE and ELSE IF ladder. Program Loops and Iteration, WHILE loop, DO loop and FOR loop, Nested Loops, Use of break, continue and GOTO statements, Switch statement, use of break and default with switch, Storage Class in C language. **(Lecture 08)**

Unit - III

Functions: Built-In and User Defined functions, Function Declaration, Definition and Function Calling, Parameter Passing (Call by Value and Call by Reference), Recursion, Pointers, Macros.

(Lecture 08)

Unit - IV

Arrays: Definition of array, declaration, Linear Arrays, Multidimensional Arrays, Passing Array to function, String, string handling functions, Dynamic Memory Allocation. **(Lecture 08)**

Unit - V

Structure and Union: Definition, Programs using Structure and Union, Difference between Structure and Union.

File Handling: Opening and Closing data files, Read and Write Functions, different modes of files. **(Lecture 08)**

Text Books:

1. BalaguruswamyE., *Programming in ANSI C,* TMH
2. Kanitkar Yashwant, *Let Us C*, BPB
3. Kanitkar Yashwant, *Working With C*, BPB

References Books:

1. Brian W. Kernighan and Dennis M. Ritchi, PHI
2. Shaum's Series *Programming in C,* TMH
3. Forouzan, *Computer Science*, Thomson, Cengase

*Latest editions of all the suggested books are recommended.

BCA - Semester II
FOUNDATION ENGLISH II

Course code: BCA206/ICA209 **L-3, T-2, P-0, C-4**

Objective: The objective of the syllabus is to prepare students on advance English grammar skills to make them write correct English.

Course Contents:

Unit - I
Functional Grammar: Articles, Preposition, Tenses: Functions, Synthesis, Transformation, Spotting errors and correction of sentences. **(Lecture 10)**

Unit - II
Pre- Requisites of Technical written Communication: One word substitution, Spelling rules, Words often confused & misused, Phrases. **(Lecture 10)**

Unit - III
The Structure of sentences/ clauses: Adverb clause, Adjective clause, Noun clause. Sentences: Simple, Double, Multiple and complex, Transformation of sentences: simple to complex & vice versa, simple to compound & vice-versa, Interrogative to assertive, assertive to negative & vice-versa. **(Lecture 10)**

Unit - IV
Technical Communication: Nature, Origin and Development, Salient features, Scope & Significance, Forms of Technical Communication, Difference between Technical communication & General writing, Objective Style vs. Literary Composition. (**Lecture 10)**

Text-Books:

1. Murphy, Raymond- English Grammar- Cambridge University Press, 2012
2. Raman Meenakshi & Sharma Sangeeta, Technical Communication-Principles & Practice O.U.P. New Delhi. 2007.
3. Mitra Barum K., Effective Technical Communication – O.U.P. New Delhi. 2006.
4. Better Your English- A Workbook for 1st year Students- Macmillan India, New Delhi.

Reference Books:

1. Horn A.S., Guide to Patterns & Usage in English – O.U.P. New Delhi.
2. Mohan Krishna & Banerji Meera, Developing Communication Skills – Macmillan India Ltd., Delhi.

* Latest editions of all the suggested books are recommended.

BCA - Semester II
COMPUTER ORGANIZATION AND ARCHITECTURE

Course Code: BCA207/ICA206 **L-4, T-2, P-0, C-5**

Objective:

- To have a thorough understanding of the basic structure and operation of a digital computer.
- To discuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division.
- To study the different ways of communicating with I/O devices and standard I/O interfaces.
- To study the hierarchical memory system including cache memories and virtual memory

Course Contents

Unit - I

Basic Building Blocks: Half Adder, Full Adder, Half Subtractor, Full Subtractor, Decoder, Encoders, Multiplexer, Demultiplexer, Registers, Registers with parallel load **(Lecture 08)**

Unit - II

Register Transfer Language: Bus and Memory Transfer, Three State Bus Buffers, Memory Transfer, Arithmetic Micro operation(Binary Adder, Binary Adder-Subtractor, Binary Increment, Arithmetic Circuit), Logic Micro operations(List of logic operation), Shift Micro operations, Arithmetic Logic Shift Unit. **(Lecture 08)**

Unit - III

Processor Organization: General register organization, Stack organization, Reverse Polish Notation, addressing mode, Instruction type. . **(Lecture 08)**

Unit - IV

Input-Output Organization: I/O Interface, I/O bus and interface modules, Strobe control, Hand Shaking, DMA, Interrupts & Interrupt handling, Direct Memory access: DMA Controller and DMA Transfer. **(Lecture 08)**

Unit - V

Memory Organization: Memory Hierarchy, Main Memory: RAM & ROM chips, Memory Address Map, Cache memory, Virtual Memory, page replacement schemes. **(Lecture 08)**

Text Books:

1. Mano M., *Computer System Architecture*, Prentice Hall of India.
2. SubrataGhoshal, *Computer Architecture and Organization*, PEARSON

Reference Books:

1. Vravice, Zaky&Hamacher, *Computer Organization*, Tata McGraw Hill
2. Tannenbaum,*Structured Computer Organization*, Prentice Hall of India.
3. Hayes John P., *Computer Organization*, McGraw Hill.

*Latest editions of all the suggested books are recommended.

BCA - Semester II
NUMERICAL METHODS

Course Code: BCA208/ICA207 **L-4, T-2, P-0, C-5**

Objective: Numerical Analysis is the study of algorithms for solving problems of continuous mathematics. This paper provides an introduction to finite differences, interpolation, numerical differentiation and integration, differential and linear equation.

Course Contents

Unit - I
Finite Differences: Types of operators and relations among operators, forward and backward difference table, Computation of Missing terms, Factorial Notations and reciprocal factorial. Polynomial in factorial notions **(Lecture 08)**

Unit - II
Solution of System of Linear Equation: Gauss Elimination method, Gauss Jordan method, Gauss Seidel method, Gauss Jacobi method. **(Lecture 08)**

Unit - III
Interpolation: Newton's forward and backward interpolation formula. Interpolation with unequal Intervals- Lagrange's interpolation formula, Inverse Interpolation, Lagrange's method for inverse Interpolation.
Divided Difference: Divided difference table and properties, Newton Divided difference formula. **(Lecture 08)**

Unit - IV
Numerical Differentiation: Numerical Differentiation by Newton's forward and backward interpolation formula.
Numerical Integration: Trapezodial rule, Simpson 1/3 Rule, Simpson's 3/8**.**
(Lecture 08)

Unit - V
Solution of Differential Equation: Picard's Method, Euler's Method, Runge- Kutta Method and Predictor- Corrector Method. **(Lecture 08)**

Text Books
1. Grewal B. S., "Numerical methods in Engineering and Science", Khanna Publishers, Delhi
2. Pradip Niyogi, "Numerical Analysis and Algorithms", TMH

References
1. Grewal Rajaraman V., "Computer Oriented Numerical Methods", PHI
2. T. Veerarajan, T Ramachandran, "Theory and Problems in Numerical Methods", TMH
3. Francis Scheld, "Numerical Analysis", TMH
4. Manoj Kumar, "Computer based Numerical & Statistical Techniques", Krishna Prakashan.

*Latest editions of all the suggested books are recommended.

BCA - Semester II
ENVIRONMENTAL STUDIES

Course Code: BCA209/ICA208 **L-3, T-2, P-0, C-4**

Objective:
The objectives of this subject are

- To locate and comprehend relationships between the natural, social and cultural environment;
- To develop an understanding based on observation and illustration, drawn from lived experiences;
- To develop an awareness about environmental issues.

Course Contents

Unit - I
The Multidisciplinary nature of environmental studies: Definition, Nature, Scope and Importance; Types and components of environment; goals of environmental education; Global environmental crisis. **(Lecture 08)**

Unit - II
Natural resources: Renewable and non-renewable resources Nature and Natural resources their conservation and associated problems. Energy resources: Renewable and Nonrenewable energy sources, use of alternate energy sources, Energy conservation **(Lecture 08)**

Unit - III
Ecology and Ecosystems: Concept of ecology, autecology and synecology, population ecology, community ecology Concept of an ecosystem; different types of ecosystem, Producers, consumers and decomposers • Energy flow in the ecosystem, energy flow models • Food chains, food webs and ecological pyramids biogeochemical cycles: Pattern and basic types of biogeochemical cycles (Nitrogen, Phosphorus) **(Lecture 08)**

Unit - IV
Environmental Pollution: Definition, Sources, Causes, effects and control measures of: - Air pollution, Water pollution, and Soil pollution Noise pollution.
Solid waste management: causes, effects and control measures of biomedical wastes and municipal solid wastes. **(Lecture 08)**

Unit - V
Environmental Pollution: Social Issues and the Environment • Water conservation, rain water harvesting, • Climate change, global warming, acid rain, ozone layer depletion,
• Environment Protection Movements in India – Chipko movements, Silent Valley movements, Public awareness
Human Population and the Environment: Definition, characteristics; human Population growth, concept of carrying capacity, Population explosion – Family Welfare Program.
(Lecture 08)

Text Books:

1. Dr. D.L. Manjunath, Environmental Studies, Pearson Education, 2006
2. Joseph Benny, Environmental Studies, Tata McGraw Hill, 2005
3. Bharucha Erach, the Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad
4. R. Rajagopalan, Environmental Studies, Oxford Publication, 2005

Reference Books:

1. Textbook of Environment & Ecology, Deeksha Dave and S.S. Katewa, Cengage Learning India Pvt. Ltd.,Patparganj, Delhi, 2009
2. Environmental Science & Engineering, Meenakshi, Prentice Hall India
3. Principles of Environmental Science, Cunningham W.P. & Cunningham M.A., Tata McGraw Hill Publishing Co. Ltd., New Delhi

*Latest editions of all the suggested books are recommended.

BCA - Semester II
C LANGUAGE LAB

Course Code: BCA251/ICA253 **L-0, T-0, P-4, C-2**

Course Contents

1. Given the values of the variables x, y and z, write a program to rotate their values such that x has the value of y, y has the value of z, and z has the value of x

2. Write a program that reads a floating point number and then displays the right-most digit of the integral part of the number.

3. The distance between two cities (in Km) is input through the keyboard. Write a C program to convert and print this distance in meter, feet, inches and centimeter.

4. If a five-digit number is input through the keyboard, write a C program to calculate the sum of its digits without using loop.

5. If a four-digit number is input through the keyboard, write a C program to obtain the sum of the first and last digit of this number.

6. Program to find largest and smallest number from four given number.

7. Program to find whether a year is leap or not.

8. Program to find out the grade of a student when the marks of 5 subjects are given. The method of assigning grade is as—

Per >= 85	Division=First	grade=A+
Per< 85 and Per>= 70	Division=First	grade=A
Per< 70 and Per>= 60	Division=Firs	grade=B+
Per< 60 and Per>= 50	Division=Second	grade=B
Per< 50 and Per>= 40	Division=Third	grade=C
Per < 40	Division=Fail	grade= Fail

9. A library charges a fine for every book returned late. For first 5 days the fine is 50 paise, for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. Write a program to access the number of days the member is late to return the book and display the fine or the appropriate message.

10. Write a C program in which enter any number by the user and perform the operation of product of digits of entered number.

11.Write a C program in which enter any number by the user and perform the operation of Sum of digits of entered number.

12. Write a C Program to convert Decimal number to Binary number.

13. Find the sum of this series upto n terms
1+2+4+7+11+16+……..

14.Program to print Armstrong's numbers from 1 to 10000.

15.Program to find the sum of digits of a number until the sum is reduced to 1 digit.
For example: 538769 38 11 2

16.Write a program to convert years into

1. Minute
2. Hours
3. Days
4. Months
5. Seconds

Using switch () statements.

17.Write a C menu driven program that will perform the following operation.

1) Generate Fibonacci series as per given range which is entered by the user.

2) Print all the prime number between 1 to 300.

3) Exit

18.Write a C Program that will perform the logic of Perfect number.

19.Write a program to generate the following pattern –
(i).

```
A   B   C   D   C   B   A
A   B   C       C   B   A
A   B                   B   A
A                           A
```

(ii).

```
        1
      1   1
    1   2   1
  1   3   3   1
1   4   6   4   1
1  5  10  10  5  1
```

20. Write a currency program, which tells you how much numbers of 100, 50,20,10,5,2 and 1 Rs notes will be needed for a given amount of money. For example if the total amount is Rs. 545 then five 100 Rs. notes, two 20 Rs. Notes and one 5 Rs. Note will be needed.

Programs related to function:

1. Write a C program to perform the factorial of given number.

2. Write a C program that input numbers and display one of the following as per the desire of the user:

(a) Sum of the numbers

(b) Difference of the numbers

(c) Product of the numbers

(d) Division of the numbers

(e) Exit

Provide separate functions for performing various tasks as Calculating.

3. Write a C program to find the sum of the following series using function.

X – X3/3! + X5/5! – X7/7! …….

4. Write a C program in which a function prime that returns 1 if its argument is a prime and return zero otherwise.

5. Write a C program to perform the operation of nPrand operation of nCrusing separate function.

6. A positive integer is entered through the keyboard. Write a function to obtain the prime factors of this number.

7. Write a C program using function that find out the 4th bit of given number is on or off.

Program related to Recursion:

1. Write a C program to calculate factorial of a number using recursion. Number being entered by user.

2. Write a C program to generate Fibonacci series using recursion. The user enters the limit of series.

3.Write a C Program to print the reverse of an integer number entered by user

Program related to Array:

1. Write a C program to count the number of positive, negative and zero number in the given list of numbers.

2. Write a C program for swapping of two arrays as per indexes accordingly both array have the same size.

3. Write a C program in which enter 10 elements by the user and perform the operation of sorting in ascending order.

4. WAP to enter an integer array of size 10 and perform following operations on it.
   a) Display the Elements.
   b) Calculate the Sum and Average of Array.
   c) Find largest element.
   d) Find second largest element.
   e) Find the Smallest element.
   f) Display the Array in Reverse order.
   g) Exit

5. Write a C program to perform following operation on it.
   a. Generate n * n Matrix.
   b. Display n * n Matrix.
   c. Perform operation of Addition in two n * n Matrix.
   d. Perform operation of Subtraction in two n * n Matrix.
   e. Perform operation of Multiplication in two n * n Matrix.
   f. Exit

   Form perform every option generate a separate function.

2. Write a C program to perform following operation on it.

1. Generate n * n Matrix.
2. Display n * n Matrix.
3. Perform operation of transpose of an n * n Matrix.
4. Perform operation of sum of diagonal element of an n * n Matrix.
5. Exit

Form perform every option generate a separate function.

3. Write a program to search a given element in an Array using function if the element found then returns its position.

Programs related to String and Pointer:

1. Write a program to read a name through the keyboard. Determine the length of the string and find its equivalent ASCII codes.

2. Write a program to remove the Occurrences of “The” word from entered text.

3. Write a program to delete all the occurrences of the vowels in a given text. Assume that the text length will be of one line.

4.Write a program to copy the content of one string into another string using pointer and function.

5.Write a program to find that two strings are identical or not using pointer and function.

Programs related to Structure and Union:

1. Suppose you need to generate a result table which consists of student id, student name, marks of three subject and total marks. Write a program which takes input for ten students and displays result table. Also display student information separately who got the highest total. USE STUCTURES.

2. Suppose you need to store information of 10 persons. Information includes name and age. But criteria is: for the child age should be in form of full birth date, for an adult the age should be in years only, while for aged person store age indicating the status 'O'. Use union for memory efficiency.

3. Write a program to maintain the library record for 100 books with book name, author's name, and edition, year of publishing and price of the book.

BCA - Semester II
NUMERICAL METHODS LAB

Course Code: BCA253/ICA254 **L-0, T-0, P-4, C-2**

Course Contents

1. WAP to construct difference table in finite difference.
2. WAP of Matrix addition
3. WAP of Matrix Multiplication
4. WAP of Newton's forward interpolation formulae.
5. WAP of Newton's backward interpolation formulae
6. WAP of Lagrange's interpolation formula.
7. WAP of Trapezoidal rule.
8. WAP of Simpson's 1/3 rule.
9. WAP of l Simpson's 3/8 rule.
10. WAP of Picard method.

BCA - Semester III
DATA STRUCTURE USING 'C'

Course Code: BCA302/ICA302 **L-4, T-2 P-0, C-5**

Objective: To give an overview about how the data organizes and the techniques to organize the data. Develop good understanding of how operations are performed on data in various data structures including hierarchical representation. To develop a base for advanced computer science study.

Course Contents

Unit-I

Introduction: Basic Terminology, Elementary Data Organization, Data Structure operations, Algorithm, Complexity and Time-Space trade-off.

Arrays: Array Definition, Representation and analysis, Single and Multidimensional Arrays, address calculation, application of arrays, Character String in C, Character string operation.

(Lecture 08)

Unit-II

Stacks: Array Representation and Implementation of stack, Operations on Stack: Push & Pop, Linked Representation of Stack, Operations Associated with Stack, Application of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using Stack.

Queues: Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Circular queue.

(Lecture 08)

Unit-III

Linked list: Representation and Implementation of Singly Linked List, Traversing and Searching of linked List, Overflow and Underflow, Insertion and deletion to/from Linked List, Insertion and deletion algorithms, Doubly linked list, Circular List, Linked List v/s Array.

(Lecture 08)

Unit-IV

Sorting: Bubble Sort, Selection Sort, Insertion Sort, Quick Sort, Merge Sort, and Heap Sort. Comparative Analysis of above Sorting algorithms. **Searching:** Sequential search, Binary search.

(Lecture 08)

Unit-V

Trees: Basic terminology, Binary Trees, Binary tree representation, algebraic Expressions, Complete Binary Tree, Array and Linked Representation of Binary trees, Traversing Binary tree, Binary Search Tree. **Graph:** Basic terminology, Graph representation using adjacency matrix, Graph representation using adjacency list.

(Lecture 08)

Text Books:

1. Lipschutz, *Data Structure*, Tata McGraw Hill
2. Tenenbaum et. al A.M., *Data Structures Using C & C++*, Prentice Hall of India.
3. KanitkarYashwant, *Data Structure Using C*, BPB
4. Salaria R.S., *Data Structure Using C*, Khanna Publishers

Reference Books:

1. Horowitz and Sahani, *Fundamentals of Data Structures*, Galgotia
2. Kruse et.al R., *Data Structures and Program Design in C*, Pearson Education
3. Cormen T. H., *Introduction to Algorithms*, Prentice Hall of India.
4. Loudon K., *Mastering Algorithms with C*, Shroff Publisher & Distributors
5. Bruno R Preiss, *Data Structures and Algorithms with Object Oriented Design Pattern in C++*, John Wiley & Sons Inc.
6. Adam Drozdek, *Data Structures and Algorithms in C++*, Thomson Asia

* Latest editions of all the suggested books are recommended.

BCA - Semester III
PROFESSIONAL WRINTING

Course code: BCA 305/ICA308 **L-3, T-2, P-0, C-4**

Objective: To give the students exposure about English Grammar and improve their writing skills.

Course Contents

Unit - I
Functional Grammar: Active and passive voice, Conditional sentences, Syntax, Concord, Common errors. **(Lecture 10)**

Unit - II
Requisites of Paragraph writing: Structure of Paragraph, Coherence & Unity, Development of paragraph, Inductive order, Deductive order, Spatial order, Linear, Chronological orders, Expository writing, and Argumentative writing, Factual description of objects, process, experiments. **(Lecture 10)**

Unit - III
Theme writing & presentation, Factual description, Article writing **(Lecture 10)**

Unit - IV
Comprehension skills: Role of listening, Reading comprehension; Reasons for poor comprehension, Improving comprehension skills. **(Lecture 10)**

Text Books:

1. Ruther Ford A., Basic Communication Skills – Pearson Education, New Delhi.

References Books:

1. Raman Meenakshi & Sharma Sangeeta, Technical Communication-Principles & Practice – O.U.P. New Delhi. 2007.
2. Mohan Krishna & Banerji Meera, Developing Communication Skills – Macmillan India Ltd. Delhi.

* Latest editions of all the suggested books are recommended.

BCA - Semester III
OPERATING SYSTEM

Course Code: BCA306/ICA303 **L-4, T-2, P-0, C-5**

Objective: This course has theory component to teach you the concepts and principles that underlie modern operating systems. In this component, you will learn about processes and processor management, concurrency and synchronization, memory management schemes, file system and secondary storage management, security and protection, etc.

Course Contents

Unit - I

Introduction to the Operating System (OS), Types of Operating System: Batch System, Time Sharing System, Real Time System. Multi Programming, Distributed System, Functions and Services of OS. **(Lecture 08)**

Unit - II

Process Management: Process Concept, Process State, Process Control Block, Process Scheduling, CPU Scheduling - Scheduling Criteria, Scheduling Algorithms, Preemptive & Non Preemptive Scheduling. **(Lecture 08)**

Unit - III

Deadlocks-System model, Characterization, Deadlock Prevention, Deadlock Avoidance and Detection, Recovery from deadlock. **(Lecture 08)**

Unit - IV

Memory Management: Logical Address, Physical Address, External and Internal Fragmentation. Concept of paging, Page table structure - Hierarchical Paging, Hashed Page Tables, Inverted Page Table. **(Lecture 08)**

Unit -V

Information Management: File Concept, Access Methods, Directory Structure. Device Management: Disk Structure, Disk Scheduling Algorithms. **(Lecture 08)**

Text Books:

1.Silbershatz and Galvin," Operating System Concept", Addition We seley, 2002.
2.Nutt, G., “Operating Systems”, Addison-Wesley.
3.GodboleAhyut, "Operating System", PHI, 2003.

Reference Books:

1.Flynn, Mchoes, "Understanding Operating System", Thomson Press, Third Edition, 2003
2.Tannenbaum,"Operating System Concept", Addition Weseley, 2002.
3.Joshi, R. C. and Tapaswi, S., “Operating Systems”, Wiley Dreamtech.
*Latest editions of all the suggested books are recommended.

BCA - Semester III
FUNDAMENTALS OF DATABASE SYSTEMS

Course Code: BCA307/ICA306 **L-4, T-2, P-0, C-5**

Objective:
This syllabus design is an attempt to provide the basic information about database management system and their development. It will also provide the basic conceptual background necessary to design and develop simple database application. The major objectives of this subject are to:

- Provide an introduction of DBMS and their use;
- Describe the main features and function of the DBMS;
- Describe the features of relational database and E-R models;
- Implement SQL queries;
- Draw ER diagrams;
- Design database.

Course Contents

Unit - I
Introduction: Elements of Database System, Characteristics of database approach, File system versus Database System, Data models and Types, DBMS architecture and data independence. Features and Functions of Database System. **(Lecture 08)**

Unit - II
E-R Modeling: Entity types, entity set, attribute and key, relationships, relation types, roles and structural constraints, weak entities, relational schema ,enhanced E-R and overview of object modeling. Specialization and generalization. Basic concepts of relational algebra: Selection, Projection, Join, Union, Intersection, Divide, Minus. **(Lecture 08)**

Unit - III
Relational Data Model: Relational model concepts, relational constraints, relational algebra.
SQL: SQL queries, programming using SQL, Integrity Constraints, Roles and privileges, data definition, aggregate function, Null Values, nested sub queries, Joined relations. **(Lecture 08)**

Unit - IV
Logical view of data, keys, integrity rules. Relational Database design: features of good relational database design
Data Normalization: Functional dependencies, Normal form up to 3rd normal form & BCNF. **(Lecture 08)**

Unit - V
Concurrency Control: Transaction processing, locking techniques, database recovery, security and authorization. Overview of recovery techniques and Database Security. **(Lecture 08)**

Text books:
1. Silberschatz Abraham, Korth Henry &Sudarshan S., *Database Systems Concepts*, McGraw Hill,1997.
2. Elmarsi R. &Navathe S.B., *Fundamentals of Database Systems*, Addison Wesley, 2004

3. Date C.J., *An Introduction to Database Systems*, Addition Wiley.
4. Alexis Leon&Mathews Leon," Fundamentals of Database Management Systems ",LeonVikas Publication

Reference Books:

1. Melton Jim& Simon Alan, *Understanding the New SQL: A Complete Guide*, Morgan Kaufmann
Publishers, 1993.
2. Majumdar A. K. &Battacharya P., *Data Base Management Systems*, Tata McGraw Hill, 1996.
3. Bipin Desai, *An Introduction to Database Systems*, Galgotia Publications, 1991.

BCA - Semester III
SYSTEM ANALYSIS AND DESIGN

Course Code: BCA308/ICA307 **L-3, T-2, P-0, C-4**

Objective: This subject aims to provide an understanding of the role of system analysis and design within various systems development life-cycle, to develop an awareness of the different approaches that might be taken to system analysis and design and to understand the activities of the system analyst and system designer, and apply some current techniques.

Course Contents

Unit - I

System Definition and concepts: General Theory system, Manual and automated system, Real-life Business Sub-Systems. System Environments and Boundaries, Real-time and distributed system, Basic principles of successful system, Approach to system development: Structured System Analysis and Design, Prototype, Joint Application Development, Role and Need of System Analyst. **(Lecture 08)**

Unit - II

Introduction to System Development Life Cycle (SDLC), **Various phases of SDLC:** System Analysis, Design, Development, Implementation, Maintenance; Documentation: Principles of System Documentation, Types of documentation and their importance. **(Lecture 08)**

Unit - III

Data and fact gathering techniques: Interviews, Group Communication -Questionnaires; Assessing Project Feasibility: Technical, Operational, Economic and Cost Benefits Analysis. Modern Methods for determining system requirements: Joint Application Development Program, Prototyping, Business Process Re-engineering. System Selection Plan and Proposal **(Lecture 08)**

Unit - IV

Module specifications, Top-down and bottom-up design, Module coupling and cohesion, Structure Charts. Process Modeling, Logical and physical design, Conceptual Data Modeling: Entity /Relationship Analysis, Entity-Relationship Modeling, ERDs and DFDs. Process Description: Structured English, Decision Tree, Decision Table, Data Dictionary. **(Lecture 08)**

Unit - V

Classification of forms, Input/output forms design, User-interface design, Graphical interfaces. Standards and guidelines for GUI design, Designing Physical Files and Databases: Designing Fields, Designing Physical Records, Designing Physical Files, Designing Databases, System planning considerations, Conversion methods, procedures and controls, Testing and Validation, Preparing User Manual, Maintenance Activities and Issues. **(Lecture 08)**

Text Books:

1. E M Awad, 'Systems Analysis and design', Galgotia (P) Ltd.
2. Whitten J. L, Bentley L. D, 'Systems Analysis and Design Methods', Tata McGraw-Hill.
3. A. Dennis and B. H. Wixom, 'Systems Analysis and Design', John Wiley & Sons, Inc.

Reference Books:

1. A Hoffer, F George, S Valaciah, **'**Modern System Analysis & Design' Low Priced Edition, Pearson Education
2. V K Jain, 'Systems Analysis and design', Dreamtech Press

*Latest editions of all the suggested books are recommended.

BCA - Semester III
DATA STRUCTURE USING 'C' LAB

Course Code: BCA 354/ICA354 **L-0, T-0, P-4, C-2**

Course Contents

Program based on:

Array: Insertion of element in an array , deletion of element from an array.
Sorting : Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Two Way Merge Sort and Heap Sort.
Searching : Sequential search, binary search.

Stack: Array Representation and Implementation of stack, Operations on Stacks: Push & Pop, Conversion of Infix to Prefix and Postfix Expressions.

Queue: Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Circular queue

Linked list: Representation and Implementation of Singly Linked List, Traversing and Searching, Inserting and Deleting of Linked List. Same operation in Doubly Linked List, Circular Linked List.

Binary Search Tree: Creation, searching and traversal.

BCA - Semester III
DATABASE MANAGEMENT SYSTEM- LAB

Course Code: BCA353/ICA353 **L-0, T-0, P-4, C-2**

Course Contents

The Programme to be implemented using SQL:
1. Create Table, insert data into tables, Deletion,Updation
2. Retrieval of data using SQL statement with all possible clauses.
3. Using aggregate function
4. Using group by and having clause
5. Write query for Join, set operation, and nested queries.
6. Creating View

BCA - Semester IV
SOFTWARE ENGINEERING

Course Code: BCA402/ICA402 **L-4, T-2, P-0, C-5**

Objective: The study of this course will help students understand how to manage the development of industrial strength software. They will learn about various phases of software development and use of various development models for the same. They will learn concepts of software design, software testing and maintenance. They will learn about the role of software reliability and quality assurance

Course Contents

Unit -I
Introduction: Software Engineering approach, Need of engineering aspect for Software Design, SDLC, Software Crisis, Software Process, Process models (Classical Waterfall Model, Build-n-Fix Model, Iterative Waterfall Model, Prototyping Model, Evolutionary Model and Spiral Model) **(Lecture 08)**

Unit -II
Software Requirement Analysis and Specifications: Software Requirement Specifications, Need of SRS, Steps for constructing good SRS, Behavioral and Non-Behavioral requirements, Analysis Model **(Lecture 06)**

Unit -III
Software Design: Design Concepts & Principle, problem partitioning, abstraction, and top down and bottom up-design, Cohesion & Coupling, How to measure degree of Cohesion and Coupling, Function Oriented Design, DFDs, Structure Chart, Object Oriented Design.
Coding: Top-Down and Bottom–Up programming, Structured programming, Programming style, Do's and Don'ts for Coding **(Lecture 10)**

Unit -IV
Software Testing: Validation and Verification, Black Box testing approach, White Box testing approach, Levels of testing: Unit Testing, Integration Testing, Validation testing, System testing and debugging. **(Lecture 08)**

Unit -V
Software Maintenance: Software Maintenance Process and its types, Introduction to Reverse Engineering.
Software Reliability & Quality Assurance: Software Reliability issues, Software quality, Overview of Quality Standards like ISO 9001, SEI-CMM and its comparison with ISO, Introduction, scope and architecture of CASE. **(Lecture 08)**

Text Books:
1. Rajib Mall, "Software Engineering ", PHI
2. K.K.Agrawal & Yogesh Singh, "Software Engineering", New Age Publication
3. R. S. Pressman, "Software Engineering – A practitioner's approach", 3rd ed., McGraw Hill Int.Ed., 1992.

Reference Books:

1. Ian Sommerville. Software Engineering, Pearson Education (Addison Wesley),
2. P. Jalote, "An Integrated approach to Software Engineering", Narosa, 1991.
3. Waman S. Jawadekar,"Software Engineering: Principles and Practice", McGraw Hill

*Latest editions of all the suggested books are recommended.

BCA - Semester IV
OOPs & C++

Course Code: BCA404/ICA406 **L-4, T-2, P-0, C-5**

Objectives: To get a clear understanding of object-oriented concepts. To understand object oriented programming through C++ and to develop real life applications using Object Oriented Programming (OOP) concepts.

Course Contents

Unit - I
Introduction: Introducing Object-Oriented Approach, Relating to other paradigms (functional, data decomposition). Basic terms and ideas: Abstraction, Encapsulation, Inheritance, Polymorphism, Basic programming of C++. **(Lecture 08)**

Unit - II
Classes and Objects: Encapsulation, abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behavior of an object, Constructors and destructors, object types, Meta class, abstract classes. **(Lecture 08)**

Unit - III
Inheritance: Access specifiers, Types of inheritance, Ambiguity resolution in Multiple Inheritance, Constructor calling (Implicit and Explicit Constructor call) to base class, Containership and inheritance, Virtual Base Class. **(Lecture 08)**

Unit - IV
Friend: Friend Function, Friend Member Function and Friend Class.
Polymorphism: Function Overloading, Operator overloading, operator overloading using Friend. Virtual function & Pure Virtual function **(Lecture 08)**

Unit - V
File Handling: Stream Classes Hierarchy, Opening and closing FILE, Read and write in file. File pointers and Manipulations, Error Handling in File Operation,Command line Argument.
(Lecture 08)

Text Books:
1. Lafore R., *Object Oriented Programming using C++*, Galgotia
2. Venugopal A.R. & Rajkumar, T. Ravishanker,*Mastering C++*, Tata Mc Graw Hill, 1997.
3. Lippman S. B. & Lajoie J., *C++ Primer*, Addison Wesley, 3rd Edition, 2000.

Reference Books:
1. Parasons 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, 1999.
4. Tony Gaddis, Watters, Muganda, *Object-Oriented Programming in C++*, Dreamtech, 2004.
*Latest editions of all the suggested books are recommended.

BCA - Semester IV
TECHNICAL COMMUNICATION

Course code: BCA406/ICA409 **L-3, T-2, P-0, C-4**

Objective: To give the students understanding about general communication and technical communication.

Course Contents

Unit - I

Communication: Objectives of Communication, Need for Communication, Types of communication, written & Verbal communication, Formal and informal communication (The grapevine), upward and downward communication. **(Lecture 10)**

Unit - II

Business communication: Importance of written business correspondence, General principles and essentials of good commercial correspondence, Different types of commercial correspondence & their drafting, Types of Business letters, Official letters, electronic communication process. **(Lecture 10)**

Unit - III

Project, Thesis and Dissertation writing: Project Report, Thesis & Dissertation writing Stru cture of Thesis writing. **(Lecture 10)**

Unit - IV

Modern Technology and Communication: Globalization of Business, Role of Information Technology, Tele- communication, Internet, Tele-conferencing and Video-conferencing. **(Lecture 10)**

Text Books:

1. Mishra Sunita & Muraliksishra C., Communication Skills for Engineers– Pearson Education, New Delhi.
2. Raman Meenakshi & Sharma Sangeeta, Technical Communication-Principles & Practice – O.U.P. New Delhi. 2007.
3. Chabbra T N, Business Communication, Sun India Pub. New Delhi.

Reference Books:

1. Mohan Krishna & Banerji Meera, Developing Communication Skills – Macmillan India Ltd. Delhi. itra Barum K., Effective Technical Communication – O.U.P. New Delhi. 2006.
2. Sinha,Mosam., Effective Communication Skills, Aavishkar Publications,Jaipur,2010

* Latest editions of all the suggested books are recommended.

BCA - Semester IV
COMPUTER GRAPHICS

Course Code: BCA407/ICA407 **L-4, T-2, P-0, C-5**

Objective: This subject covers computer graphics concepts and basic techniques for operating with two- dimensional objects. It gives an overview of typical applications of computer graphics. On completion of this subject, the student will be able to understand and apply the basic principles, techniques, and algorithms for generating and interacting with simple graphical objects on display screen

Course Contents

Unit - I

Introduction Of Computer Graphics: Application areas of Computer Graphics, Overview of graphics systems. **Graphics primitives:** video-display devices, and raster-scan systems, random scan systems, Plasma displays, LCD, input devices, input techniques. **(Lecture 08)**

UNIT - II

Output Primitives: Points and lines, Line drawing algorithms: DDA, Bresenham's algorithm, Mid-point algorithm, Circle drawing algorithms: Mid-point algorithm, Bresenham's algorithm, Ellipse drawing Bresenham's algorithm, Filled area primitives: Scan line polygon fill algorithm, Boundary-fill and Flood-fill algorithms. **(Lecture 10)**

Unit - III

2-D Geometrical Transforms: Translation, rotation, scaling, reflection and shear transformations, homogeneous coordinate system, composite transforms, transformations between coordinate systems, Introduction of 3-D Transformation **(Lecture 10)**

Unit - IV

2-D Viewing: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland – Hodgeman polygon clipping algorithm, Curve clipping, Text clipping. (**Lecture 10)**

Unit - V

Computer Animation: Design of animation sequence, General computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications. **(Lecture 08)**

Text Books:

1. Donald Hearn & M.Pauline Baker, *Computer Graphics C Version*, Pearson Education
2. VanDam, Feiner & Hughes, *Computer Graphics Principles &Practice*, Pearson Education.
3. Steven Harrington, *Computer Graphics*, Tata McGraw Hill.
4.Schaum's Outline Computer Graphics,McGraw-Hill

Reference Books:

1. Donald Hearn & M.Pauline Baker, *Computer Graphics*, Prentice Hall of India.
2. Zhigand Xiang, Roy Plastock, Schaum's Outlines, *Computer Graphics*, Second Edition, Tata Mc-Graw Hill.
3. David F Rogers, *Procedural Elements for Computer Graphics*, Tata McGraw Hill,
4. Govil Shalin, *Principles of Computer Graphics*, PAI, Springer.
5. Steven Harrington, *Computer Graphics*, Tata McGraw Hill.
6. Amrendra N Sinha and Arun D Udai," Computer Graphics", TMH

BCA - Semester IV
FUNDAMENTALS OF ACCOUNTING

Course Code: BCA408/ICA408 **L-3, T-2, P-0, C-4**

Objective: The basic objective of this course is to provide fundamental knowledge of Accounting.

Course Contents

Unit - I

Accounting: Meaning and Concepts, Difference between accounting and book keeping, Importance and Limitations of Accounting, Users of Accounting information, Accounting Principles, Conventions and Concepts. **(Lecture 08)**

Unit - II

Subsidiary Books: purchase book, sales book, purchase return book, sales return book, debit note, credit note Types of accounts, golden rules of accounting, Preparation of Journal, Ledger and Trial balance. **(Lecture 08)**

Unit - III

Preparation of Final Accounts: Manufacturing Account, Trading Account, Profit and Loss Account, Balance Sheet (without adjustments). **(Lecture 08)**

Unit - IV

Common Size Statements: Comparative Financial Statements, Balance Sheet, Profit and Loss Account. **(Lecture 08)**

Unit - V

Preparation of Bank Reconciliation Statement **(Lecture 08)**

Text Books:

1. Maheswari S.N. & Maheswari S. K., Introduction to Financial Accountancy, Vikas Publications
2. Grewal. T.S. ,Fundamentals of Accounting, Sultan chand & Sons Pvt Ltd New Delhi
3. Goel D.K. , Introduction to Accounting

Reference Books:

1. Jawahar Lal, Financial Accounting, Wheeler Publishing.
2. Gupta R.L. & Radhaswamy-Fundamentals of Accounting
3. Chawla & Jain-Financial Accounting

BCA - Semester IV
OOPs & C++ LAB

Course code: BCA452/ICA453 **L-0, T-0, P-4, C-2**

Course Contents

Write programs in C++ for

1. Program illustrating basic input/output operations using CIN, COUT.
2. Implementing class and objects.
3. Implementing function overloading.
4. Implementing various constructors and destructor
5. Program illustrating overloading of various operators.
6. Program illustrating use of Friend, Inline, Static Member functions, default arguments.
7. Program illustrating various forms of Inheritance
8. Program illustrating use of virtual functions, virtual Base Class.
9. Program illustrating use of file handling

BCA - Semester IV
COMPUTER GRAPHICS LAB

Course Code: BCA453/ICA454 **L-0, T-0, P-4, C-2**

Course Contents:

1. Programs for designing objects in graphics by using Library functions.
2. Programs to draw the line, circle by using algorithms.
3. Programs to fill polygons by using algorithms.
4. Programs to implement line clipping.
5. Programs to implement 2-D transformation on objects.
6. Programs to do basic animation by using graphics.

BCA - Semester V
VB.NET

Course Code: BCA502/ICA508 **L-4, T-2, P-0, C-5**

Objective: The objective of learning vb.net is to provide a platform to students so that they can utilize their skills in this competitive and technological era. This is the age of computer and computer made our work easy by the use of software like system software, application software and utility software. Obviously this programming language will help the student to groom and furnish their talent and they can serve the overall growth of organization or nation.

Course Contents

Unit- I
NET Framework: Introduction, Common Language Runtime, Common Type System, Common , Language Specification, Base Class Library, .NET class library Intermediate language, Just in-Time compilation, Garbage Collection, Application installation & Assemblies.
VB.NET IDE: Start Page, Menu and Tool Bar, Toolbox, Solution Explorer, Properties Window, Task List and Output Window, Server Explorer. **(Lecture 08)**

Unit -II
Variables, Constants, Keywords, Data types, Operators, Decisions with if statement, Select Case statements, Loops, Arrays.
Strings: Substring Method, Trim Method, Equals, Replace and Insert Methods, Split and Join Method, InStr Method. **(Lecture 08)**

Unit-III
An Introduction to Functions and Subs, Create your own Subs , Create a Function ,Class and Objects, Create Properties in your Classes, Error Handling, Working with Textbox, Buttons, Labels, Checkbox, Radio Buttons, List box, Combo Box, Picture Box, Menu, Events: The Click Event, The Key Down Event, The Form Load Event **(Lecture 08)**

Unit- IV
ADO.NET: ADO.NET Data Namespaces, SqlConnection, SqlCommand, SqlDataAdapter, DataSet Class, Data View.
ASP.NET: Introduction to ASP.NET Web Forms, Implementation of ASP.NET controls: Dropdown List, Textbox, Button, Checkbox, Radio Button. **(Lecture 08)**

Unit -V
Working with Text Files: Introduction to Text File, Open Text File, Read Text File Line by Line, Write to Text File in VB .NET, Appending Text to File, Copy File, Move File, Delete File. **(Lecture 07)**

Text Books:
1. Blair Richard & Crosland Jonathan,*Beginning VB.NET (2 Edition)*, WROX
2. Steven Holzner, *Visual Basic NET 2003*, Pearson Education
3. Shouish Chavan, *Visual Basic NET*, Pearson Education

Reference Books:

1. Jeffrey Richter, *Applied Microsoft Net Framework Programming*, Microsoft
2. Blair Richard & Crosland Jonathan *Professional VB.NET*, Willy
3. Fergal Grimes, *Microsoft Net for Programmers*, SPD

*Latest editions of all the suggested books are recommended.

BCA - Semester V
COMPUTER NETWORKS

Course Code: BCA503/ICA507 **L-4, T-2, P-0, C-5**

Objective: The Objective of this subject is to provide the Fundamental Knowledge of Computer Networks and to provide the knowledge of some recent trends in Computer Networks.

Course Contents

Unit - I
Introductory Concepts: Goals and Applications of Networks, Network structure and architecture, the OSI reference model, services, networks topology, Physical Layer- transmission, switching methods, Integrated services digital networks. **(Lecture 08)**

Unit - II
Medium access sub layer: Channel allocations, LAN protocols, ALOHA Protocols- Pure ALOHA, slotted ALOHA, Carrier Sense Multiple Access Protocols, CSMA with Collision Detection, Collision free Protocols, IEEE standards, Ethernet, Error correction & detection algorithms, elementary data link layer protocols, sliding window protocols, error handling, High Level Data Link Control . **(Lecture 09)**

Unit-III
Network Layer: Point-to Point networks, concept of virtual circuit and LAN, routing algorithms, congestion control algorithms, internetworking, TCP/IP protocol, UDP, SCTP, IP addresses, IPv6 Packet Format , Subneting. **(Lecture 08)**

Unit-IV
Transport Layer: Design issues, connection management, Internet Transport Protocol (UDP), Ethernet transport Protocol, Transmission Control Protocol. (TCP). **(Lecture 07)**

Unit-V
Application Layer: Domain Name System, Simple Network Management Protocol, Electronic mail, File Transfer Protocol, Hyper Text Transfer Protocol, Introduction to Cryptography and Network Security Communication Security (IPSec, Firewalls). Implement a program in for encryption a text with network security algorithm. **(Lecture 08)**

Text Books:

1. Computer Networks by A. S Tanenbaum, 4th , Edition", Pearson education
2. Data and Computer Communication by W. Stallings, Macmillan Press
3. Computer Networks & Internet with Internet Applications by Comer Pearson Education
4. Internetworking with TCP/IP by PHI
5. Data Communication and Networking by Forouzan TMH

Reference Books:

1. Computer Networks with Internet Protocols by W Stallings, Pearson Education
2. Local and Metropolitan Area Networks by W Stallings, VIth edition, Pearson Education

*Latest editions of all the suggested books are recommended.

BCA - Semester V
SOFTWARE PROJECT MANAGEMENT

Course Code: BCA509/ICA506 **L- 4, T-2, P-0, C-5**

Objective: The study of this course will help students understand how to manage the complexity in developing industrial strength software. They will learn about various aspects of software project planning. They will learn concepts of Project Organization and Scheduling, Project Monitoring and Control, Software Configuration Management and the like that holds value for developing a quality software.

Course Contents

Unit -I
Introduction and Software Project Planning, Fundamentals of Software Project Management (SPM), Need Identification, Vision and Scope document, Project Management Cycle, SPM Objectives, Management Spectrum, SPM Framework, Software Project Planning, Planning Objectives, Project Plan, Types of project plan, Structure of a Software Project Management Plan, Software project estimation, Estimation methods. **(Lecture 08)**

Unit -II
Project Organization and Scheduling Project Elements, Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle, Ways to Organize Personnel, Project schedule, Scheduling Objectives, Building the project schedule, Scheduling terminology and techniques, Network Diagrams: PERT, CPM, Bar Charts: Milestone Charts, Gantt Charts. **(Lecture 08)**

Unit -III
Project Monitoring and Control, Dimensions of Project Monitoring & Control, Earned Value Analysis, Earned Value Indicators: Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI), Schedule Performance Index (SPI), Interpretation of Earned Value Indicators, Error Tracking, Software Reviews, Types of Review: Inspections, Deskchecks, Walkthroughs, Code Reviews. **(Lecture 08)**

Unit -IV
Software Quality Assurance and Testing, Testing Objectives, Testing Principles, Test Plans, Test Cases, Types of Testing, Levels of Testing, Test Strategies, Program Correctness, Program Verification & validation, Testing Automation & Testing Tools, Concept of Software Quality, Software Quality Attributes, Software Quality Metrics and Indicators, The SEI Capability Maturity Model CMM), SQA Activities. **(Lecture 08)**

Unit -V
Project Management and Project Management Tools, Software Configuration Management: Software Configuration Items and tasks, Baselines, Plan for Change, Change Control, Change Requests Management, Version Control. Risk Management: Risks and risk types, Risk Breakdown Structure (RBS). Risk Management Process: Risk identification, Risk analysis, Risk planning, Risk monitoring, Cost Benefit Analysis. Software Project Management Tools: CASE Tools, Planning and Scheduling Tools, MS-Project. **(Lecture 08)**

Text Books:

1. M. Cotterell, 'Software Project Management', McGrawHill
2. S A Kelkar, 'Software Project Management: A Concise Study', PHI

Reference Books:

1. Kathy Schwalbe, 'Information Technology Project Management', CENGAGE

*Latest editions of all the suggested books are recommended.

BCA - Semester V
MULTIMEDIA AND ANIMATION

Course Code: BCA510/ICA509 **L-4, T-2, P-0, C-5**

Objective: To give the knowledge of multimedia basics and it's tools with the familiarity of animation.

Course Contents

Unit –I

Multimedia Basics: Evolution of Multimedia and its objects, Uses of Multimedia in different fields of specification, Multimedia hardware, Multimedia Software, Different stages to Design and Produce a multimedia application, Memory and Storage Devices, Communication Devices, Presentation and Object Generation Tools. **(Lectures 08)**

Unit-II

Multimedia Components: *Text*-Character sets and general guidelines.

Graphics: Vector Drawing, Digital Image and it's Characteristics. Image File Formats: BMP, JPEG, GIF, TIFF, PNG. Image Capturing.

Audio: Analog Sound, Digital Audio, Digital Audio Concepts, Sampling Variables, MIDI Sound, MIDI under Windows Environment, Audio File Formats, Audio Capturing. Video-Analog and Digital Video, Characteristics of Digital Video, Video Capturing. **(Lectures 08)**

Unit-III

Data Compression: Lossless Compression Algorithm: Run Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, JPEG Standards, JPEG Compression, Lossy Compression Algorithms: Quantization, Transform Coding. **(Lectures 08)**

Unit-IV

Audio and Video Compression: Lossy and Lossless Compression of Audio, Multimedia Monitor Bitmaps, Color Models, Video Representation, Video Compression Techniques, Video Compression based on motion Compensation, JPEG Standards **(Lectures 08)**

Unit-V

Animation: Basics of Animation: Keyframes, In-between Frames, Timeline, Motion Tweening, Reverse Frames, Types of Animation, Drawing Techniques ,Basic Animation Software-Macromedia and Adobe Products, Layer Concepts, Scene sequence and It's formation using multi layers **(Lectures 08)**

Text Books:

1. Tay Vaughan, *Multimedia-Making it Work,*TMH Publication
2. Ze Nian Li and Mark S.Drew,*Fundamentals of Multimedia,* PHI/Pearson Education
3. Sujata Pandey, Manoj Pandey, *Multimedia (System, Technology and Communicatio*n), S.K.Kataria & Sons.

Reference Books:

1. Gundavarma Shishir, *CGI Programming on the World Wide Web*, O'Reilly & Associate.
2. David Hilman ,*Multimedia Technology and Applications*, Galgotia
3. Steinmetz,Nahrstedt,*Multimedia Applications*, Springer

*Latest editions of all the suggested books are recommended.

BCA - Semester V
MINI PROJECT
(INDUSTRIAL TRAINING)

Course Code: BCA551/ICA555 **L-0, T-0, P-0, C-3**

Evaluation Process

Project Guide/Supervisor of the project will be nominated by Head of Department and the internal evaluation shall be done by three faculty members committee nominated by the Director of the college. The external evaluation will be done by the external examiner arranged by examination branch of the university.

BCA - Semester V
VB.NET LAB

Course Code: BCA552/ICA553 **L-0, T-0, P-4, C-2**

Course Contents

Level-01 (CONSOLE APPLICATION)

1. WCP to display a message “HELLO INDIA” on console.
2. WCP to perform arithmetic operation.
3. WCP to find whether a year is leap or not.
4. WCP to find the grades of a student according to their scores.
5. WCP to find factorial using for, while, do..while loops.
6. WCP to print table from 1-10.
7. WCP to perform various string operations.
8. WCP to identify choice of user using select..case.
9. WCP to declare & initialize various types of variables.
10. WCP to find the largest number among three numbers.
11. WCP to find maximum element in array a of size n.
12. WCP to find minimum element in array a of size n.
13. WCP to find LCM of two numbers.
14. WCP to find GCD of two numbers.
15. WCP to convert decimal to binary numbers.
16. WCP to swap two numbers.
17. WCP to sort an array.
18. WCP to add two matrices.
19. WCP to multiply two matrices.
20. WCP to implement function.
21. WCP to create a class to manage student marks record.
22. WCP to implement try..catch..finally.
23. WCP to print

```
*

* *

* * *

* * * *
```

24. WCP to print

```
1

12

123

1234
```

25. WCP to print

```
   1
  21
 321
4321
```

26. WCP to print

```
1
2 2
333
4444
```

27. WCP to print

```
   1
  22
 333
4444
```

28. WCP to print

```
1
1 8
1 8 27
1 8 27 64
```

Level-02(WINDOW APPLICATION)

1. WWP to find the area of a circle by using required window controls.
2. WWP to calculate sum of the digits of number entered by the user.
3. WWP to find reverse of a number entered by the user.
4. WWP to enter any number and check whether the no is palindrome or not.
5. WWP to enter any number and check whether the number is perfect or not.
6. WWP to enter any number and check whether the number is prime or not.
7. WWP to copy text of one textbox into another.
8. WWP to align text left, right & center in textbox.
9. WWP to implement rich textbox.
10. WWP to clear all textboxes by using for each loop.

11. WWP to implement message box(YES/NO type) on button click event.
12. WWP to show data in grid view from Ms-Access table.
13. WWP to implement login form.
14. WWP to copy list item from one to another.
15. WWP to find which checkbox is checked.
16. WWP to find which radio button is selected in a group.
17. WWP to load image in picture box.
18. WWP to find which combo box item is selected.
19. WWP to show data in combo box from Ms-Access table.
20. WWP to implement calculator.
21. WWP to validate textbox for empty value.
22. WWP to validate textbox for integer value.
23. Write a web based program to insert record in database of employees having fields namely empid, empname and empsalary.
24. Write a web based program to bind the values in dropdown list through coding.
25. Write a web based program to display the record of the employees in asp.net gridview.

BCA - Semester V
MULTIMEDIA AND ANIMATION LAB

Course Code: BCA 554/ICA554 **L-0, T-0, P-4, C-2**

ADOBE PHOTOSHOP

- Introduction to Photoshop
- Study of Basic Tools
- Create a Photoshop file
- Save an image in different configuration,
- Introduction to Layers
- Feather and Opacity
- Layer Styles
- Duplicate Layer
- Layer Palette
- Masking of layers
- Blending Modes
- Selection and its types
- Generating Color Effects with Gradient
- Swatches and Styles
- Filter Effect in a Layer

ADOBE FLASH

- Introduction to Flash
- Vector and Bitmap Graphics
- Creating Key frames
- Representation of Animation in Timeline
- Frame Rates
- Frame-by-Frame Animation
- Using Timeline Effects
- Twinned Animation
- Working with Text
- Onion Skinning

BCA - Semester VI
WEB TECHNOLOGY WITH PHP

Course Code: BCA605/ICA605 **L-4, T-2, P-0, C-5**

Objective: PHP is the latest trend in the IT sector and this course is designed to make the students aware of the web development standards and technologies, and to make them ready for developing the web applications with the help of PHP as a language. At the completion of this course the students will be able to attain good job in web development sector. Also by this course they will know, the current web development trend in the IT sector.

Course Contents

Unit - I
Web Essentials: Clients, Servers, and Communication. The Internet Protocols, HTTP, HTTPS, Markup Languages: An Introduction to HTML, History-Versions, Overview of XML and its benefits. **(Lecture 08)**

Unit - II
Style Sheets: CSS-Introduction to Cascading Style Sheets, Features, Style Sheets and HTML Style Rule, Introduction to JavaScript, Syntax, Variables and Data Types, Statements, Operators, Literals, Functions, Objects, Arrays. **(Lecture 08)**

Unit - III
PHP-Introduction to PHP, History, WebServer, WAMP, Installation and Configuration files, Syntax, Operators, Variables, Constants, Control, Structure, Language construct and functions, Function – Syntax, Arguments, Variables, References, Returns and Variable Scope.
(Lecture 08)

Unit - IV
Arrays and its types, Date and Time functions, OOP's – Instantiation, Modifiers, Inheritance, Interfaces, Exceptions, Static Methods and Properties, String functions. Web Features- Sessions, Forms, GET and POST data, Cookies. **(Lecture 08)**

Unit - V
Introduction to AJAX, AJAX and its applications, working of AJAX, Introduction to web services, advantages of web services, web services platform elements, Introduction to MySQL, Database connectivity in PHP and its types, insertion, deletion, updating and retrieval of data from database using PHP. **(Lecture 08)**

Text Books:
1. Ivan Bayross, HTML, DHTML, JavaScript, CSS, PHP, BPB Publications.
2. Ivan Bayross, PHP 5, BPB Publications
3. Andrew Curioso,Ronald Bradford,Patrick Galbraith, Expert PHP and Mysql, Wiley Publishing

Reference Books:

1. Professional PHP Programming,Jesus Castagnetto,Harish Rawat, Sascha Schumann,Chris Scollo,Deepak Veliath - Wrox Publications
2. Beginning PHP and MySQL 5,W. Jason Gilmore,Apress Publication
3. PHP 5 Advanced, Larry Ullman, Peachpit Press

*Latest editions of all the suggested books are recommended.

BCA - Semester VI
COMPUTER, ETHICS AND SOCIETY

Course Code: BCA606/ICA606 **L-4, T-2, P-0, C-5**

Objective: The course is designed by keeping the perspectives as:

- Acquaint student with contemporary and possible future moral problems that arise due to computerization
- Give a deeper understanding of nature of moral choices
- Help to understand social, economic, legal and cognitive effects of technology
- To identify ethical conflicts and think through the implications of possible solutions to ethical conflicts

Course Contents

Unit I

Computer Ethics: Introduction to Computer Ethics, Technology and ethics, Computer Ethics and Morality, Ethical Decision Making in Computing, Computer Crime, types of Computer Crime, Computer Criminals, Computer Fraud, Hackers and Hacking. **(Lecture 08)**

Unit II

Cyber terrorism, Cyber Laws, Investigation and Ethics: Cyber Crime, Information Security and Law, Types & overview of Cyber Crimes, Cyber Law Issues in E-Business Management, Overview of Indian IT Act, Surveillance Technology. **(Lecture 08)**

Unit III

Intellectual Property Right (IPR), Ethical Issues in Intellectual property rights, Basic procedural steps for creation of IPR, Copy Right, Patents, Registration, Trademark, License, Data privacy and protection, Domain Name, Software piracy, Plagiarism, Issues in ethical hacking.

(Lecture 08)

Unit IV

Computer Reliability, Intelligent Machines: ROBOTs, ATMs, Kiosk, Impact on Society: Future Schools, Electronic learning, Virtual reality, Computer Games, Internet pornography, Electronic voting, Environmental problems. **(Lecture 08)**

Unit V

Ethics and the Internet: Technological and social changes, Democratic values in the Internet, Computer related Code of Ethics, Ethical Decision making progress, cases concerning Internet based ethics and code of conduct. **(Lecture 08)**

Text Books:

1. M. David Ermann, Michele S. Shauf, “Computers, Ethics and Society”, 3rd ed., Oxford University Press
2. Deborah G. Johnson, “Computer Ethics”, Pearson Education
3. Donald H. Sanders, “Computers in Society”, McGraw-Hill Companies

Reference Books:

1. Richard S. Rosenberg, “The Social Impact of Computers”, Elsevier Academic Press

*Latest editions of all the suggested books are recommended.

BCA- Semester VI
CORE JAVA PROGRAMMING

Course Code: BCA607/ICA607 **L-4, T-2, P-0, C-5**

Objective: The main objective of this course is to provide a straight forward way for the students to get their minds around Java and object-oriented programming. It also helps the students to get hands on experience on Java and to develop the cross platform applications. This course covers all the necessary topics that any students require to create an application in Java.

Course Contents

Unit -I

An Introduction to Java: Java Platform, Buzzwords, Short History on Java, Installing JDK, Setting the PATH.

Fundamental Programming Structures: A Simple Java program, Data Types, Variables, Operators, Control Flow, Arrays, Big Numbers.

Objects and Classes: Introduction to Object Oriented Programming, Defining Your Own class, Introducing Methods, Method Overloading, Constructors, Argument Passing Mechanism, Object Destruction and Finalize, Understanding static. **(Lecture 08)**

Unit-II

Inheritance: Base class, Super class and Sub class, Object class, super keyword, Method Overriding, Dynamic Method Dispatch, Abstract Classes, final keyword.

String Handling, Packages and Interfaces, Access Specifiers, Exception Handling, Input / Output. **(Lecture 08)**

Unit- III

Graphics Programming: Applet Fundamentals, Introducing AWT, Working with Frame, Working with Graphics, Working with Shapes, Using Colors, Displaying Image.

Event Handling: Basics of Event Handling, Delegation Event Model, Event Classes, Event Listener Interfaces, Handling Mouse Events.

AWT Controls: Button, Label, Checkbox, CheckboxGroup, Choice, List, Scrollbar, TextField, TextArea, Menu Bar and Menu.

Introduction to Layout Management: Flow Layout, Border Layout, Grid Layout, GridBag Layout. **(Lecture 08)**

Unit -IV

Swings: Swings Overview, Creating a Swing Applet and Application.

Swing Components: Icon, JLabel, JTextField, JTextArea, JPasswordField, JButton, JCheckBox, JRadioButton, JComboBox, JList, JProgressBar, JMenubar, JMenu, JToolBar, JScrollPane, JPanel, JTable, JSlider, JInternalFrame, Dialog Boxes. **(Lecture 08)**

Unit -V

Multithreading: Threads, Interrupting Threads, Thread States, Thread Priorities, Synchronization, Using Threads and Swings.

JDBC: Introduction to JDBC, Types of JDBC Drivers, JDBC-ODBC Bridge, Connecting to a database, Inserting and Retrieving Data from the Database.

Utilities: Using JAR and JAVADOC utilities. **(Lecture 08)**

Text Books:

1. Patrick Naughton & Herbert Schildt, *The Complete Reference JAVA2,* Tata Mc Graw Hill
2. Cay S. Horstmann & Gary Cornell, *Core Java 2 Volume I – Fundamentals*, PHI

Reference Books:

1. Balagurusamy E., *Programming in JAVA*, Tata McGraw Hill
2. Steven Holzner, *Java2 Black Book*, Dreamtech
3. Mark Wutica, "Java Enterprise Edition", QUE

*Latest editions of all the suggested books are recommended.

BCA - Semester VI
MANAGEMENT INFORMATION SYSTEM

Course Code: BCA608/ICA602 **L-4, T-2, P-0, C-5**

Objective: The Management Information system is an idea which is associated with man, machine, marketing and methods for collecting information's from the internal and external source and processing this information for the purpose of facilitating the process of decision-making of the business. In this process, computer has added on more dimensions such as speed, accuracy and increased volume of data that permit the consideration of more alternatives in decision making process.

Course Contents

Unit -I
An Overview of Management Information Systems: Types of information systems, Definition of a management information system, Concept of an MIS, MIS & Decision Support Systems. **(Lecture 08)**

Unit -II
Information System: End user and Enterprise Computing, Computer Peripherals, Application software and System software, Technical foundation of database management, managing data Resources. **(Lecture 08)**

Unit -III
Foundation of Information Systems in Business: Information system in business. The Components of Information system, Fundamentals of strategic advantage, Using Information for strategic advantage. **(Lecture 08)**

Unit -IV
Business Applications of Information Technology: Internet & Business, Intranet, Extranet & Enterprise Solutions, Information System for Managerial Decision Support. **(Lecture 08)**

Unit -V
Managing Information Technology: Managing Information Resources and technologies, Global information technology, Security and control Issues in Information system, ethical and societal challenges of IT. **(Lecture 08)**

Text Books:
1. Brian O., *Management Information System*, Tata McGraw Hill
2. Gordon B., Davis &Margrethe H. Olson, *Management Information System*, Tata McGraw Hill
3. Brian O., *Introduction to Information System*, McGraw Hill.

References Books:
1. Murdick, *Information System for Modern Management*, PHI.
2. Jawadekar, *Management Information System*, Tata McGraw Hill.
3. Jain Sarika, *Information System*, PPM
4. Davis, *Information System*, Palgrave Macmillan
*Latest editions of all the suggested books are recommended.

BCA - Semester VI
PROJECT WORK

Course Code: BCA 653/ICA654 **L-0, T-0, P-0, C-3**

Project work to be carried out on either of the following categories:
1. Client Server Based (VB.Net/Java)
2. MIS Based (VB.Net/Java/C/C++)

Evaluation:

Project Guide/Supervisor of the project will be nominated by Head of Department and the Internal evaluation shall be done by three faculty members committee nominated by the Director of the college. The external evaluation will be done by the external examiner arranged by examination branch of the university.

BCA- Semester VI
WEB TECHNOLOGY WITH PHP LAB

Course Code: BCA 654/ICA655 **L-0, T-0, P-4, C-2**

Course Contents

1. Using various HTML Tags
2. Rendering tags in different browsers.
3. Combining JavaScript with HTML – Form Validation, User Input, Form Submission,etc
4. Creating CSS to combine with JavaScript.
5. Using AJAX
6. Using XMLHttpRequest objects within a Javascript code
7. AJAX based form validation
8. Loading a html page within a div tag using AJAX
9. Dynamic Data Loading using AJAX on a form
10. Creating Auto-suggest Text field using AJAX
11. Creating database driven web pages in PHP.
12. Creating PHP pages using sessions and cookies.
13. Creating classes in PHP.
14. Creating instantiation, inheritance, interface and modifiers
15. Form Submission through GET and POST method.
16. File reading and writing programs.

*Latest editions of all the suggested books are recommended.

BCA- Semester VI
CORE JAVA PROGRAMMING LAB

Course Code: BCA655/ICA656 **L-0, T-0, P-4, C-2**

1. Developing simple console application in Java.
2. Programs based on loops, arrays, operators and big numbers.
3. Programs based on Classes and Objects.
4. Programs based on Method Overloading, Constructors.
5. Simple application based on static keyword.
6. Programs based on Inheritance.
7. Programs based on Method Overriding, Dynamic Method Dispatch, Abstract Classes.
8. Programs based on String Handling.
9. Simple application to demonstrate the working of Packages.
10. Developing a Simple Applet.
11. An applet to demonstrate the working of Mouse Events.
12. Programs based on the usage of all AWT controls.
13. A simple application to demonstrate the working of Frames.
14. A simple swing application.
15. Programs to demonstrate event handling on various swing components.
16. Programs based on applets and multithreading.
17. A simple application to retrieve and insert records in MS-Access database.
18. A simple application to retrieve and insert records in My-SQL database.
19. Use of JAR and JAVADOC utilities.

Evaluation Practical Lab:
Comprehensive Viva Voce will be conducted by a Board of Examiners comprising the Director/Dean and two external experts, of whom one would be preferably from the industry. The quorum shall be deemed to have been met if 2 out of 3 members are present.