

GITAM UNIVERSITY
(Estd. u/s 3 of the UGC Act, 1956)

CURRICULUM AND SYLLABI
of
BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

Program Code: SURCA200800



DEPARTMENT OF COMPUTER SCIENCE

REGULATIONS

(w.e.f. 2008-09 admitted batch)

1.0 ADMISSIONS

- 1.1 Admissions into B C A programme of GITAM University are governed by GITAM University admission regulations.

2.0 ELIGIBILITY CRITERIA

- 2.1 A pass in any 10 +2 or equivalent examination. Approved by GITAM University with Physics Chemistry and Mathematics.
- 2.2 Admissions into B.C.A will be based on than all India Entrance Test conducted by GITAM University and rule of reservation wherever applicable

3.0 STRUCTURE OF THE B.C.A. PROGRAMME

- 3.1 The Programme of instruction consists of:
- (i) A core programme imparting to the student specialization of computer applications.
 - (ii) An elective programme enabling the students to take up a group of departmental courses of interest to him/her.
 - (iii) Carry out a technical project approved by the Department and submit a report.
- 3.2 Each academic year consists of two semesters. Every branch of the B.C.A. programme has a curriculum and course content (syllabi) for the courses recommended by the Board of Studies concerned and approved by Academic Council.

4.0 CREDIT BASED SYSTEM

- 4.1 Each course is assigned certain number of credits which will upon number of contact hours (lectures & tutorials) per week.
- 4.2 In general, credits are assigned to the courses based on the following contact hours per week per semester.
- One credit for each Lecture /Tutorial hour.
 - One credit for two hours of Practicals.
 - Two credits for three (or more) hours of Practicals.
- 4.3 The curriculum of B.C.A. programme is designed to have a total of 132 credits for the award of B.C.A. degree.

5.0 MEDIUM OF INSTRUCTION

The medium of instruction (including examinations and project reports) shall be English.

6.0 REGISTRATION

Every student has to register himself/herself for each semester individually at the time specified by the Institute / University.

7.0 CONTINUOUS ASSESSMENT AND EXAMINATIONS

7.1 The assessment of the student's performance in each course will be based on continuous internal evaluation and semester-end examination. The marks for each of the component of assessment are fixed as shown in the Table 2.

Table 2: Assessment Procedure

S.No.	Component of assessment	Marks allotted	Type of Assessment	Scheme of Examination
1	Theory	40	Continuous evaluation	(i) Two mid semester examinations shall be conducted for 10 marks each. (ii) Two quizzes shall be conducted for 5 marks each. (iii) 5 marks are allotted for assignments. (iv) 5 marks are allotted for attendance
		60	Semester-end examination	The semester-end examination in theory courses will be for a maximum of 60 marks.
	Total	100		
2	Practicals	100	Continuous evaluation	(i) 40 marks are allotted for record work and regular performance of the student in the lab. (ii) One examination for a maximum of 20 marks shall be conducted by the teacher handling the lab course at the middle of the semester (iii) One examination for a maximum of 40 marks shall be conducted at the end of the semester (as scheduled by the Head of the Department concerned).
3	Project work	100	Project evaluation	(i) 50 marks are allotted for continuous evaluation of the project work throughout the semester by the guide. (ii) 50 marks are allotted for the presentation of the project work & viva-voce at the end of the semester.*

* Head of the Department concerned shall appoint two examiners for conduct of the examination.

8.0 RETAOTALLING, REVALUATION & REAPPEARANCE

- 8.1 Retotalling of theory answer script of the end semester examination is permitted on a request made by the student by paying the prescribed fee with in ten days of announcement of the result
- 8.2 Revaluation of theory answer script of end semester examination is also permitted on a request made by the student by paying the prescribed fee with in ten days of announcement of the result
- 8.3 A Student who has secured 'F' Grade in any theory course / Practicals of any semester shall have to reappear for the semester end examination of that course / Practicals along with his / her juniors.
- 8.4 A student who has secured 'F' Grade in Project work shall have to improve his report and reappear for viva – voce Examination of project work at the time of special examination to be conducted in the summer vacation after the last academic year.

9.0 SPECIAL EXAMINATION

- 9.1 A student who has completed the stipulated period of study for the degree programme concerned and still having failure grade ('F') in not more than 5 courses (Theory / Practicals), may be permitted to appear for the special examination, which shall be conducted in the summer vacation at the end of the last academic year.
- 9.2 A student having 'F' Grade in more than 5 courses (Theory/practicals) shall not be permitted to appear for the special examination.

10.0 ATTENDANCE REQUIREMENTS

- 10.1 A student whose attendance is less than 75% in all the courses put together in any semester will not be permitted to attend the end - semester examination and he/she will not be allowed to register for subsequent semester of study. He /She has to repeat the semester along with his / her juniors.
- 10.2 Condonation to a maximyum of 9% of attendance will be permitted on genuine medical grounds by the Vice Chancellor on the recommendation of the Principal / Director of the University College / Institute concernedon payment of prescribed fee.

11.0 GRADING SYSTEM

- 11.1 Based on the student performance during a given semester, a final letter grade will be awarded at the end of the semester in each course. The letter grades and the corresponding grade points are as given in Table3.

Table 3: Grades & Grade Points

Grade	Grade points	Absolute Marks
O	10	90 and above
A+	9	80 – 89
A	8	70 – 79
B+	7	60 – 69
B	6	50 – 59
C	5	40 – 49
F	Failed, 0	Less than 40

- 11.2 A student who earns a minimum of 5 grade points (C grade) in a course is declared to have successfully completed the course, and is deemed to have earned the credits assigned to that course.

12.0 GRADE POINT AVERAGE

- 12.1 A Grade Point Average (GPA) for the semester will be calculated according to the formula:

$$\text{GPA} = \frac{\sum [C \times G]}{\sum C}$$

Where

C = number of credits for the course,
G = grade points obtained by the student in the course.

- 12.2 Semester Grade Point Average (SGPA) is awarded to those candidates who pass in all the courses of the semester.
- 12.3 To arrive at Cumulative Grade Point Average (CGPA), a similar formula is used considering the student's performance in all the courses taken in all the semesters completed up to the particular point of time.
- 12.4 The requirement of CGPA for a student to be declared to have passed on successful completion of the M C A programme and for the declaration of the class is as shown in Table 4.

Table 4: CGPA required for award of Degree

Distinction	≥ 8.0*
First Class	≥ 7.0
Second Class	≥ 6.0
Pass	≥ 5.0

* In addition to the required CGPA of 8.0, the student must have necessarily passed all the courses of every semester in **first attempt**.

13.0 ELIGIBILITY FOR AWARD OF THE B C A DEGREE

13.1 Duration of the programme :

A student is ordinarily expected to complete the B.C.A. programme in six semesters of three years. However a student may complete the programme in not more than five years including study period.

13.2 However the above regulation may be relaxed by the Vice Chancellor in individual cases for cogent and sufficient reasons.

13.3 Project dissertation shall be submitted on or before the last day of the course. However, it can be extended up to a period of 6 months maximum, with the written permission of the Head of the Department concerned.

13.4 A student shall be eligible for award of the B.C.A. degree if he / she fulfils all the following conditions.

- a) Registered and successfully completed all the courses and projects.
- b) Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of his/her study within the stipulated time.
- c) Has no dues to the Institute, hostels, Libraries, NCC / NSS etc, and
- d) No disciplinary action is pending against him / her.

13.5 The degree shall be awarded after approval by the Academic Council.

RULES

1. With regard to the conduct of the end-semester examination in any of the practical courses of the programme, the Head of the Department concerned shall appoint one examiner from the department not connected with the conduct of regular laboratory work, in addition to the teacher who handled the laboratory work during the semester.
2. In respect of all theory examinations, the paper setting shall be done by an external paper setter having a minimum of three years of teaching experience. The panel of paper setters for each course is to be prepared by the Board of Studies of the department concerned and approved by the Academic Council. The paper setters are to be appointed by the Vice Chancellor on the basis of recommendation of Director of Evaluation / Controller of Examinations.
3. The theory papers of end-semester examination will be evaluated by internal/external examiner
4. Panel of examiners of evaluation for each course is to be prepared by the Board of Studies of the department concerned and approved by the Academic Council.
6. The examiner for evaluation should possess post graduate qualification and a minimum of three years teaching experience.
7. The appointment of examiners for evaluation of theory papers will be done by the Vice Chancellor on the basis of recommendation of Director of Evaluation / Controller of Examinations from a panel of examiners approved by the Academic Council.
8. The attendance marks (maximum 5) shall be allotted as follows :

Percentage of Attendance	Marks
76% to 80%	1
81% to 85%	2
86% to 90%	3
91% to 95%	4
96% to 100%	5

Program Code: SURCA200800
Bachelor of Computer Applications (BCA)I Semester

Subject Code	Subject	Hrs. per week		Scheme of Examination			C
		L	P	Duration	Sem End	Sessionals	
SURCA101	Fundamentals Information Technology	4	0	3 hrs	60	40	4
SURCA102	C Programming Language	4	0	3 hrs	60	40	4
SURCA 103	Mathematics-1	4	0	3 hrs	60	40	4
SURCA 104	Principles of Environmental Studies	4	0	3 hrs	60	40	4
SURCA 105	English Language Skills	4	0	3 hrs	60	40	4
SURCA 111	C Programming Lab	0	3	3 hrs	-	100	2
SURCA112	Office Automation Laboratory	0	3	3 hrs	-	100	2
Total Credits							24

Second Semester

Subject Code	Subject	Hrs. per week		Scheme of Examination			C
		L	P	Duration	Sem End	Sessionals	
SURCA201	Digital Logic Design	4	0	3 hrs	60	40	4
SURCA202	Object Oriented Programming in C++	4	0	3 hrs	60	40	4
SURCA203	Introduction to Unix Programming	4	0	3 hrs	60	40	4
SURCA204	Mathematics-II	4	0	3 hrs	60	40	4
SURCA205	Accountancy And Financial Management	4	0	3 hrs	60	40	4
SURCA211	Object Oriented Programming in C++ Lab	0	3	3 hrs	-	100	2
SURCA212	Unix Programming Lab	0	3	3 hrs	-	100	2
Total Credits							24

Third Semester

Subject Code	Subject	Hrs. per week		Scheme of Examination			C
		L	P	Duration	Sem End	Sessionals	
SURCA301	Computer System Architecture	4	0	3 hrs	60	40	4
SURCA302	Data Structures using C++	4	0	3 hrs	60	40	4
SURCA303	Web Technologies-I	4	0	3 hrs	60	40	4
SURCA304	Mathematics-III	4	0	3 hrs	60	40	4
SURCA305	Information Systems and Organizational Behaviour.	4	0	3 hrs	60	40	4
SURCA311	Data Structures Laboratory	0	3	3 hrs	-	100	2
SURCA312	Web Technologies-I Laboratory	0	3	3 hrs	-	100	2
Total Credits							24

Bachelor of Computer Applications (BCA) IV Semester

Subject Code	Subject	Hrs. per week		Scheme of Examination			C
		L	P	Duration	Sem End	Sessionals	
SURCA401	Data Base Management Systems	4	0	3 hrs	60	40	4
SURCA402	Operating Systems	4	0	3 hrs	60	40	4
SURCA403	Web Technologies-II	4	0	3 hrs	60	40	4
SURCA404	Management Information Systems	4	0	3 hrs	60	40	4
SURCA405	Data Communications	4	0	3 hrs	60	40	4
SURCA411	DBMS Lab	0	3	3 hrs	-	100	2
SURCA412	Web Technologies-II Lab	0	3	3 hrs	-	100	2
Total Credits							24

Fifth Semester

Subject Code	Subject	Hrs. per week		Scheme of Examination			C
		L	P	Duration	Sem End	Sessionals	
SURCA501	Principles of Programming Languages	4	0	3 hrs	60	40	4
SURCA502	Computer Networks	4	0	3 hrs	60	40	4
SURCA503	Web Technologies-III	4	0	3 hrs	60	40	4
SURCA504	Software Engineering	4	0	3 hrs	60	40	4
SURCA505	.NET Programming	4	0	3 hrs	60	40	4
SURCA511	Web Technologies-III Laboratory	0	3	3 hrs	-	100	2
SURCA512	.NET Laboratory	0	3	3 hrs	-	100	2
Total Credits							24

Sixth Semester

Subject Code	Subject	Hrs. per week		Scheme of Examination			C
		L	P	Duration	Sem End	Sessionals	
SURCA611	Project			12 weeks	50	50	12

Total Credits : 24 + 24+ 24+ 24+ 24+12 = 132

Bachelor of Computer Applications (BCA) I Semester

SURCA101: FUNDAMENTALS OF INFORMATION TECHNOLOGY

UNIT - I

Introduction: Characteristics of Computer, The Evolution of Computers, The Computer Generations.

Basic Computer Organization: Input Unit, Output Unit, Storage Unit, Arithmetic Logic Unit, Control Unit, Central Processing Unit, The System Concept.

UNIT - II

Secondary Storage Devices: Magnetic Tape, Magnetic Disk, Optical Disk. Magneto optical Disk, Mass Storage Devices and Other related Concepts.

Computer Software: Types of Software, Logical systems Architecture, Acquiring Software, Software developmental Steps, Software Engineering.

UNIT -III

Computer Languages: Machine Language, Assembly Language, High Level Language, Some High Level Languages, Characteristics of good Programming Language.

Operating Systems: What is an Operating System, Process Management, Some Popular Operating Systems.

UNIT – IV

Data Communications And Computer Networks: Basic Elements of a Communication System, Data Transmission Modes, Data Transmission Speed, Data Transmission Media, Digital and Analog Data Transmission,

UNIT - V

The Internet: Definition- Brief History, Basic Services, Internet Search Tools, WWW Browsers, Internet Search Engines, Uses of Internet, How to get Connected to Internet and Other related Concepts.

Classification Of Computers:

Notebook Computers, Personal Computers, Workstations, Main frame systems, Super Computers, Client-server Systems.

Text Books:

- Computer Fundamentals - Pradeep .K.Sinha : BPB Publications .

References:

- Computer Fundamentals- Rajaraman V.
- Introduction To Computers -Peter Norton
- Fundamentals Of Information technology Alexis Leon, Methew Leon, Vikas publications
- Internet – Margaret Levine Young – The Complete Reference – Millennium Edition – TMH Edition – 1999.
- Harley Hahn, The Internet – Complete Reference – Second Edition – TMH

Bachelor of Computer Applications (BCA) I Semester

SURCA102: C PROGRAMMING LANGUAGE

Unit - I

Introduction : Writing Algorithms – Top Down Design – Some Simple Examples For Writing Algorithms – Flowcharts, Structured Programming – Features Of C – Basic Input/Output – Single Character Input/Output – String Input/Output – General Input/Output – Format Specifies.

Variables And Expressions : Character Set – Identifiers And Keywords – Variables – Constants – Data Types – Data Type Conversions – Operators And Expressions.

Unit – II

Control Structures : Decision Making And Branching - If, If-Else, Nested If, Switch, Go To – Decision Making And Looping – For, While, Do-While.

Unit - III

Arrays And Strings : Accessing Array Elements – Initializing Of Array – Multidimensional Arrays – Strings – Arrays Of Strings – String Functions – Storage Classes.

Functions And Recursion : Introduction – User Defined And Library Functions – Function Declaration – Function Definition – Return Values – Recursion – Towers Of Hanoi.

Unit - IV

Pointers : Definition And Use Of Pointers - Address Operator – Pointer Variables – Dereferencing Pointers – Pointers To Pointers – Pointers And Arrays – Array Of Pointers – Pointers And Two Dimensional Arrays – Pointers And Character Strings.

Structures And Unions : Declaring And Using Structures – Structure Initialization – Structure Within Structure – Operations On Structures – Array Of Structures – Array Within Structure – Differences Between Structures And Unions.

Unit - V

File Management : Introduction – Defining And Opening File –Closing A File – Input/Output Operations On Files – Error Handling During I/O Operations – Random Access To Files – Command Line Arguments

Dynamic Memory Allocation : Library Functions For Dynamic Memory Allocation – Malloc(), Calloc(), Realloc().

Text Books :

- Mastering C – By K.R.Venugopal , S.R.Prasad , Tata Mcgraw Hill Publishers, New Delhi
- How To Solve It By Computer – By Dromey R.G, Prentice Hall Of India Ltd., New Delhi.

References:

- Programming Techniques Through C – By N.G.Venkatash Murthy, Pearson Education, New Delhi.
- Programming With C , Schuam's Outline Series – By Byron S.Goltfried Tata Mcgraw Hill Publishers, New Delhi.

Bachelor of Computer Applications (BCA) I Semester

SURCA103: MATHEMATICS-I

UNIT-I

Matrices: Matrix, Types of matrices, Addition, Subtraction, Multiplication of matrices, Determinants, Adjoint, Inverse of a matrix, Rank of a matrix, Matrix equation, Solution by Cramer's rule and Gauss elimination method, Eigen values and Eigen vectors of a matrix.

UNIT-II

Limits and Continuity: Limit at a point, Properties of limit, Computation of limits of various types of functions, Continuity at a point, Continuity over an interval, Intermediate value theorem, Type of discontinuities.

UNIT-III

Differentiation: Derivative, Derivates of Sum, Difference, Product and Quotients, Chain rule, Derivatives of Composite functions, Logarithmic differentiation, Maxima and Minima.

UNIT-IV

Integration: Integral as limit of sum, Riemann sum, Fundamental theorem of Calculus, Indefinite integrals, Methods of integration substitution, By parts partial fractions, Integration of algebraic and Transcendental functions, Reduction formulae for Trigonometric functions.

UNIT-V

Vector Algebra: Definition of a vector in two and three dimensions, Double and Triple scalar and vector product and their applications.

TEXT BOOKS:

1. Integral Calculus, Shanti Narayan, S.Chand & Co. 1999.
2. Differential Calculus, Shanti Narayan, S.Chand & Co. 1998.
3. Elementary Engineering Mathematics, Dr.B.S.Grewal, Khanna Publishers.

Bachelor of Computer Applications (BCA) I Semester

SURCA104: PRINCIPLES OF ENVIRONMENTAL STUDIES

Unit-I

The Multidisciplinary nature of environmental studies – Definition, Scope and Importance, need for Public awareness. **Natural Resources:** Renewable and Non-Renewable Resources. Natural Resources and Association Problems – Forecast Resources use and over exploitation, deforestation, care studies. Timber extraction, mining, dams and their effects on forest and tribal people. Water resources use and over utilization of surface and ground water, floods, drought, conflicts over water, dams- benefits and problems. Miner Resources : Use and exploitation, Environmental effects of extracting and using mineral resources, care studies. Food Resources: World Food Problems changes caused by agricultural and overgrazing, effects of modern agriculture, Fertilizer Pesticide problems, water logging, salinity, care studies. Energy Resources: Growing energy needs, renewable, non-renewable resources, use of alternative energy resources, care studies. Land as a Resource, Land degradation, Man induced land slides, Soil erosion and desertification. Role of an Individual in Conservation of natural resources. Equitable use of resources for sustainable life styles.

Unit II

Eco systems. Concept of an eco system. Structure and Function of an Eco System. Producers, consumers and decomposers, energy flow in the Eco System. Ecological succession. food chains, food webs and ecological pyramids. Introduction, types, characteristic feature, structure and function of the following eco systems: Forest eco systems, Grassland eco systems, desert eco system. Aquatic eco systems (Ponds, streams, lakes, rivers, oceans, estuaries)

Unit-III

Bio-diversity and its conservation – Introduction :Definition : genetic, species of eco system diversity. Biogeographical classification of India. Value of Bio-diversity: Consumptive use, productive use, social, ethical, aesthetic and option values. Bio-diversity and global national and local levels. India is a Mega diversity Nation. Hot spots of bio-diversity. Threats to bio-diversity: habitat space loss, poaching of wild life, Man wild life conflicts. Endangered and endemic species of India. Conservation of bio-diversity: In-situ and Ex-situ conservation of Bio-Diversity.

Unit-IV

Environmental pollution: Definition, causes, effects and control measures of Air Pollution, Water Pollution, Soil Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards. Solid waste management: causes, effects, and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies, Disaster Management: floods, earthquakes, cyclones and landslides.

Human Population and the Environment: Population growth, variation among nations, Population explosion-Family welfare programme. Environment and human health. Human rights, Value education, HIV/AIDS, Women and Child welfare, Role of information technology in environment and human health. Case

Unit-V

Social Issues and the Environment: From un-sustainable to sustainable development. Urban problems related to energy, Water conservation, rain water harvesting and watershed management. Re-settlement and rehabilitation of people, its problems and concerns. Care studies. Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Care studies. Wasteland reclamation. Consumerism and waste products. Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and Control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness. Studies.

Field Visit: Visit to local area to document environmental assets – river/forest/grassland/hill/mountain. Visit to a local polluted site – Urban/Rural/Industrial/Agricultural. Study of common plants, Insects, Birds. Study of simple ecosystems- pond, river, hill slopes, etc.

Text Book :

Text Book of Environmental studies for Undergraduate courses by Bharucha Erach
Published by V.G.C, New Delhi

Bachelor of Computer Applications (BCA) I Semester

SURCA 105: ENGLISH LANGUAGE SKILLS

The Fundamental aim of this course is to help the students to become a confident and competent communicator in written and spoken English. The methodology in teaching and evaluation shall be oriented towards this end, rather than rote memorization.

Prerequisite: Acquaintance with basis High School Grammar and composition.

Text Prescribed: Creative English for Communication, N.Krishna Swamy and T.Sriraman.

I) A Text with communicative approach

The aim of the text is to provide interesting new approach to learning English by providing stimulating and motivating material and a wide range of activities that are meaningful, natural, authentic, relevant and useful in day to day life “Creative English for communication: by N.Krishna Swamy and T.Sri Raman-Macmillan Publication 2005.

II) Section – I Communicate Unit-I, Unit-II, Unit-III, Unit-IV, and Unit-V and in Section-II Contemplate Unit-VII, Unit-VIII, Unit-IX, and Unit-XII only.

UNIT-I Textual lessons 1 & 2 (12 Hours)
Synonyms and Antonyms, one word substitutes, phrasal verbs.

UNIT-II Textual Lessons 3 & 4 (8 Hours)
Words often confused – pairs of words, Foreign Phrases.

UNIT-III Textual Lessons 5 & 6 (8 Hours)
Tense, Concord, Error analysis.

UNIT-IV Textual Lessons 7 & 8 (8Hours)
Paragraph writing, Dialogue writing, Essay Writing.

UNIT-V Textual Lessons 9 & 12 (8 Hours)
Reading Comprehension, Letter writing (Letter of Enquiry, Permission, Regret, Reconciliation, Complaint, Breaking the ice).

Supplementary Reading:

Current English for Colleges, N.Krishna Swamy and T.Sriraman. Macmillan
Examine your English, Margaret Maison Macmillan

Note: Figures in parentheses indicates number of approximate expected hours of instruction

.Bachelor of Computer Applications (BCA) I Semester

SURCA111: C PROGRAMMING LABORATORY

1. Program using arithmetic operators.
2. Program using logical operators.
3. Program using relational operators.
4. Program using bitwise operators.
5. Finding maximum of three numbers.
6. Sum of digits of a given number.
7. Swapping of two numbers.
8. Printing Fibonacci series up to 'n'.
9. GCD of two integers.
10. Reverse of a given number.
11. Roots of a quadratic equation
12. List of prime numbers below a given number
13. List of perfect numbers below a given number
14. Displaying multiplication table.

1-D Arrays:

15. Maximum and Minimum of an array.
16. Sorting an array.
17. Linear search.
18. Binary search.

2-D Arrays:

19. Sum of all elements in an array.
20. Matrix addition using functions.
21. Matrix multiplication using functions.
22. Matrix transpose using functions.

Recursion:

23. Factorial of a number using recursion.

Strings without using string functions:

24. Finding length of a string.
25. Reversing a string.
26. Checking for palindrome.

Pointers:

27. Sum of elements in an array using pointers.
28. Programs using call by value and call by reference.

Structures:

29. Finding 1st rank holder in a class using structures.

Book: E. Balaguswamy "Programming in C" TATA Mc.GRAW HILL

Y. Kanetkar, "Let us C", BPB Publications

Bachelor of Computer Applications (BCA) I Semester

SURCA112: OFFICE AUTOMATION LABORATORY

General Guidelines:

1. Relevant components of Microsoft Office should be used for this laboratory.
2. Students should be given material like simple text, brochures (containing text in different styles), a page from a mathematics text book (containing equations), etc., for learning WORD program.
3. The student should be encouraged to understand the spread sheet concept by providing him with useful live examples from the college.
4. The students should be given several small projects with live examples from the college and then make the students present the data using power point.
5. Basic principles of databases should be introduced to the student in a theory class and then the students should be encouraged (in groups) to develop an access a database (e.g. the college library student database, staff database, etc.).

MS-WORD:

Starting WORD – Creating new documents – Opening existing documents – Designing a document – Editing – Copying within a document and from one document to another – Moving – Saving – Quitting and restarting – Formatting – Headers, Footers and Footnotes – Tabs, Tables and Sorting – Typing symbols and special characters – Bulleted list – Spelling checker – Auto correct – Fonts – Macros – Mail merge.

MS-EXCEL:

Creating a new worksheet – Selecting cells – Mouse and keyboard navigation – Entering and editing text – Text boxes and text notes – Undoing and repeating actions – Entering and formatting numbers – Entering and editing formulas – Lookup tables – Rearranging worksheets – Formatting: changing column widths and row heights – Changing fonts and sizes – Alignment – Changing colors and shades – Inserting and removing page breaks.

MS-POWER POINT:

Access concepts and terms – Starting and quitting access – Workspace and tools – Views – Microsoft sample databases – Creating sample database with and without the wizard – Adding and deleting fields in tables – Renaming and rearranging – Deleting fields – Resizing fields – Primary key fields – Indexing fields – Forms – Form wizard – Saving and modifying forms – Form design – Entering and editing data – Finding, sorting and displaying data – Printing reports, forms, letters and labels.

REFERENCE:

Working with Microsoft Office – by Ron Mansfield (Tata McGraw-Hill)

Bachelor of Computer Applications (BCA) II Semester

SURCA201: DIGITAL LOGIC DESIGN

UNIT - I

BINARY SYSTEMS : Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes, Binary Storage and Registers, Binary logic.

UNIT - II

BOOLEAN ALGEBRA AND LOGIC GATES : Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean algebra, Boolean functions canonical and standard forms, other logic operations, Digital logic gates, integrated circuits.

UNIT - III

GATE – LEVEL MINIMIZATION : The map method, Four-variable map, Five-Variable map, product of sums simplification Don't-care conditions, NAND and NOR implementation other Two-level implementations, Exclusive – Or function,

UNIT - IV

COMBINATIONAL LOGIC : Combinational Circuits, Analysis procedure Design procedure, Binary Adder-Subtractor Decimal Adder, Binary multiplier, magnitude comparator, Decoders, Encoders, Multiplexers.

UNIT - V

SYNCHRONOUS SEQUENTIAL LOGIC : Sequential circuits, latches, Flip-Flops Analysis of clocked sequential circuits.
Registers, shift Registers, Ripple counters synchronous counters, other counters, HDL for Registers and counters.

Text books:

1. DIGITAL DESIGN – Third Edition , M.Morris Mano, Pearson Education/PHI.
2. FUNDAMENTALS OF LOGIC DESIGN, Roth,5th Edition, Thomson.

Bachelor of Computer Applications (BCA) II Semester

SURCA202: OBJECT ORIENTED PROGRAMMING IN C++

Unit - I

Principles of Object Oriented Programming: Software Evolution, Procedure oriented Vs Object Oriented Programming Paradigm, Basic Concepts of OOPs, Benefits of OOP, Features and Applications of OOP, Structure of C++ program.

Data Types, Operators and Expressions :

Character set, tokens, Keywords, Identifiers and Constants,, Data types and Sizes, Variables , Operators , Expression and their types, Implicit Conversion, Operator Overloading, Operator precedence , Control Structures.

Unit - II

Functions in C++: Function Prototype, Call by reference, Inline functions, Default Arguments, const Arguments, Function Overloading, friend and Virtual functions , Library Functions.

Classes and Objects : Class, access specifier, Accessing Class members, Defining Member functions, Memory Allocation for Objects, array of Objects, Static Data Members, Static Member Functions, Friend Functions, Constructor, Parameterized Constructor, Dynamic initialization of objects, Copy Constructor, Multiple Constructors in a class, Constructor with default arguments, Dynamic Constructors, Destructors.

Unit - III

Operator Overloading: Definition, Overloading Unary, Binary operators, Overloading Binary Operators using Friends, String Manipulation using operators

Unit - IV

Inheritance, Virtual Functions, Templates : Base class, derived class, Single, Multiple, Multi Level , Hierarchical , Hybrid Inheritance, Need for Virtual functions, Virtual base classes, Pure Virtual Functions, Virtual Destructors. Generic Classes, Function Templates, Class template.

Unit - V

I/O and Files : Streams and Stream Classes, Unformatted and Formatted I/O operations, Manipulators. File – Operations, Modes, Sequential and Random Access Files.

Exception Handling: Basics of Exception handling, Exception handling Mechanism, Throwing and Catching Mechanism.

Text book:

- Object Oriented Programming in C++ , E. Balaguruswamy, Third Edition, Tata McGraw Hill Publication.

Reference book :

- Mastering C++ , K.R.Venu Gopal , Tata McGraw Hill Publication.
- Object Oriented Programming in C++ , Bhawe , Patekar.

Bachelor of Computer Applications (BCA) II Semester

SURCA203: INTRODUCTION TO UNIX PROGRAMMING

UNIT – I

Introduction:

Operating System, OS Types, Salient Features of Unix, Various Unix, History of Unix, Unix System, Unix for Dos Users.

UNIT - II

File and Directory Structure:

Files, Type of Files, File Terminology, File Name Generation, File System, Directory, Path Name, Devices, Permission on Files and Directories.

Editors:

Stream Editor, Screen Editor, Line Editor,

UNIT – III

Unix Built In Commands:

File Manipulation commands, Directory Manipulation Commands, Text Processing Commands, Networking And Communication Commands, General Purpose Commands, Day to Day Commands, Help commands, Terminal and Screen Commands, Processes Commands, Listing the Files, File Name Generation Characters, Removing Files, Renaming Files, Copying Files, Join Files, Split Files, Compare Files and Return Differences etc, File Encryption, Directory Manipulation Commands, Creating Directories has advantages, Remove Directory names from pathnames, Text Processing Commands, Translate Characters, Splitting a file vertically, Merging line of file, Check Spelling, Grep Family, Sort Command, Networking and Communication, General Purpose Commands, Standard Operators, Day to Day commands,

UNIT – IV

AWK: Pre Defined statements in awk, Arrays,

Shell Programming: Overview, Command Line, Redirection, PIPES, TEE Command, Meta Characters, Quoting, Shell Variables, Sub Shells, Functions

UNIT – V

Unix Utilities and Shell Programming: Unix Utilities, Shell Script

Text Book:

Unix Concepts and Programming : Murugan Sethuraman

References:

Unix Concepts Sumithabha Das

Bachelor of Computer Applications (BCA) II Semester

SURCA204: MATHEMATICS-II (DISCRETE MATHEMATICS)

UNIT-I

Set Theory and Relations: Sets, Set operations, Algebra of Sets, Classes of sets, Power sets, Partitions, Relations, Representations of relations, Composition of relations, Types of relations, Partial ordering relations, n-ary relations.

UNIT-II

Functions and Counting: Functions, One-to-one, Onto and invertible functions, Mathematical, Exponential and Logarithmic functions, Basic counting principles, Permutations, Combinations, The pigeonhole principle, The inclusion-exclusion principle.

UNIT-III

Logic and Propositional Calculus: Propositions and truth tables, Tautologies, Logical equivalence, Algebra of propositions, Arguments, Logical implication, Propositional functions, Quantifiers.

UNIT-IV

Lattices and Boolean Algebra: Ordered sets, Hasse diagrams, Lattices, Distributed lattices and complimented lattices, Boolean algebra, Sum of products form for Boolean algebra.

UNIT-V

Graph Theory: Graphs and multigraphs, Subgraphs, Isomorphic graphs, Paths, Connectivity, Complete, Regular and Bipartite graphs, Tree graphs, Spanning trees, Kruskal algorithm, Planar graphs, Directed graphs, Warshall algorithm for path matrix and shortest-path matrix.

TEXT BOOKS:

1. Discrete Mathematics 2nd Edn. (Schaum's Outline Series), Seymour Lipschutz, Marc Lipson, Tata Mc-Graw Hill.
2. Discrete Mathematics and its applications, Kenneth H. Rosen, Tata Mc-Graw Hill.

Bachelor of Computer Applications (BCA) II Semester

SURCA205: ACCOUNTING AND FINANCIAL MANAGEMENT

Unit-I

Principles of Accounting

Principles of Double entry – Journalizing, Ledger – Posting and preparation of Trial Balance – Preparation of Trading Account, Profit and loss Account and Balance Sheet including Adjustments (Simple problems only), Bank Reconciliation Statement – Concepts, Conventions and Basic Accounting Assumptions.

Unit-II

Analysis Interpretation of Financial Statements

Ratio analysis – uses of ratios in interpreting the Final Accounts (Trading a/c–Profit and Loss A/c and Balance Sheet) – Final Accounts to as well as Ratios to Final Accounts Problems. (Simple problems only).

Unit-III

Break–even Analysis and Marginal Costing

Meaning of variable cost and fixed cost – Cost–Volume – Profit Analysis – Calculation of Break–even point, Profit Planning, Sales planning and other decision – making Analysis involving Break–even Analysis.

Unit-IV

Budget/Forecasting

Preparation of and Characteristics of functional Budgets – Production, Sales, Purchases, Cash and Flexible budgets, Zero Based Budgeting.

Unit-V

Project Appraisal

Method of Capital investment decision making: Pay back Method, ARR Method – Discounted Cash Flow – Methods including Net Present Value and IRR Method.

Text Book

R. L. Gupta and Radhaswamy, Advanced Accountancy, Volume One, Sultan Chand & Co., 2003.

Reference Books

1. **B. K. Bhar, Cost Accounting–Methods and Problems, Academic Publisher, 1995.**
2. S. N. Maheswari, Elements of Management Accountancy, Sultan Chand & Co., 3rd Edition, 1996.
3. P.C. Tulsan – Financial Accounting – Tata McGraw Hill Publication, New Delhi – First Edition, 2002.

Bachelor of Computer Applications (BCA) II Semester

SURCA211: . Object-oriented Programming Lab

1. Write a program to illustrate the Class Declarations, Definition and accessing Class members.
2. Write a program to implement a class student having the following members :

Data Members	Member Functions
Name of the student	To assign Initial Value
Marks of the Student	Compute Total and Average
	To Display the Data
3. Write a program to demonstrate Operator OverLoading.
4. Write a program to demonstrate Function OverLoading.
5. Write a program to demonstrate Friend Function and Friend Class.
6. Write a program to access members of a student class using pointer to object members.
7. Write a Program to demonstrate containership.
8. Write a Program to generate Fibonacci Series by Using Constructor to initialize the data members.
9. Write a program to demonstrate multiple Inheritance.
10. Write a program to invoking derived class member through base class pointer.
11. Write a template based program to sort the given list of elements.
12. Write a program to demonstrate the catching of all exceptions.
13. Write a program containing a possible exception. Use a try block to throw it and a catch block to handle it properly.
14. Write a program to demonstrate Dynamic Binding through Virtual Functions.
15. Write a program to perform insertion, deletion, updation of student records using sequential and random access files .

Bachelor of Computer Applications (BCA) II Semester

SURCA212: Unix Lab

1. Practice the commands encountered in the syllabus.
2. Write a shell script to compare two strings.
3. Write a shell script to find the length of the strings.
4. The marks obtained by a student in 5 different subjects are input through the keyboard. The student gets a rank as per the following rules:
Percentage above or equal to 60 – First Rank
Percentage above 50 and 59 – Second Rank
Percentage above 40 and 49 – Third Rank
Percentage less than 40 – Fail
5. Write a shell script to display file permissions along with their names.
6. Write a shell script to prints date, no of users and personal status.
7. Write a shell script which accepts a number and displays the list of even numbers from given number.
8. Write a shell sceipt that prints out date information in this order:
TIME, DAY OF WEEK, DAY NUMBER,MONTH, YEAR
Like 20:10:42 Mon 29 Jun 1970
9. Write a shell script to display the following details in a pay slip.
PAYSLIP DETAILS
 1. HOUSE RENT ALLOWANCE
 2. DEARNESS ALLOWANCE
 3. PROVIDENT FUND
10. Write a shell script to reverse the digit.

Bachelor of Computer Applications (BCA) III Semester

SURCA301: Computer Organization and Architecture

Unit-I

Register Transfer Language: Bus and memory transfers, Arithmetic logic micro operations, shift micro operations.

Unit-II

Basic Computer Organization and Design: Machine language, Assembly language, Assembler, Program loops, Programming arithmetic and logic operations, subroutines, Input-output programming.

Unit-III

Central processing unit: Register organization, stack organization, instruction format and addressing modes.

Unit-IV

Input-Output Organization: Strobe based and handshake base communication, vector and priority interrupt, DMA based data transfer.

Unit-V

Memory Organization: Basic cell of static and dynamic RAM, building large memories using chips, associative memory, Cache memory, Virtual memory.

Text books:

1. Computer organization and architecture by M. Morris mano
2. Computer organization and architecture by William Stallings.

Bachelor of Computer Applications (BCA) III Semester

SURCA302: DATA STRUCTURES USING C++

Unit-I

Introduction to Data Structures : Abstract Data Types, Arrays, multi-dimensional arrays, structures and pointers concepts in C++.

Stack : Specification of ADT and primitive operators, Representing, Stacks , Applications of Stacks: Infix, Postfix and prefix expression handling.

Unit-II

Queues and Lists: The queues and its Sequential Representation, Linked lists, Lists in C++, Circular Linked lists, Doubly linked lists

Unit-III

Trees: Introduction, Multiway Trees, Binary Trees, Binary Tree implementation using Arrays, Implementing Multiway Tree.

Unit-IV

Graphs: Introduction, Basic Concepts, Graph Representation, Transitive Closure, Warshall's Algorithm, Shortest Paths, Graph Algorithms.

Unit-V

Sorting: General Background, Exchange Sorts, Selection and Insertion Sorts, Merge, Quick sort, Linear search and binary search.

Text Book:

1. Data Structures in 'C++' by N.S.Kutti & P.Y.Padhye
2. Data Structures through 'C++' by Yaswanth Kanitkar.

Reference Books:

1. Data Structures Using 'C++' by Allen Weiss, Pearson Educatio

Bachelor of Computer Applications (BCA) III Semester

SURCA303: Web Technologies-I

Unit-I

INTERNET BASICS- Basic Concepts – Communicating on the Internet – Internet Domains – Internet Server Identities Establishing Connectivity on the Internet Client IP address How IP Addressing Came into Existence? - A Brief Overview of TCP/IP and its services Internet Protocol – Transmission Control Protocol – The World Wide Web – The Net – Self Review Questions.

INTRODUCTION TO HTML-Information files creation – Web Server – Web Client/Browser –, Hyper Text Markup Language (HTML) – Commonly used HTML Commands Titles and footers text formatting – Emphasizing Material in a web page – Text styles – Other text affects – Spacing (Identity Text) – Self Review Questions – Hands on Exercise

Unit-II

LISTS- Types of lists – Self Review questions – Hands on exercise

ADDING GRAPHICS TO HTML DOCUMENTS- Using the BORDER Attribute – Using the CELLPADDING Attribute – Using the CELLSPACING Attribute – using BGCOLOR Attribute - Using COLSPAN And ROWSPAN Attributes Self Review Questions – Hands on Exercise.

Unit-III

LINKING DOCUMENTS - Links – Images as Hyperlinks – Self Review Questions – Hands on Exercise

FRAMES- INTRODUCTION TO FRAMES – Self Review Questions – Hands on Exercise

Unit-IV

INTRODUCTION TO JAVASCRIPT- JavaScript in web pages – The Advantages of JavaScript – Writing JavaScript into HTML - Building up JavaScript Syntax – Basic Programming Techniques – Operators and Expressions in JavaScript – JavaScript Programming Constructs – Conditional Checking – Super controlled endless loops – Functions in JavaScript – Placing text in a Browser – Dialog Boxes – Self Review Questions – Hands on Exercise.

THE JAVASCRIPT DOCUMENT OBJECT MODEL- Introduction – The JavaScript assisted style sheets DOM (JSSS DOM), Understanding Objects In HTML – Browser Objects - Handling (Web page) Events Using JavaScript – Self Review Questions – Hands on Exercise.

Unit-V

FORMS USED BY A WEB SITE- The form Object – Other Built – in objects in Javascript – User defined Objects – Self Review Questions - Hands on Exercise.

COOKIES - What are Cookies – Setting a Cookie - Self Review Questions.

DYNAMIC HTML- Cascading Style Sheets – Class – Using the ... TAG – External Style Sheets – Working with Javascript style sheets Using the <DIV> ... </DIV>TAG – To move forward – Self Review Questions – Hands on Exercise.

Text book: HTML, DHTML, JavaScript, Perl CGI IVAN BAYROSS

Bachelor of Computer Applications (BCA) III Semester

SURCA304: MATHEMATICS-III (NUMERICAL METHODS AND STATISTICS)

UNIT-I

Interpolation: Operations, Forward and Backward difference operations and their interrelation, Interpolation formulae: Newton's forward, Backward and Divided difference formulae, Lagrange's formula.

UNIT-II

Solution of Non-linear Equations: Bisection method, False position method, Newton-Raphson method for solving equation involving variable only.

Solution of Linear Simultaneous Equations: Gaussian elimination method with and without row interchange, LU Decomposition: Gauss-Jacobi and Gauss-Seidel methods, Gauss-Jordan method and to find inverse of a matrix by this method.

UNIT-III

Numerical Differentiation: First and Second order derivatives at tabular and non-tabular points.

Numerical Integration: Trapezoidal rule, Simpson's 1/3 rule, Error in each formula (without proof).

UNIT-IV

Statistics: Measures of Central tendency, Dispersion, Correlation, Rank correlation, Regression.

UNIT-V

Probability: Definition of probability, Addition theorem, Conditional probability, Multiplication theorem, Independent events, Bayes theorem, Random variables, Continuous and discrete random variables.

TEXT BOOKS:

1. Numerical Methods, E.Balaguruswamy, Tata Mc-Graw Hill.
2. Numerical Analysis, S.S.Sastry, Prentice Hall of India.
3. Statistical Methods, S.P.Gupta
4. Fundamentals of Mathematical Statistics, S.C.Gupta and V.K.Kapoor.

Bachelor of Computer Applications (BCA) III Semester

SURCA305: INFORMATION SYSTEMS & ORGANIZATIONAL BEHAVIOUR

Unit-I

Organizational Structure and Design – Managerial Communication and its barriers – Controlling – Delegation of Authority and Inter Departmental Co-ordination.

Unit-II

Organizational Climate and Culture – Management of Organizational Conflicts –Theories of Motivation.

Unit –III

Group Dynamics – Characteristics of a Leader – Leadership Styles – Analysis of Interpersonal Relations.

Unit-IV

MIS Perspective – Information needs and its objectives – Management Information and Control Systems.

Unit-V

Information for Decision Making – Conceptual Foundations of Information Systems – Information Resource Management.

Text Books:

1. Elements of organizational Behavior, Robbins, 7th Edition, Pearson Education
2. Information Systems, Alter, Pearson Education
3. Organization and Management - R. D. Agarwal
4. Organization theory and Behaviour - L.M.Prasad
5. Practice and Management - Peter F. Drucker
6. Management Information Systems – Kanter Jerma
7. Computer and Information Management – S.C.Bhatnagar and K.V.Rama Devi

Bachelor of Computer Applications (BCA) III Semester

SURCA311: DATA STRUCTURES LAB

1. Program to perform stack operations.
2. Program to perform queue operations
3. Program to perform Circular queue operations
4. Program to perform Linked list operations include insertion, deletion modification, reverse.
5. Program to perform linked stack operations.
6. Program to perform linked queue operations.
7. Program to perform linked circular queue operations.
8. Program to perform tree operations include creation insertion, deletion modification operation
9. Program to perform Binary tree Creation and its non recursive traversals
10. Program to perform linear search
11. Program to perform Binary Search
12. Program to perform Bubble Sort
13. Program to perform Insertion Sort
14. Program to perform selection Sort
15. Program to perform quick sort.

Bachelor of Computer Applications (BCA) III Semester

SURCA312: WEB TECHNOLOGIES-I LAB

1. Write an HTML document to display the word "WEBDESIGNING" in horizontal Scrolling format.
2. HTML document to demonstrate Ordered lists, unordered Lists, definition Lists.
3. Write an HTML document to create use tables.
4. Write an HTML document to create table header rows, data rows.
5. Write an HTML document to create caption and attributes of the table tag.
6. Write an HTML document to cell padding and cell spacing
7. Write an HTML document to create BG colour colspan and Row span attribute
8. Write an HTML document to frames
9. Write an HTML document to frameset and the targeting named frames
10. Program to perform validations using JavaScript
11. Program to perform validations using JavaScript
12. Program to perform validations using JavaScriptp
13. Program to perform validations using JavaScript
14. Program to perform validations using JavaScript
15. Program to develop DHTML document Cascading Style sheets
16. Program to develop DHTML document Using Background, Text and Border related Attributes
17. Program to develop DHTML document External Style Sheets
18. Program to develop DHTML document JavaScript Assisted Style Sheets
19. Program to develop DHTML document using and <DIV> tags
20. Program to develop DHTML document Layers and its features

Bachelor of Computer Applications (BCA) IV Semester

SURCA401: DATABASE MANAGEMENT SYSTEMS

UNIT-I

Introduction: Database-Systems Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Database Design, Object-based and Semi structured Databases, Data Storage and Querying, Transaction Management, Data Mining and Analysis, Database Architecture, Database Users and Administrators, History of database Systems.

UNIT - II

Relational Model: Structure of Relational Databases, Fundamental Relational-Algebra Operations, Additional Relational Algebra operations, Extended Relational Algebra operations, Null Values, Modification of the Database.

UNIT-III

SQL : Data Definition, Basic Structure of SQL Queries, Set Operations, Aggregate Functions, Null Values, Nested Sub queries, Complex Queries, Views, Modification of the Database, Joined Relations.

UNIT-1V

Database Design and E-R Model: Entity-Relationship Model, Constraints, Entity-Relationship Diagrams, Entity-Relationship Design Issues, Weak Entity Sets, Extended E-R Features, Database Design for Banking Enterprise, Reduction to Relational Schemas, UML.

UNIT-V

Relational Database Design: Features of Good Relational Design, Atomic Domains and First Normal Form, Decomposition using Functional Dependencies, Functional-Dependency Theory, Decomposition Using Functional Dependencies, Decomposition Using Multivalued Dependencies, more Normal Forms, Database-design Process, and Modeling Temporal Data.

Text Book:-

Database System Concepts by Henry F.Korth, S.Sundarshan

Bachelor of Computer Applications (BCA) IV Semester

SURCA402: OPERATING SYSTEMS

UNIT-I

Introduction to Operating Systems: What is an operating system? Mainframe systems, Desktop systems, Multiprocessor systems, Distributed systems, Clustered systems, Real-time systems, Handheld systems, Feature migration, Computing environments.

Operating System Structures: System components, Operating system services, System calls, System programs, System structure, Virtual machines, System design and implementation, System generation.

UNIT-II

Processes: Process concept, Process scheduling, Operations on processes, Cooperating processes, Interprocess communication, Communication in client-server systems.

CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling algorithms, Multiple-processor scheduling, Real-time scheduling, Algorithm evaluation, Process scheduling models.

UNIT-III

Process synchronization: Background, The Critical-section problem, Synchronization hardware, Semaphores, Classic problems of synchronization, Critical regions, Monitors.

Deadlocks: System model, Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock.

UNIT-IV

Memory management: Background, Swapping, Contiguous memory allocation, Paging, Segmentation, Segmentation with paging.

UNIT-V

Virtual memory: Background, Demand paging, Process creation, Page replacement, Allocation of frames, Thrashing, Operating system examples, Other considerations.

TEXT BOOK:

Operating System Concepts, Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, John Wiley & Sons, Inc.

REFERENCES:

1. Operating Systems, Achyut S. Godbole, Tata McGraw-Hill.

Bachelor of Computer Applications (BCA) IV Semester

SURCA403: Web technologies -II

Unit – I

The Primaries and Control Statements - Introduction to Java – Features of Java – Object Oriented Concepts – Lexical Issues – Data Types – Variables – Arrays Operators – Control Statements.

Unit - II

Classes and Objects - Classes – Objects – Constructors – Overloading method as Control – Static and fixed methods – Inner Classes – String Class – Inheritance – Overriding methods – Using super-Abstract class.

Unit – III

Packages and Threads - Packages – Access Protection – Importing Packages – Interfaces – Exception Handling – Throw and Throws – Thread – Synchronization – Messaging – Runnable Interface – Inter thread Communication – Deadlock – Suspending, Resuming and stopping threads – Multithreading.

Unit – IV

Applets and Event Handling - Applet Basics , Applet Architecture , Applet Skeleton ,Simple Applet display methods , Requesting Repainting – Simple Banner Applet , HTML Applet Tag – Event Handling – Two Event Handling Mechanisms , Event Classes , Event Listener Interfaces , Adapter Classes

Unit – V

Swings - JApplet , Icons and Labels, Text Fields , Buttons , Combo Boxes , Tabbed Panes , Scrolled Panes , Trees, Tables.

Text Book

R. Naughton and H. Schildt – Java2 (The Complete Reference) – Fifth Edition – TMH – 2004.

Reference Books

1. K. Arnold and J. Gosling – The Java Programming Language – 3rd Edition., Pearson Edu, 2005
2. David Flanagan – Java in a Nutshell: A Desktop Quick Reference for Java Programmers – O'Reilly & Associates, Inc. 1999
3. Bruce Eckel –Thinking in Java – Prentice Hall, 2nd Ed 2002.

Bachelor of Computer Applications (BCA) IV Semester

SURCA404: MANAGEMENT INFORMATION SYSTEMS

UNIT – I

The meaning and role of MIS: What is MIS?. Decision support systems, systems approach, the systems view of business, MIS Organization within the company.

UNIT – II

Information Systems for decision making: Evolution of an information system, Basic Information Systems, decision making and MIS, MIS as a technique for making programmed decisions, decision assisting information systems.

Strategic and project planning for MIS: General business planning, appropriate MIS response, MIS planning – general, MIS planning – details.

UNIT – III

Conceptual system design: Define the problems, set system objectives, establish system constraints, determine information needs, determine information sources, develop alternative conceptual designs and select one, document the system concept, prepare the conceptual design report.

UNIT – IV

Implementation, evaluation and maintenance of the MIS: Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train and operating personnel, computer related acquisitions, develop forms for data collection and information, dissemination, develop the files, test the system, cut over, document the system, evaluate the MIS, control and maintain the system.

UNIT-V

Pitfalls in MIS development: Fundamental weaknesses, soft spots in planning, design problems, implementation: The TAR PIT.

Text book:

1. R. G. Murdick, J. E. Ross and J. R. Clagget, "Information Systems for Modern Management", 3rd Edition by, PHI – 1994.
2. Parker, Charles Case, Thomas, "Management Information System: Strategy & Action", 2nd Edition, TMH, 1993.
3. Brein James.O-Management Information Systems

Bachelor of Computer Applications (BCA) IV Semester

SURCA405: DATA COMMUNICATIONS

UNIT-I

BASIC CONCEPTS: Data Communication Line Configuration – Point-to-Point, Multipoint – Topology – Mesh, Star, Tree, Bus, Ring, Hybrid topologies – Transmission Mode – simplex, Half-Duplex, Full-Duplex – Categories of Networks – LAN, MAN, WAN – Inter Networks.

THE OSI LAYER: The Model – Layered structure – Functions of the Layers – Physical layer, Data Link layer, Network Layer, Transport Layer, Session Layer, Presentation Layer, Application Layer
TCP/IP Protocol suite

UNIT-II

TRANSMISSION OF DIGITAL DATA: INTERFACES AND MODEMS: Digital Data Transmission – Parallel Transmission, Serial Transmission – DTE-DCE Interface – Data Terminal Equipment(DCE), Data Circuit-Terminating Equipment(DCE).

MULTIPLEXING: Frequency-Division Multiplexing(FDM) – wave Division Multiplexing(WDM) – Time Division Multiplexing(TDM) – Inverse Multiplexing – Multiplexing Application. (Chapter 2, 3, 6 & 8)

UNIT – III

ERROR DETECTION AND CORRECTION: Types of Errors – Single-Bit Error, Burst Error – Detection – Redundancy – Vertical Redundancy check (VRC) – Longitudinal Redundancy Check(LRC) – Cyclic Redundancy Check(CRC) – Checksum – Error Correction – Single-Bit Error Correction, Hamming Code, Burst Error Correction.

DATA LINK CONTROL: Line Discipline – ENQ/ACK, Poll/Select – Flow Control – Stop-and-wait, Sliding Window – Error Control - Automatic Repeat Request (ARQ), Stop-and-wait ARQ, Sliding window ARQ.

UNIT-IV

LOCAL AREA NETWORK: Protocol Data Unit(PDU)– Ethernet – Access Method: CSMA/CD, Addressing, Electrical Specification, Frame Format, Implementation - Other Ethernet Networks – Switched Ethernet, fast Ethernet, Gigabit Ethernet– Token Bus – Token Ring - Access Method: Token Passing, Addressing, Electrical Specification, Frame Format, Implementation – FDDI - Access Method: Token Passing, Addressing, Electrical Specification, Frame Format, Implementation: Physical Medium Dependent(PMD) Layer.

UNIT - V

SWITCHING: Circuit Switching – Space-Division Switches, Time-Division Switches, TDM Bus, Space and time-division Switching Combinations, Public Switch Telephone Network(PSTN) – Packet Switching – Datagram Approach, Virtual Circuit Approach, Circuit-Switched Connection versus Virtual Circuit Connection – Message Switching.
(Chapter 9, 10, 12 and 14)

Text Book:

1. Data Communications and Networking, Behrouz A. Forouzan, Tata Mcgraw- Hill Publishing Co
2. Computer Networks- A.S.Tanenbaum, Pearson. Education.

Bachelor of Computer Applications (BCA) IV Semester

SURCA411: DBMS LAB

1. Understand the fundamentals of a relational database
2. Understand the fundamentals of client-server applications
3. Understand the use of Structured Query Language (SQL)
4. Data definition language
5. Data manipulation language
6. Data control language
7. Understand and write SQL /PL_SQL queries to create, report, and update data in a relational database
8. Understand the purpose of and be able to create views, scripts, triggers, and Transactions

1. Introduction to Relational Databases and SQL Programming, Christopher Allen, Simon Chatwin, Catherine A. Vreary Tata McGraw-Hill
2. Oracle SQL and PL/SQL Hand book, John Adolph Palinski, Pearson Education
3. Oracle 9i PL/SQL Programming, Scott Urman, Tata McGraw-Hill

Bachelor of Computer Applications (BCA) IV Semester

SURCA412: WEB TECHNOLOGIES II LAB

1. Program to demonstrate various data types
2. Program to demonstrate various variables
3. Program to demonstrate various arrays
4. Program to demonstrate various arithmetic operators
5. Program to demonstrate Bit wise operators
6. Program to demonstrate relational operators
7. Program to demonstrate various control structures or control statements.
8. Program to demonstrate classes and objects
9. Program to demonstrate constructors and different number of parameters passed to constructors.
10. Program to demonstrate overloading methods.
11. Program to demonstrate overloading constructors
12. Program to demonstrate call by value and call by reference
13. Program to demonstrate static variable and static class
14. Program to demonstrate single inheritance
15. Program to demonstrate super
16. Program to demonstrate multilevel inheritance
17. Program to demonstrate method overriding
18. Program to demonstrate dynamic method dispatch
19. Program to demonstrate Abstract Classes
20. Program to demonstrate packages
21. Program to demonstrate Interfaces
22. Program to demonstrate exception handling
23. Program to demonstrate Multiple catch clauses
24. Program to demonstrate Throw, throws, finally
25. Program to demonstrate Creative multiple threads
26. Program to demonstrate different control on applets

Bachelor of Computer Applications (BCA) V Semester

SURCA501: PRINCIPLES OF PROGRAMMING LANGUAGE

UNIT-I

Introduction:

Preliminaries-Language Evaluation Criteria, Evolution of the Major Programming Languages

Describing Syntax and Semantics: Formal methods of describing syntax, Attribute grammars, Describing meaning of programs: Dynamic semantics

UNIT-II

Names, Binding, Type Checking, Data Types, Subprograms and Scopes: The concept of binding, type compatibility, scope, scope and life time, pointers types, parameter passing methods.

UNIT-III

Object Oriented Programming: Object, Object oriented thinking, inheritance, object oriented programming in C++, and an extended c++ example, derived classes and information hiding, objects in Smalltalk.

UNIT-IV

Functional Programming: A Little language of expression, types: values and operations, functional declarations approaches to expression evaluation lexical scope, type checking, implicit types, data types, exceptional handling, in ML, scheme a dialect of lisp, the structure of lists, list manipulation simplification of expressions storage allocation for lists.

UNIT-V

Logic Programming Languages: Introduction, A brief introduction for Predicate Calculus, Predicate Calculus and Proving Theorems, An Overview of Logic Programming, The Origins of Prolog, the basic elements of Prolog, Deficiencies of Prolog, Applications of Logic Programming, Conclusions.

Text Book:

Concepts of Programming Languages, Robert W. Sabesta Pearson Education.

References:

1. Programming Languages – Concepts & Constructors, Ravi Sethi, Pearson Education
2. Programming Languages – Design & Implementation, Terrance W. Pratt, Marvin V. Zelkowitz, Pearson Education

Bachelor of Computer Applications (BCA) V Semester

SURCA502: COMPUTER NETWORKS

UNIT-I

NETWORKING AND INTERNETWORKING DEVICES: Repeaters – Not an Amplifier –Bridges- Types of Bridges, Bridges Connecting Different LANs – Routers – Routing concepts – Gateways – Other Devices – Multiprotocol Routers, Brouters, switches, Routing Switches – Routing algorithms – Distance Vector Routing - Sharing Information, Routing Table – Link State Routing –Information Sharing, The Dijkstra Algorithm. (Chapter 16, 17 and 21)

UNIT-II

TRANSPORT LAYER: Duties of Transport Layer – End-to-End Delivery, Addressing, Reliable Delivery, Flow control, Multiplexing – Connection – Connection Establishment, connection Termination – The OSI Transport Protocol – Transport Classes, Transport Protocol Data Unit(TPDU), Connection-oriented and Connectionless services.

UNIT-III

UPPER OSI LAYERS: Session layer – Session transport Interaction, Synchronization points, Session Protocol Data Unit - Presentation Layer – Translation, Encryption/decryption, Authentication, Data Compression – Application Layer – Message Handling System(MHS), File transfer, Access and Management(FTAM), Virtual Terminal(VT), Directory Services(DS), Common Management Information Protocol(CMIP).

UNIT-IV

TCP/IP PROTOCOL SUITE: Overview of TCP/IP – TCP/IP and the Internet, TCP/Ip and OSI, Encapsulation – Network Layer – Internetwork Protocol(IP) – Addressing – classes, Dotted decimal Notation, Nodes with More Than One Address, A Sample Internet – Subnetting – Three Levels of Hierarchy, Masking, Finding The Subnetwork Address.

UNIT-V

Other Protocols In the Network Layer – Address Resolution Protocol(ARP), Reverse Address Resolution Protocol(RARP),Internet Control Message Protocol(ICMP), Internet Group Message Protocol(IGMP) – Transport Layer – User datagram Protocol(UDP), Transmission Control Protocol(TCP). (Chapter 22, 23 and 24)

ISDN – Integrated Digital Networks (IDN), Integrated Service Digital Network (ISDN), Subscriber Access to the ISDN – B,D,H,Channels, User Interfaces, Functional Grouping, Reference Points.

Text Book:

1. Data Communications and Networking, Behrouz A. Forouzan, 3rd Edition, Tata Mcgraw- Hill Publishing Co
27. Computer Networks- A.S.Tanenbaum, Pearson. Education.

Bachelor of Computer Applications (BCA) V Semester

SURCA503: Web Technologies –III

Unit-I

JDBC: What is jdbc, jdbc API, Understanding jdbc architecture, jdbc types, different operations using jdbc connectivity, Prepared statement, Callable statement.

Java Servlet Technology: What is a Servlet?, The Example Servlets, Servlet Life Cycle, Sharing Information, Initializing a Servlet, Writing Service Methods, Filtering Requests and Responses, Invoking Other web Resources, Accessing the Web Context Maintaining Client State, Finalizing a Servlet, Further Information.

Unit-II

Java server Pages Technology: What is a JSP Page? The Example JSP Pages, The Life Cycle of a JSP Page, Creating Static Content, Creating Dynamic Content, Expression Language, Java Beans Components, Using Custom Tags, Reusing Content in JSP Pages, Transferring Control to Another Web Component, Including an Applet, Setting Properties for Groups of JSP Pages, Further Information.

Unit-III

Javasever Pages Documents: The Example JSP Document, Creating a JSP Document, Identify the JSP Document to the Container

Javasever pages standard Tag Library: Using JSTL, Core Tag Library, XML Tag Library, Internationalization Tag Library, SQL Tag Libr5ary

Unit-V

Custom Tags in JSP Pages: What is a Custom Tag? Types of Tags, Encapsulating Reusable Content Using Tag Files, Tag Library Descriptors, Programming Simple Tag Handlers

Scripting in JSP Pages: Using Scripting, Disabling Scripting, Declarations, Script lets, Expressions, Programming Tags That Accept Scripting Elements

Textbook:

1. The J2EE™ Tutorial Second Edition Stephanie Bodoff, Eric Jendrock

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SURCA504: SOFTWARE ENGINEERING

Unit-I

Introduction :The Problem Domain , Industrial Strength Software , Software is Expensive , Late and Unreliable , Maintenance and Rework , The Software Engineering Challenges , Scale , Quality and Productivity , Consistency and Repeatability , Change The Software Engineering Approach , Phased Development Process , Managing the Process

Unit-II

Software Processes

Software Process , Processes and Process Models , Component Software Processes ETVX Approach for Process Specification , Desired Characteristics of Software Process Predictability , Support Testability and Maintainability , Support Change , Early Defect Removal , Process Improvement and Feedback , Software Development Process Models , Waterfall Model , Prototyping , Iterative Development , Time boxing Model , Comparison of Models , Other Software Processes , Project Management Process , The Inspection Process , Software Configuration Management Process , Requirements Change Management Process , Process Management Process

Unit-III

Software Requirements Analysis and Specification - Software Requirements , Need for SRS , Requirement Process , Problem Analysis Informal Approach , Data Flow Modeling , Object-Oriented Modeling , Prototyping , Requirements Specification , Characteristics of an SRS , Components of an SRS , Specification Language , Structure of a Requirements Document , Functional Specification with Use Cases , Basics , Examples , Extensions , Developing Use Cases , Validation , Metrics , Size—Function Points , Quality Metrics

Planning a Software Project - Process Planning , Effort Estimation , Uncertainties in Effort Estimation , Building Effort Estimation Models , A Bottom-Up Estimation Approach , COCOMO Model , Project Scheduling and Staffing , Overall Scheduling , Detailed Scheduling , Team Structure , Software Configuration Management Plan , Quality Plan , Defect Injection and Removal Cycle , Approaches to Quality Management , Quality Plan , Risk Management , Risk Management Concepts , Risk Assessment , Risk Control , A Practical Risk Management Approach , Project Monitoring Plan , Measurements , Project Monitoring and Tracking .

Unit-IV

Function-Oriented Design - Design Principles , Problem Partitioning and Hierarchy , Abstraction , Modularity , Top-Down and Bottom-Up Strategies , Module-Level Concepts , Coupling , Cohesion Design Notation and Specification , Structure Charts , Specification . Structured Design Methodology , Restate the Problem as a Data Flow Diagram , Identify the Most Abstract Input and Output Data Elements , First-Level Factoring , Factoring the Input, Output, and Transform Branches, Design Heuristics , Transaction Analysis , Discussion , Verification, Metrics , Network Metrics , Stability Metrics , Information Flow Metrics

Detailed Design - Detailed Design and PDL , PDL , Logic/Algorithm Design , State Modeling of Classes , Verification , Design Walkthroughs , Critical Design Review , Consistency Checkers , Metrics , Cyclomatic Complexity , Data Bindings , Cohesion Metric .

Unit-V

Testing - Testing Fundamentals , Error, Fault, and Failure , Test Oracles , Test Cases and Test Criteria , Psychology of Testing , Black-Box Testing , Equivalence Class Partitioning , Boundary Value Analysis , Cause-Effect Graph , Special Cases , State-Based Testing , White-Box Testing , Control Flow-Based Criteria , Data Flow-Based Testing , Mutation Testing , Test Case Generation and Tool Support , Testing Process , Levels of Testing , Test Plan , Test Case Specifications , Test Case Execution and Analysis , Defect Logging and Tracking , Defect Analysis and Prevention , Pareto Analysis , Perform Causal Analysis , Develop and Implement Solutions , Metrics—Reliability Estimation , Basic Concepts and Definitions , A Reliability Model , Failure Data and Parameter Estimation , Translating to Calendar Time.

Text Book:- An Integrated Software Engineering by Pankaj Jalote

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SURCA505: .NET PROGRAMMING

UNIT – I

Fundamentals of Visual Basic, Exception handling, windows forms, Control Classes, Different Types of Boxes, Labels, Buttons, Panels. (Chapters 1 to 7)

UNIT – II

WINDOWS FORMS: Different types of Bars, Menus, and Views.

UNIT – III

OBJECT - ORIENTED PROGRAMMING: Classes and objects constructors and destructors, inheritance, modifiers, Interfaces, Polymorphism, Late Binding, Graphics handling and File handling. (Chapters 8 to 13)

UNIT - IV

WEB FORMS: Working with web forms, Web forms and HTML, The Web control class, Web Forms and Boxes, Web Forms and Buttons, Validation Controls, Ad Rotators, Web Forms and HTML controls. (Chapters 14 to 19)

UNIT - V

DATA ACCESS WITH ADO.NET: Accessing data with the server explorer, Data adapters and Data sets, Binding Controls to databases, Handling databases in code, Database access in Web Applications. Creating user Controls, Web user Controls, and Multithreading creating Windows services, Web Services and Deploying applications. (Chapters 20 to 25)

TEXT BOOK :

1. VB.NET PROGRAMMING (BLACK BOOK) BY STEVEN HOLZNER (Dreamtech - 2003)

REFERENCE BOOKS:

1. VB.NET PROGRAMMING BY T. GADDIS (Dreamtech)
2. Microsoft Visual Basic. Net step by step By Halvorsen (PHI)
3. OOP with Microsoft Visual Basic.Net By Reynold Hacrtte (PHI)

Bachelor of Computer Applications (BCA) V Semester

SURCA511: WEB TECHNOLOGIES III LAB

Programs using JDBC Web pages development using servlets and JSP

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SURCA512: .NET PROGRAMMING LAB

The concepts covered in the corresponding theory are to be implemented

TEXT BOOK :

1. VB.NET PROGRAMMING (BLACK BOOK) BY STEVEN HOLZNER (Dreamtech - 2003)

REFERENCE BOOKS:

1. VB.NET PROGRAMMING BY T. GADDIS (Dreamtech)
2. Microsoft Visual Basic. Net step by step By Halvorsen (PHI)
3. OOP with Microsoft Visual Basic.Net By Reynold Hactte (PHI)

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SURCA611 : _Project