B.C.A..Part-I,II & III
(Sem-I to VI)

Prospectus No. 20131221

संत गाडगे बाबा अमरावती विद्यापीठ
SANT GADGE BABA AMRAVATI UNIVERSITY

विज्ञान विद्याशाखा
(FACULTY OF SCIENCE)

PROSPECTUS
OF
B.C.A.PART-I, II & III (SEMESTER-I to VI)
SEMESTER-I, III & V EXAM. WINTER-2012 &
SEMESTER-II, IV & VI EXAM. SUMMER-2013 &
ONWARDS

2012

Price Rs. ...../-

Published by
Dineshkumar Joshi
Registrar,
Sant Gadge Baba
Amravati University
Amravati - 444 602

I N D E X

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SANT GADGE BABA AMRAVATI UNIVERSITY

SPECIAL NOTE FOR INFORMATION OF THE STUDENTS

(1) Notwithstanding anything to the contrary, it is notified for general information and guidance of all concerned that a person, who has passed the qualifying examination and is eligible for admission only to the corresponding next higher examination as an ex-student or an external candidate, shall be examined in accordance with the syllabus of such next higher examination in force at the time of such examination in such subjects, papers or combination of papers in which students from University Departments or Colleges are to be examined by the University.

(2) Be it known to all the students desirous to take examination/s for which this prospectus has been prescribed should, if found necessary for any other information regarding examinations etc. refer the University OrdinanceBooklet the various conditions/provisions pertaining to examinations as prescribed in the following Ordinances-

Ordinance No. 1	:	Enrolment of Students.
Ordinance No.2	:	Admission of Students
Ordinance No. 4	:	National Cadet Corps
Ordinance No. 6	:	Examination in General (relevant extracts)
Ordinance No. 18/2001:		An Ordinance to provide grace marks for passing in a Head of passing and Inprovement of Division (Higher Class) and getting Distinction in the subject and condonation of defficiency of marks in a subject in all the faculties prescribed by the Statute NO.18, Ordinance 2001.
Ordinance No.9	:	Conduct of Examinations (Relevant extracts)
Ordinance No.10	:	Providing for Exemptions and Compartments
Ordinance No. 19	:	Admission Candidates to Degrees
Ordinance No.109	:	Recording of a change of name of a University Student in the records of the University

Ordinance No.19/2001 : An Ordinance for Central Assessment Programme, Scheme of Evaluation and Moderation of answerbooks and preparation of results of the examinations, conducted by the University, Ordinance 2001.

Dineshkumar Joshi
Registrar
Sant Gadge Baba Amravati University

PATTERN OF QUESTION PAPER ON THE UNIT SYSTEM

The pattern of question paper as per unit system will be boradly based on the following pattern.

(1) Syllabus has been divided into units equal to the number of question to be answered in the paper. On each unit there will be a question either a long answer type or a short answer type.

(2) Number of question will be in accordance with the unit prescribed in the syllabi for each paper i.e. there will be one question on each unit.

(3) For every question long answer type or short answer type there will be an alternative choice from the same unit. However, there will be no internal choice in a question.

(4) Division of marks between long answer and short answer type question will be in the ratio of 40 and 60.

(5) Each short answer type question shall Contain 4 to 8 short sub question with no internal choice.

DIRECTION

No. : 43 / 2010 Date : 03/07.2010

Subject : Examinations leading to the Degree of Bachelor of Computer Application (Three Year Degree Course-Semester Pattern), Direction, 2010.

Whereas, University Grants Commission, New Delhi vide D.O.No.F-2/2008/(XI Plan), Dtd.31 Jan.2008 regarding new initiatives under the 11th Plan – Academic Reforms in the University has suggested for improving quality of higher education and to initiate the Academic Reform at the earliest.

AND

Whereas, the Academic Council while considering the above letter in its meeting held on 30.4.2008, vide item No.55 has resolved to refer the same to Dean's Committee, and the Dean's Committee in its meeting held on 19.07.2008 has decided to refer the matter to all Board of Studies.

AND

Whereas the recommendations of various Board of Studies in the faculty of Science regarding Upgradation and Revision of various syllabi and introduction and implementation of Semester Pattern Examination System at under graduate level was considered by the faculty of Science in its meeting held on 7.12.2009 and constituted a Committee of all Chairmen of Board of Studies and one member nominated by Chairmen of respective B.O.S. under the Chairmanship of Dean of faculty to decide the policy decision regarding semester pattern examination system.

AND

Whereas, the Academic Council in its meeting held on 20.2.2010 vide item No.15, has resolved to constitute a Committee of Chairman of Board of Studies in Mathematics, Statistics, Computer Science and Electronics under the Chairmanship of Dean, faculty of Science for framing the syllabus of Bachelor of Computer Application (Computer Science) i.e. B.C.A. (Computer Science).

AND

Whereas, the faculty of Science in its emergent meeting held on 11th May, 2010 vide item No.30 regarding Scheme of Teaching and Examination and B.C.A. course as per Semester pattern has resolved to refer to concerned Board of Studies, and the faculty further resolved to induct the Chairman, B.O.S. in Mathematics, Electronics & Statistics.

AND

The Combined meeting of the Committees appointed by the Academic Council, faculty of Science and B.O.S. in Computer Science in its meeting held on 24 & 25 June 2010 has resolved to accept and recommend a draft syllabi, scheme of teaching and examination and provision to be incorporated in the Ordinance to Examination leading to the Degree of Bachelor of Computer Application to be implemented from the Academic Session 2010-11 for B.C.A. Part-I (Sem-I & II) and onwards, which is accepted by the Hon'ble Vice-Chancellor u/s 14(7) of the Maharashtra Universities Act, 1994 on dated 1.7.2010.

AND

Whereas, Ordinance No.17 of 2003 in respect of Examinations leading to the Degree of Bachelor of Computer Application is in existence in the University as per annual pattern examination system.

AND

Whereas, new scheme of examination as per semester pattern is to be implemented from the Academic Session 2010-11 for Semester-I & onwards which is regulated by an Ordinance and framing of an Ordinance for the above examination is likely to take some time.

AND

Whereas, the admission of students in the semester pattern at B.C.A.. Part-I (Semester-I) are to be made in the Academic Session 2010-11.

Now, therefore, I, Dr. Kamal Singh, Vice Chancellor of Sant Gadge Baba Amravati University, in exercise of powers conferred upon me under sub-section (8) of section 14 of the Maharashtra Universities Act., 1994, do hereby direct as under:

1. This Direction may be called, "Examinations leading to the Degree of Bachelor of Computer Application (Three Year Degree Course-Semester Pattern), Direciton, 2010".

2. This direction shall come into force with effect from the date of its issuance.

3. (i) The following shall be the examination leading to the Degree of Bachelor of Computer Application in the faculty of Science-

   (1) The B.C.A. (Part-I) , Semester -I Examination;

   (2) The B.C.A. (Part-I) , Semester -II Examination;

   (3) The B.C.A. (Part-II) , Semester -III Examination;

   (4) The B.C.A. (Part-II) , Semester -IV Examination;

   (5) The B.C.A. (Part-III) , Semester -V Examination; and

   (6) The B.C.A. (Part-III) , Semester -VI Examination;

(ii) The period of Academic Session shall be such as may be notified by the University.

4. (i) The examination of Semester-I, II, III, IV, V & VI shall be conducted by the University and shall held by the end of each semester separately.

(ii) The main examination of Semester-I, III & V and that of Semester-II, IV & VI shall be held in Winter and Summer respectively.

(iii) The supplementary examination for Semester-I, III & V shall be held in Summer and that of Semester-II, IV & VI in Winter respectively.

5. Subject to their compliance with the provisions of this Direction and of other Ordinances in force from time to time, the following persons shall be eligible for admission to the examinations, namely:-

(a) A student of a College who has prosecuted a regular course of study for not less than one academic year prior to that examination;

(b) A teacher in a Educational Institution eligible under the provisions of Ordinance No.18, and

(c) A women candidate who has not pursued a regular course of study.

Provided that in the case of the persons eligible under clauses (b) and (c) an applicant to the examination shall have attended a full course of laboratory instructions in a College in the subject in which laboratory work is prescribed. The candidate shall submit a Certificate to that effect signed by the Principal of the college.

6. **(I) Every applicant for admission to Examination shall-**

In the case of the Bachelor of Computer Application Part-I, Semester-I Examination, have passed not less than one academic Year previously the 12th standard Examination of the Maharashtra State Board of Secondary and Higher Secondary Education with English and other modern Indian Languages or subject I.T. together with Mathematics or three years Diploma course in Electronics and Computer Engg. or +2 level minimum competency vocational course in Electronics Technology or students passing the 12th Standard Examination of Maharashtra State Board of Secondary and Higher Secondary Education and offering Vocational stream with Mathematics shall be

eligible for admission to the Bachelor of Computer Application Part-I, Semester-I course or an Examination recognized as equivalent thereto in such subjects and with such standards of attainments as may be prescribed.

(II) In the case of B.C.A.. Part-II, (Semester-III & IV) Examination :-

have passed not less than one academic year previously the B.C.A.. Part-I (Sem-I & II) Examination of the University or an examination recognised as equivalent thereto, and

(III) In the case of the B.C.A.. Final, (Sem-V & VI) Examination:-

have passed not less than one academic year previously the B.C.A.. Part-II (Sem-III & IV) Examination Examination of the University or an examination recognised as equivalent thereto;

7. Subject to his/her compliance with the provisions of this Direction and other Ordinances (pertaining to Examination in General) in force from time to time, the applicant for admission, at the end of the course of study of a particular semester to an examination specified in column (1) of the table below, shall be eligible to appear at it, if,

(i) he/she satisfied the condition in the table and the provisions there under.

(ii) he/she has prosecuted a regular course of study in a college affiliated to the University.

(iii) he/she has in the opinion of the Principal shown the satisfactory progress in his/her studies.

TABLE

Name of the Examinatin to appear	The student should have completed the Session / term satisfactorily	The student should have passed
1	2	3
B.C.A. Part-I (Sem-I & II)	Sem-I & II	Qualifying examination.
B.C.A.-II Semester-III	Semester-I & II	One half of the total head prescribed for Sem-I & Sem-II examination
B.C.A.-II Semester-IV	Semester-III	One half of the total head prescribed for Sem-I & Sem-II examination

B.C.A.-III Semester-V	Semester-III & IV	(i) passed the Sem-I & II examination and (ii) One half of the total head prescribed for Sem-III & Sem-IV examination
B.C.A.-III examination	Semester-V	(i) passed the Sem-I & II Semester-VI and (ii) One half of the total head prescribed for Sem-III & Sem-IV examination

(**Note:** For calculating the heads, the theory and the practical shall be consider as a separate head and on calculation fraction if any shall be ignored.)

8. Without prejudice to the other provisions of Ordinance No. 6 relating to the Examination in General, the provisions of Paragraph 5, 8, 10 and 31 of the said ordinance shall apply to every collegiate candidate.

9. The fee for the examination shall be as prescribed by he University from time to time.

10. The Scope of the subjects of all semester opted by the students shall be as indicated in the respective syllabi from time to time. The medium of instruction and examination shall be English.

11. The maximum marks allotted to each subject and paper and the minimum marks which an examinee must obtain in order to pass the examination shall be as per Appendices A, B, C, D, E and F appended to this Direction.

12. The practical examination of all semesters shall be conducted at the end of each semester externally by the University.

13. Successful examinees at the B.C.A. Final (Sem-VI) Examination who obtain not less than 60% marks in aggregate of Sem-I, II, III, IV, V & VI Examination taken together shall be placed in the First Division, those obtaining less than 60% but not less than 45% in the Second Division, and all other successful examinees in the pass Division.

14. There shall be no classification of successful examinees at the Sem-I to Sem-V Examinations.

15. An examinee successful in the minimum period prescribed for the examination, obtaining not less than 75% of the maximum marks prescribed in the subject shall be declared to have passed the examination with Distinction in the subject.Distinction shall not be awarded to an examinee availing of the provision of the exemptions and compartments at any of the examination.

16. Provisions of Ordinance No.18/2001 in respect of an Ordinance to provide grace marks for passing in a Head of passing and Improvement of Division (Higher Class) and getting Distinction in the subject and condonation of deficiency of marks in a subject in all the faculties prescribed by the Statute No.18, Ordinance 2001 shall apply to the Examination under this Direction.

17. As soon as possible after the examinations the Board of Examination shall publish a list of successful examinees at the B.C.A. Part-I, Semester-I & II, B.C.A. Part-II, Semester-III & IV & B.C.A. Final, Semester-V & VI Examination. Such list at the B.C.A. Final Examination shall be arranged in three Divisions. The names of the examinees passing the examination as a whole in the minimum prescribed period and obtaining the prescribed number of places in each subject in the First or Second Division shall be arranged in Order of Merit as provided in the Examinations in General Ordinance No. 6.

18. No Person shall be admitted to B.C.A. Part-I, Semester-I & II, B.C.A. Part-II, Semester-III & IV & B.C.A. Final, Semester-V & VI Examinations, if he has already passed the same examination of this University or an equivalent examination of any other Statutory University.

19. Successful Examinees at the B.C.A. Part-I, Semester-I & II, B.C.A. Part-II, Semester-III & IV Examination shall be entitled to receive a Certificate signed by the Registrar and successful examinee at the end of & B.C.A. Final, Semester-VI Examination, shall on payment of the prescribed fees, receive a Degree in the Prescribed form, signed by the Vice-Chancellor.

Date : 1/7/2010

Sd/-
(Dr.Kamal Singh)
Vice-Chancellor
Sang Gadge Baba Amravati University
Amravati

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Appendix-G

CERTIFICATE

Name of the College/ Institution ……………………………………................

Name of the Department : ……………………………………………...............

This is to certify that this book contins the bonafide record of the practical work of Shri / Kumari / Shrimati ……………………….....................

....

of B.C.A. Part – I / II / III / Semester………………………..…..during the Academic year…………..……..

Dated: ……./ ……./ 20….

Signature of the Teacher
Who taught the examinee

1. ……………………………
2. ……………………………
3.
4. **Head of the Department**

(Note : In absence of certificate for record book (Appendix-G), examinee should not be allowed to appear for the practical examination.)

…………………………………………………...……………...........................

SYLLABUS PRESCRIBED FOR
B.C.A.PART-I
(Implemented from Winter-2010 Examination)
SEMESTER-I

1ST1- Computer Fundamentals

UNIT–I : **Introduction to computer :** History characteristics, classification of computer, block diagram of computer, Generations of computer, types of computer : Micro, mini, main and super.

UNIT – II : **Input/Output Devices :**
Input Devices : Keyboard, MICR, OCR, Bar coding, mouse.
Output Devices : Printers, types of priters, dot matrix printer, laser printer, inkjet printer, VDU (CRT,LCD).

UNIT–III : **Memory :** Memory cell, primary memory, secondary memory.
Primary Memories : RAM, Cache, ROM family;
Secondary Memories : CD, DVD, Flash Memory.

UNIT–IV : **Number System :**
Introduction : Types of number system, decimal, binary, octal & hexadecimal and their inter conversions code : BCD code, ASCII code, EBCDIC code, fixed point & floating point representation of number.

UNIT – V : **Programming Concept :** Algorithm, flowchart, programming languages, assembler, interpreter, compiler.
Programming process : Program design, coding, compilation, execution, testing, debugging, documentation, Structured programming, Features and approaches.

BOOKS:

1) Computer Fundamental : B.Ram, Nas Age Publi.
2) Fundamentals of Computer : V.Rajaraman, PHI Publi.
3) Computer Fundamentals : Preeti Sinha, BPB Publi.
4) Computer Fundamentals and C. Program : Dhamdhere.

Practicals :-
Minimum 8 practicals based on MS-Word, MS-Excel, MS-Power Point.

1ST2- C-Programming

UNIT – I : **Introduction to C :** Brief history of C Language, structure of C Program, C tokens : Character set, keywords, Identifiers, constant, variables, basic data types, data type modifiers, enumerated data type, symbolic constant.

UNIT – II : **Operators and Expressions in C :** Arithmatic, Relational, logical, assignment, compound, increment, decrement, conditional operator, comma operator, bitwise operators.

Precendence and the associativity of operators. Type conversion and type cast operator.

UNIT–III : **I/O Operations in C :**
Formatted I/O : Printf(), scanf()
Unformatted I/O : getchar(), putchar(), gets(), puts(), getch(), putch(), getche(), putche().

UNIT–IV : **Controlled structures in C :**
if, if—else, elseif ladder, nested if, switch, goto label, for, while, do——while, nesting of loops, break, continue.

UNIT–V : **Arrays :** Declaration and initialization of one and two dimensional arrays.
Pointers : Declaration and initialization, pointer arithmetic, pointer comparison, array of pointers.

Books Recommended :-

(1) Programming in C – E. Balguruswamy, TMH Publications.
(2) Programming in C – Ravichandran
(3) Programming with C – Venugopal and Prasad, TMH Publications.
(4) C Programming – Holzner, PHI Publication.
(5) Let us C – Yashvant Kanetkar, BPB Publication.

Practicals :- Minimum 08 practicals based on Unit-I to Unit-V.

1ST3 – Digital Techniques-I

UNIT-I : **Number System :**
Binary, Octal, Hexadecimal, Decimal to binary, decimal to octal, decimal to hexadecimal, binary to decimal, octal to decimal, hexadecimal to decimal, binary to hexadecimal, binary to octal, hexadecimal to binary and octal to binary conversions. Addition and substraction in binary, octal and hexadecimal 1's and 2's compliment method of binary substraction.
Logic operaters and logic gates :
OR, AND, NOT, NAND and EX-OR operators. OR, AND, NOT NAND, NOR, EX-OR and EX-NOR gates.

UNIT-II : **Logic Families :**
Classification of Logic families, characteristics (Fan-in, Fan-out, Noise immunity, propagation delay, power dissipation) construction and working of DTL, TTL, ECL, & CMAS Logic.

UNIT-III : **Boolean algebra :**
Boolean laws, Boolean identities, Demorgans theorems.
Implementation of Boolean equations :
SOP, POS, Simplification of Boolean equation using Boolean

laws & theorems, simplification of boolean equation using K-map (Upto 4 variable K map).

UNIT-IV : Arithmetic Logic Unit :

Half adder, Half subtractor, Full adder, Full subtractor, 4-bit binary parallel adder, subtration using 1's & 2's complement method, Controlled 4-bit parallel adder/subtractor (1's & 2's Complement), study of ALU IC-74181.

UNIT-V : Combinational Logic Circuit :

Basics of decoder, 2:4 decoder, 3:8 decoder, 4:16 decoder, extension of decoder to demultiplexer, Basics of Multiplexer, 2:1 mux, 4:1 mux, and 16:1 multiplexer.

TEXT BOOKS :

1. Digital Electronics and Microcomputer - R.K.Gaur-Dhanpati publications.
2. Digital fundamentals - Floyd - Universal Book stall, Delhi.

1ST4-Numerical Methods

UNIT – I : Introduction :

A simple mathematical model, Numerical data, Analog and digital computing, process of numerical computing, characteristics of numerical computing, new trends in numerical computing.

UNIT–II : Rounding off Errors :

Errors in Computing, significant digits, Inherent errors, numerical errors, modelling errors, errors definition, round off errors. Error propagation, total numerical error.

UNIT– III : Routs of Equation :

Bracketing Methods – Graphical methods, Bisection method, false position method, numerical problems.

UNIT–IV : Open Methods – Simple fixed point method, Newton-Raphson method & its limitations, the secant method.

UNIT–V : Solution of Linear Equations :

Existence of solution, solution by elimination, Basic Gauss elimination method, Gauss elimination with pivoting, Gauss-Jordan method.

Note : Minimum 16 experiments should be performed based on Unit-I to Unit-V.

Reference Books :-

(1) Numerical Methods for Engineers : Stevenc Chapra & Raymond P. Canale. Publication-Tata Mc-Graw Hill.

(2) Numerical Methods : E.Balguruswamy. Publication-Tata Mc-Graw Hill.

(3) Fundamentals of Mathematical Statistics : S.C.Gupta & V.K.Kapoor. Publication – Sultan Chand & Sons.

(4) Numerical Analysis by S.S.Shastri.

1ST5- MATHEMATICS
DISCREATE MATHEMATICS

UNIT– I : Functions and Relations

(i) Elementary counting principle.
(ii) Function and counting.
(iii) Combinatorial argument.
(iv) Principle of inclusion and exclusion.
(v) Infinite sets and countability.
(vi) Properties of countable sets.

UNIT–II : Generating Functions

(i) Ordinary and Exponential generating functions.
(ii) Basic properties of generating functions.
(iii) Enumerators.
(iv) Azilication to partitions, Ferrer's Graph, dual partitions.
(v) Probability generating functions.
(vi) Application to solving recurrence relation.

UNIT–III: Recurrence Relation

(i) Introduction
(ii) Linear recurrent relation with constant coefficient.
(iii) Homogeneous solution and total solutions.
(iv) Particular solution and total solutions.

UNIT – IV: Boolean Algebra - I

(i) Logic
(ii) Partial Order relations.
(iii) Lattices – definition and elementary properties.
(iv) Principle of duality.
(v) Lattices as algebric systems.

UNIT – V: Boolean Algebra - II

(i) Distributive and complemented lattices.
(ii) Boolean lattices and Boolean algebras.
(iii) Uniqueness of finite Boolean algebra.
(iv) Boolean functions and Boolean expressions.
(v) Disjunctive normal forms and simplification

BOOKS:

1) Elements of Discrete Mathematics by C.L.Liu
2) Discrete Mathematics by Olympia Nicodemi

3) Discrete Mathematical Structures for Computer Science by Alan Doerr and Kenneth Lavassuer.
4) Discrete Mathematics with application by H.F.Mottson jr.
5) Discrete and combinatorial mathematics by A.P.Hillmon., C.L.Alexanerson and R.M.Grassl
6) A first step in Graph Theory by Raghunathan, Numkar and Solapurkar
7) Graph Theory with Applications to Computer Science and Engineering by Narsinghs Deo.
8) Discrete Mathematical Structures for Computer Science by B.Kolman and R.S.Busby.
9) Foundation of Discrete Mathematics by K.D.Joshi (New International Ltd. Publisher, 1996 (Reprint)
10) "Boolean Algebra and Swithching circuits"by Medelson, Tata McGraw Hill Publication Co-Ltd,4/12 Asaf Ali Road, New Delhi.

1ST6-Communication Skill

The theory paper for Semester-I shall consist of Unit-I to Unit-V carrying 10 marks each of total 50 marks. There will be one question on each unit with sub-questions based on syllabus. All the five questions are compulsory.

UNIT – I :	**Grammer and Vocabulory**		**-10**
	1.1	Articles and Preposition	-02
	1.2	Appropriate forms of verbs	-02
	1.3	Synonyms and Antonyms	-04
	1.4	Error Detection	-02
UNIT – II :	**Language Proficiency**		**-10**
	2.1	Types of Sentences	-02
	2.2	Clauses	-03
	2.3	Do as directed	-05
UNIT – III :	**Forms of Written Communication**		**-10**
	3.1	Job Application	-05
	3.2	Preparing Curriculum Vitae	-05
UNIT – IV :	**Creative Writing**		**-10**
	4.1	Preparing Advertisement	-05
	4.2	Composing Messages (Notices, e-mails, telegrams)	-05
UNIT – V :	**Imaginative Approach**		**-10**
	5.1	Story Building	-03
	5.2	Essay Writing	-07

Practicals :-

1SP1 - Lab-I based on 1ST1 & 1ST2

The distribution of marks in practical examination is given as :

(1)	Program writing / execution (based on 1ST1)	15 Marks
(2)	Program writing / execution (based on 1ST2)	15 Marks
(3)	Practical Record	10 Marks
(4)	Viva-voce	10 Marks
	Total	50 Marks

1SP2- Lab-II based on 1ST3

The distribution of marks in practical examination is given as :

(1)	Experiments (Construction, testing and performance)	30 Marks
(2)	Practical Record	10 Marks
(3)	Viva-voce	10 Marks
	Total	50 Marks

1SP3 - Lab-III based on 1ST4

The distribution of marks in practical examination is given as :

(1)	Practical Problems	30 Marks
(2)	Practical Record	10 Marks
(3)	Viva-voce	10 Marks
	Total	50 Marks

*****

SYLLABUS PRESCRIBED FOR
Bachelor of Computer Application
Semester - II Examination

2ST1-Operating System

UNIT – I : **Software :** Types of software, system software, application software, utility software, assembler, compiler, interpreter.
Operating System : Deifnition, types of Operating System, Batch O/S, multi programming, multitasking, introduction

to unix, unix kernel, shell application layer, introduction to linux.

UNIT – II : **Introduction to Operating System :** DOS : Booting processing, formatting, directory structure, FAT.

Internal DOS Commands : REN, CD, MD, RD, DIR, DEL, COPY, TYPE, DATE, TIME, COPYCON, External DOS Commands – FORMAT, XCOPY, CHKDSK, PATH, ATTRIB, AUTOEXEC.BAT, CONFIG.SYS.

UNIT – III : **Functions of Operating System :** Process management, states of processes, process scheduling algorithms.

UNIT – IV : File Management, space allocation techniques, directory types and structures.

UNIT – V : Memory Management, partitions, paging, segmentation, virtual memory management, demad paging, page replacement algorithm.

Books Recommended :-

(1) System Software and Operating System : D.M.Dhamdhere (TMH)
(2) Operating System, 3/e, Nutt Pearson.
(3) Operating System Concept : silbershaz (Addision Education)
(4) System Software : Leyland Beck (Pearson Education)
(5) Operating System : William Stalling
(6) Operating System : A.S.Godbole (TMH)
(7) Operating System : Cowley (TMH)
(8) Modern Operating Systems : Tenenenbaum (Pearson Education)
(9) Operating System : Peterson.

Practical : Minimum 08 practicals based on DOS.

2ST2 - Advanced C

UNIT – I : **String Handlings :** Declaring and initializing string variables, string handling functions :
gets(), strcpy(), strcat(), strlen(), strcmp(), strcpy(), strlwr(), strupr(), strcmp(), strcat(), strstr(), strrev(), strset(), Array of pointers to strings.

UNIT – II : **Function in C :**
Definition, prototype, local and global variables, storage classes function definition, function calling, call by value, call by pointer, return values and their types, functions with arrays, function recursion, pointer to functions.

UNIT – III : **Structures :**
Definition and declaration, initialization, array of structures, nested structure, pointer to structures.

Union : Definition, declaration, and initialization of union, comparison of union with structure.

UNIT – IV : **File Handling :**
Streams and files in C, defining and opening a file (fopen()), file opening modes (options), closing a file (fclose()), I/O operations on File : fof(), fscanf(), fprintf(), getw(), putw(), fgetc(), fputc(), fgets(), fputs(), fread(), fwrite(), sizeof() operator.

UNIT – V : **Random Access :** fseek(), ftell(), frewind().
Handling Errors : feof(), ferror().
Dynamic Allocation of memory, alloc(), malloc(),
C Graphics : Line, circle.

Books Recommended :-

(1) Programming in C – E. Balguruswamy, TMH Publications.
(2) Programming in C – Ravichandran
(3) Programming with C – Venugopal and Prasad, TMH Publications.
(4) C Programming – Holzner, PHI Publication.
(5) Let us C – Yashvant Kanetkar, BPB Publication.

Practicals :- Minimum 08 practicals based on Unit-I to Unit-V.

2ST3 – Digital Techniques-II

Unit-I : **Multivibrators & Flip flops :**
Construction & working of Astable, monostable and Bistable transistorized multivibrators, RS, CLK RS, D, JK, JKMS Flip Flops (Logic diagram, Truth table, construction & working), Concept of edge trigger Flip-Flop, Concept of preset & clear terminal.

Unit-II : **Counters :**
Asynchronous & sunchronous Counter, Up-down counters (Up to 4-bits), modified asynchronous counter, Applications of counters, IC vertion of counters – 7493IC & 7490IC.

Unit-III : **Shift registers :**
Types of shift registers, SISO, SIPO, PISO & PIPO registers (Construction & working), left shift-right shift, registers, IC version of shift register – 7495, Application of shift register. Ring counter, Johnson's counter.

Unit-IV : **Memory :**
Concept of primary & secondary memory, memory hierarchy, classification of memories, Floppy disk, Winchesterdisk, CD, DVD, Semiconductor memories : RAM, ROM, PROM, EPROM, EAROM, EEPROM.

Unit-V : A/D & D/A converters :

Need of A/D & D/A converters.

D/A converters : Weighted registers, R-2R ladder type, Specifications, IC version DAC0808.

A/D converters : Counter type, successive approximation type, Speciafications, IC version, ADC0808.

Books Recommended :

1. Elements of Electronics by Bagade and Singh (S.Chand and company)
2. Electronic devices, application and integrated circuits by Mathur(Kulshrestha,Chadha,Umesh Publication)
3. Pulse, Digital, Switching wave forms by Millman and Taub (Mcgraw Hill-Kogakusha)
4. Basic Electronics -by B.L.Theraja (S.Chand and company)
5. Electronic Instrumentation and measurements system – Cooper (Prentics Hall)
6. Electrical and electronic measurements and instrumentation. A.K.Sawhney (Dhanpat Rai and sons)
7. Principles of electronics instrumentation- A.I.Diefenderfer.
8. A text book of electrical technology B.L.Thereja (S.Chand & Company Ltd.)
9. Functional Circuits in Electronics by Sh.S.G. Pimple (Macmillan Publication, India)
10. Micro Electronic Circuits (Fourth Edition) By Sedra and Smith (Oxford publication)

2ST4 - Numerical Methods

UNIT – I : Curve Fitting :

Least Square Regression : Linear regression, polynomial regression, multiple linear regression.

UNIT – II : General Linear Least Squares, non-linear regression, fitting of transcendental equations.

UNIT – III : Interpolation :

Polynomial forms, linear interpolation, Newton's divided difference interpolation polynomials, Lagrange's interpolating polynomials, interpolation with equidistaut points.

UNIT – IV : Inverse interpolation, spline interpolation, Chebysher interpolation polynomial.

UNIT – V : Numerical Integration : Meaning of numerical integration, trapezoidal rule, Simpson's 1/3 Rule, Simpson's 3/8 rule.

Note : Minimum 16 experiments should be performed based on Unit-I to Unit-V.

Reference Books :-

(1) Numerical Methods for Engineers : Steven C. Chapra & Raymond P. Canale. Publication-Tata Mc-Graw Hill.

(2) Numerical Methods : E.Balguruswamy. Publication-Tata Mc-Graw Hill.

(3) Fundamentals of Mathematical Statistics : S.C.Gupta & V.K.Kapoor. Publication – Sultan Chand & Sons.

(4) Numerical Analysis by S.S.Shastri.

2ST5-MATHEMATICS-II
DISCREATE MATHEMATICS-II

UNIT I : Graph Theory (a)

(i) Definition and elementary results
(ii) Types of Graphs
(iii) Isomorphism
(iv) Adjacency and incidence matrix
(v) Degree sequence and Havel- Halcimi theorem (without proof)
(vi) Sub graphs, induced sub graphs.
(vii) Complement of a graph, self-complementary graphs
(viii) Union, intersection, ring-sum of two graphs.
(ix) Connected, disconnected graph

UNIT II : Graph Theory (b)

(i) Edge sequences, Trail, path, circuit's definitions and elementary results.
(ii) Isthmus, cut vertex
(iii) Vertex and edge connectivity
(iv) Menger's theorem (without proof)
(v) Dijkstra's shortest path algorithm

UNIT III : Graph Theory (c)

(i) Eulerian graphs, Definitions and examples
(ii) Characterization of Eulerian graph in terms of degree
(iii) Fleury's algorithm
(iv) Hamiltonian graph, definition and examples
(v) Sufficient conditions for Hamiltonian graph (without proof)

UNIT IV : Graph Theory (d)

(i) Definition of a tree equivalent Characterization elementary results.
(ii) Centre, radius and diameter of a tree,
(iii) Spanning trees, fundamental circuits and cut sets .
(iv) Binary trees and elementary results

UNIT V : Graph Theory (e)

(i) Kruskal's algorithm for weighted spanning tree.
(ii) Different types of directed graphs
(iii) Connectedness
(iv) Directed trees , arborescence and polish notion
(v) Networks and flows : Definition, examples and construction of flows only.

BOOKS:

1) Elements of Discrete Mathematics by C.L.Liu
2) Discrete Mathematics by Olympia Nicodemi
3) Discrete Mathematical Structures for Computer Science by Alan Doerr and Kenneth Lavassuer.
4) Discrete Mathematics with application by H.F.Mottson jr.
5) Discrete and combinatorial mathematics by A.P.Hillmon., C.L.Alexanerson and R.M.Grassl
6) A first step in Graph Theory by Raghunathan, Numkar and Solapurkar
7) Graph Theory with Applications to Computer Science and Engineering by Narsinghs Deo.
8) Discrete Mathematical Structures for Computer Science by B.Kolman and R.S.Busby.
9) Foundation of Discrete Mathematics by K.D.Joshi (New International Ltd. Publisher, 1996 (Reprint)
10) "Boolean Algebra and Swithching circuits"by Medelson, Tata McGraw Hill Publication Co-Ltd,4/12 Asaf Ali Road, New Delhi.

2ST6-Communication Skill

The theory paper for Semester-I shall consist of Unit-I to Unit-V carrying 10 marks each of total 50 marks. There will be one question on each unit with sub-questions based on syllabus. All the five questions are compulsory.

UNIT–I : Comprehension Skill -10
1.1 Generating Ideas with quick response -05
1.2 Attempting Precis -05

UNIT–II: Command Over Language -10
2.1 Using other forms of verbs. -03
2.2 Voice -02
2.3 Idoms and Phrases -05

UNIT–III: Analytical Ability -10
3.1 Paraphrasing of the poem -05
3.2 Expansion of ideas -05

UNIT–IV: Drafting Language -10
4.1 Domestic Letter -05
4.2 Drafting Reports -05

UNIT–V : General Awareness -10
5.1 One Word Substitute -02
5.2 Short Notes -03
(Audio-visual aids, Interview, Barriers of Communication, Verbal/Non Verbal Communication)
5.3 Personal Response in 100 words 05
(Pollution, Current Affairs, Education)

For References the following books are recommended for Semester-I & II :-

(1) MacMillans English Grammer
(2) Developing Communication Skills by Krishna Mohan, Beena Ayyar.
(3) English for Practical Purposes by Z.N.Patil, B.S.Valke.
(4) English Grammar Composition and Effective Business Communication by M.A.Pink, S.E.Thomas (Editor S.Chand)

Practicals :-

2SP1 - Lab-I based on 2ST1 & 2ST2

The distribution of marks in practical examination is given as :

(1)	Program writing / execution (based on 2ST1)	15 Marks
(2)	Program writing / execution (based on 2ST2)	15 Marks
(3)	Practical Record	10 Marks
(4)	Viva-voce	10 Marks
	Total	50 Marks

2SP2- Lab-II based on 2ST3

The distribution of marks in practical examination is given as :

(1) Experiments (Construction, testing and performance)	30 Marks
(2) Practical Record	10 Marks
(3) Viva-voce	10 Marks
Total	50 Marks

2SP3 - Lab-III based on 2ST4

The distribution of marks in practical examination is given as :

(1)	Practical Problems	30 Marks
(2)	Practical Record	10 Marks
(3)	Viva-voce	10 Marks
	Total	50 Marks

Syllabus Prescribed for
B.C.A. Semester-III & IV
Semester- III

3ST1 - Data Structure

Unit-I : Introduction :
Lists : General Algorithm and operation on data structure. e.g. ADD, DELETE, MERGE, SORT, SEARCH.
Arrays& Stacks:
Definition and examples of arrays and stacks in .C. Implementation infix, postfix & Prefix using stacks and arrays.

Unit-II : Recursion:
Definition of recursion and processes, examples of recursion
Translation from prefix to postfix simulation recursion.

Unit-III : Queues & linked list
Definition of Queue and its representation as linked : single & double lists. Circuler linked list, stack as a circular lists.

Unit-IV : Trees:
Definition of trees & its family definition & representation in a diagramatic mode. Bincury representation of tree as a linked lists.

Unit-V : Sorting : Sequential sort, Binary sort, merge sort, selection sorts, Insertion sort and merging technique.
Serching : Binary Search, Sequentially searching, hashing, indexed search techniques.

Books :

1) Fundamentals of Computer Algorithem : Horowite & Sahani
2) Data structures and Algorithms in C++ : B.R. Weiss Pearsons.
3) Introduction to Data Structure in C: Kamthane (Pearson)
4) Introduction to Data Structure : Bhagat Singh, Nops
5) Data Structure by Trampley and Sorcnson.
6) Data Structure by Horowite & Sahani.

Practical : Minimum 8-practicals based on above topic.

Semester III
3ST2 - Object Oriented Programming with C++

Unit-I : Introduction to oops:
OOps paradigm, features, advantages and applications of oops, Introduction to C++ programme, I/0 functions, preprocessors, directives, Constants and variables, variable declaration and initialization, Type conversion, operators.

Unit II : Control Structure : if, switch, do-while, while and for statement, break, continue and goto statement.
Functions : Function prototype, function calling, function returning and their types, passing arguments to function, inline functions, default argument, overloaded functions.

Unit III : Classes and objects :- Class specification, defining objects, Nesting of member functions, friend functions, passing objects as arguments, returning objects from functions.
Constructors :- Defining constructor, parametrized constructor, multiple constructors in a class, Constructor with default argument, destructor.

Unit IV : Arrays and pointers : Arrays as class member data, Arrays of objects, Pointers to objects, this pointer, memory management using 'new" and "delete'.
Operator overloading :- Overloading unary and binary operator, multiple overloading, rules for overloading operators.
Inheritance : Derived and base class, Types of Inheritance, visibility mode.

Unit V :- Virtual Functions and Polymorphism :
Introductions, pointers to derived class, definition of virtual functions, pure virtual functions, Rules for Virtual functions, Files and streams : Hierarely of file stream classes, opening and closing of files, files modes, file I/O with stream class.

Books Recommended:

i) Object oriented programming with C++ - E, Balaguruswamy
ii) Mastering C++- K.R. Venugopalan
iii) Programming with C++ - Ravichandran
iv) Programming with C++ - Robert lzafore
v) C++ for beginners - B.M. Harwani- SPD Publications.

Practical :- Minimum 8 programmes based on C++

Semester III
3ST3 : Data-Base Management System.

Unit I : Basis Concepts **:** Abstraction and Data integration, Architecture for a database system, components of DBMS, advantages and disadvantages. DBA and its role, Database models : Relational, Hierachical and network, their advantages, and disadvantages.

Unit II : Relational Model : Relation, Domain & artributes, keys, Relational algebra and calulus, Entity Relationship model, Reducing E-R diagram to tables, functional dependancy, Normalization. 1NF, 2NF, 3NF and BCNF.

Unit III : **SQL :** Components of SQL, Data types, operators, DDL Commands : CREATE, ALTER, DROP for tables, DML Commands; SELECT, INSERT, DELETE and UPDATE, order by clause, Group By and Having clause; view and DML operations on view.

Unit IV : Functions: Numeric function : ABS, MOD, FLOOR, CEIL, TRUNC, SQRT, SIGN, SIN, COS, LOG, EXP, LEAST, GREATEST Group functions: AVG, MAX, MIN, SUM, COUNT, Character function : LENGTH, LOWER, UPPER, INITCAP, INSTR, SUBSTR, LPAD, RPAD, LTRIM, RTRIB, DECODE, SOUNDEX, Conversion function: To-NUMBER, To-CHAR' , Joins and union.

Unit V : PL/SQL : Features, Block structure, Constants and variables, data types, control structure, & programming cursor: Implicity and explicity cursor, their attributes, declaring, opening and fetching cursor;

Transaction : SET TRANSACTION, ROLLBACK, COMMIT and AUTO COMMIT, save point, Rollback Segment.

Books Recommended :-

i) An Introduction to Database System - C.J.Date

ii) Database- Management System : Mujumdar & Bhattacharya.

iii) SQL programming - Ivan Bayross

iv) Oracle the Complete reference - Koch & Loney.

v) Database concepts and systems for students by Ivon Bayross.

Practicals : Minimum 08 practicals based on above topics.

Semester-III

3ST4 : Advanced Operating System

Unit-I : **Operating Systems** :

Introduction

Process Management

Process Concept - Definition of process states, process state Transitions, Process Control Block, suspend and reserve.

Unit-II : **Asynchronous Concurrent Processors :**

Parallel procersors,. A control structure for indicating parallelism- Parbegin/Parend.

Mutual exclusion primitives and their implementation. Dekkers & petorsons algorithm.

N-procers synchronization with semaphore Implementing semaphores P and V.

Concurrant Programming:

Critical Regions and Conditional critical region monitors path expresions, message passing.

Unit-III : **Deadlock Indifinite postponement:**

Resource concept, four modification for deadlock, Dead lock prevention. Banker's Algorithm, Deadlock Detection. Deadlock Recovery.

Unit-IV : **Storage Management :**

Real Storage: Storage Organization, Storage Management storage Hierarchy. Storage Management sttrategies contigious 4 non contigious storage allocations. Single UGC contigious storage allocation, fixed 4 variable partition multiprogramming, multiprogramming with storage swapina.

Virtual Storage Management :

Virtual storage management strategies, page replacement strategies, localitu, working sets, page fault - frequency page replacement/ Demand Paging, page release page size.

Unit-V : **Processor Management :**

JOB & Processor Scheduling : Introduction, Scheduling levels, objectives and criteria, Preempative vs. Non-premptive schduling HRN. Schuduling Multilevel feedback Queues fair shzare schduling.

Case Studies : UNIX System, MS-DOS

Books:

1) Operating Systems - H.M. Deitel - Addision Wesley.

2) Operating Systems- John J. Donoven.

Practicals :

3SP1 - Lab I based on 3ST1 & 3ST2

The distribution of marks in practical examination is given as :

(1)	Program writing / execution (based on 3ST1)	15 marks.
(2)	Program writing / execution (based on 3ST2)	15 marks.
(3)	Practical Record	10 Marks
(4)	Viva-Voce	10 Marks
	Total	50 Marks

3SP2 - Lab II based pm 3ST3 & 3ST4

The distribution of marks in practical examination is given as :

(1)	Program writing / execution (based on 3ST3)	15 marks.
(2)	Program writing / execution (based on 3ST4)	15 marks.
(3)	Practical Record	10 Marks
(4)	Viva-Voce	10 Marks
	Total	50 Marks

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SEMESTER III

3ST5 : ELECTRONICS

UNIT-I : Evolution of microprocessor, microcomputer,(Block diagram with function of each block), architecture of Intel 8085 microprocessor, function of each block of 8085, pin diagram and function of all pins of 8085, instruction format. Instruction cycle, fetch and execute operation, machine cycle and state, timing diagram (opcode fetch, MR, MW, IOR, IOW).

UNIT-II : Instruction and programming of 8085

Addressing mode, classification of instruction set of 8085 with examples, concept of stack and stack pointer, PUSH and POP instruction, simple program illustration. Concept of subroutine: CALL and RET instruction, Delay subroutine (using one register and register pair).

Programming : Algorithm, Flowchart, Assembly and machine language, its advantage and disadvantage, assembly language program for addition, subtraction, multiplication, division, finding maximum and minimum numbers.

UNIT III : Interfacing

Basic interfacing concept, memory mapped I/O and I/O mapped I/O schemes, data transfer scheduling. 8255PPI: block diagram, function of each block, pin diagram, , function of each pin, operating modes of 8255, control word format in I/O and BSR mode, illustrative examples.

UNIT-IV : 8086 Architecture

Block diagram of 8086 microprocessor, BIU and EU, operating modes of 8086, register of 8086-G.P.R,pointer and index register, segment register, concept of segmented memory, instruction pointer, status flag, pin diagram of 8086 microprocessor, physical and effective address.

UNIT-V : Instructions and programming of 8086

Instructions: MOV, PUSH, POP, LEA, LDS, LES, Arithmatic & Logic Instructions. Addressing mode, 8086 instruction, Bus cycle , programming: programs of data transfer, addition, subtraction, division, multiplication using various addressing mode.

BOOKS RECOMMANDED:

1) Microprocessor and microcomputer By B.Ram
2) Microprocessor architecture, programming and application by Ramesh Gaonkar
3) Introduction to Microprocessor by A.P. Mathur
4) Microprocessor architecture and application by Dougulas Hall.

3SP3 : LAB-III Based on 3ST5

(PRACTICALS : Atleast 10 practicals based on 8085 microprocessor & 10 practicals based on 8086 microprocessor to be performed by each student)

SYLLABUS FOR

B.C.A. Part-II

Semester IV

4ST1 : Systems analysis design & MIS

Unit-I : System Analysis & Design :

Introduction, Successful systems, systems developments, role of analyst and designer, better system development, Introduction to approaches for SAD, Tradional and structured approaches, Yourdon, Jaclesar, Information Engg., SSHPM, Merise, Euromethod, OOP.

Introduction to communicating with people, types of communication, improving skills - Building better systems, quality concepts, cost & quality, ISO90000 quality in structrured life.

Unit-II : Project Management :

Introduction, stages of system development, Project plannign estimation, monitoring and control.

System Analysis :

Concepts : Introduction, structrured approach, Planning the approach : Introduction, Objectives, Constraints, feasibility study, Asking questing and Collection data.

Recording the information :

Introduction, case tools, FD, entity models, Interpreeting the information collected :

Introduction, modeling, ELH, ECD. Specifying the requirements : Introduction from Analysis to design.

Unit-III : System Design : Protecting the system : Introduction, various damages, protection.

Human Computer I/F : O/P design,

I/P design, dialogue design.

System Interfaces : Introduction

Logical Data Design : Introduction

Files & Databases :

Introduction Physical Data design & program design: DAD, IRC, STD.

Unit IV : MIS :

Introduction, System Implementation, MIS frame work, importance, concepts, management, information system

Definition, IT, Nature & Scope :Characteristics, function, structure & classification : Physical Components, processing functions, decision support, classification of MIS, DSS, ESS, OAS, RES, Various information system.

Decision making and MIS : Types, level, utility management of Information System:

Implementation, Planning, organisation & development, user training, testing, changeover, procedures, evaluation.

Unit V : Information system planning :

Mission, Objectives, strategies, policles, resource, allocation, project planning.

Case study : P vehicle booking information system, Network of Technology Institute.

Books Recommended :

1. System Analysis and Design- Don Yaeatesm, shiebls, Helmy (M).
2. Management Information System - Goyal (M)
3. Workbook on system analysis & Design-Gang & Srinivasan PHI.
4. System Analysis & Design Igon-H-PHI
5. Information System for Modern Management -Murdicle, Ress, Clagett-TMH.
6. Managing with information - Kanter - PHI
7. System Analysis & Design - Edward -TMH
8. Information systems - Hussain &Hussain-TMH.

Practicals : Minimum 8 practicals based on above topics of syllabus.

Semester- IV

4ST2 : Visual Basic

Unit I : Visual nature, programming process, Event drivan programming nodel, VB environment, Vancables, constants, Arrays, Operations, string manipulation, logical Expressions, Decision structures & looping.

Unit II : Objects and classes in VB : Visual design, VB Projects, Creating and using classes, Window common controls Active X Components: creating & testing. OLE : basics, terminological, automation, working with text and graphics in VB, Common dialog control, Image control, picture box control, displaying text, line and shope contrls, the printer objects.

Unit III : Introduction to internal functions : msgbox(s), inputbox(s)

VB Programs : Program structure, private & public procedure, Variable Code, Internal functions : Numeric function, string function.

Unit IV : Working with terms : properties, events and method, Forms Collections, accessing the forms.

Collection using subcripts, uploading forms, placing text on forms, format with print, multiples forms.

Unit V : Files **:** Open statements, file modes, locking the file, close statement, working with sequential access file, Print statement, Input statement, Write statements, working with random access file, put, get statements.

Books :

1) V.B. Unleashed (Techmedia)
2) Teach Youerself YBG . Scott Warner T Mtg.
3) Dan Application Com/ActiveX using VB6 (Techmedia)
4) VB6.0 in 21 days - Grey Perry-
5) Musturing VB 6.0 Block Book -Peter - NMaston-Techmedia.
6) Guide VB6.0 Block Book -Peter-Norton - Techmedia.

Semester- IV

4ST3 : Web Designing and Office Automation

Unit-I : Information Technology : Introduction, office applications, Medical and Health applications, Educational applications, www, other applications in Society, IT projects in India.

IT infrastructures : Site planning, AC, Ergonomics, security, training, communication trends.

Unit-II : Excel : Basics Getting started, tool bar, work book, editing, saving, advanced worksheets using auto format, printing charts, graphs, dealing with web pages.

Unit-III : Access : Introduction, creating, databases and tables, forms, entering and editing data, finding, sorting and displaying data, printing, RDBMS, Import, Export, troubleshooting and maintainance, using with webpages.

Unit-IV : Web Publishing : Introduction, Web authoring, tools, Web page design considerations, principles of design, web site hosting, search engines, Registering web site on search engine.

E-Commerce : Introduction Emergence of E-Commerce, how E-Commerce works, setting up shop on E-Commerce, future vision.

Unit-V : Web Page Construction : HTML-4 Introduction, common tages, Headers, text styling, linking images, formatting text, tables, forms, meta tags.

Introduction to pointshop pro : Image & screen capturing, layers, www resources, Introduction to Ms Visual Interdev, Introduction of Dreamviewer.

Books recommended :

1. Office Automation - K.K. Bajaj (M)
2. ABC's of win 98 - Sharon Grawford and Salkind (BPB)
3. Office Professional - Mansfield (BPB)
4. IT tools and applications (M)
5. Infrastructure for information technology - H Ravindran (M)
6. Business on the net - Agrawal, Lal, Agrawala (M)
7. Web Programming
8. Internet and Web Design - (M)
9. Developing E-Commerce site - Sharma and Sharma (PE)
10. Web Design in a Nut Shell - Jennefer Neiderst (SPD) O'Reily
11. Web 101 - Lenheert (PE)
12. Web Programming with Asp and COM - M.J. Crounds (PE)
13. HTML by example - hararoso & Stanftor (PHI)
14. Internet Standard zand protocols - Naik (PHI)
15. Using HTML4- Philips (PHI)
16. The CompleteIDIOT's guide to Ms-Feront page 2000- Pankar (PHI)
17. Web Publishing - Deseuza and D'souza
18. HTML Complete - BPB

Practicals : Minimum 8 practicals based on above topics of syllabus

Semester- IV

4ST4 : NETWORKING

Unit - I : Network concept, advantages, goals, Network topologies: Star, ring, completely connected N/W, Hybrid N/W, Multipoint N/W, LAN, WAN, OSI, model, ISO etc.

Unit - II : Digital and Analog data transmission, MODEM, and Block diagram of Digital & Analog data communication.
OSI model, media access control, Error Control in network.

Unit - III : Data link protocols, Transmission efficiency.
Network layer : Network topologies, network routing, network standards, Network protocols, TCP/IP, FTP, HTTP.

Unit - IV : LAN : Types, components of LAN, Ethernet, token ring, MAP, MAN & WAN. Fast ethernet, FDDI, switched network, performance improvement.

Unit - V : Types of communication services, Dialed, dedicated and switched circuit services, Packet switched network. Network Security; Needs, threats, Risk assessment, unauthorised Access.

Books-

i) Computer fundamental and Networking, by P.K. Sinha.
ii) Local Area Network by Keiser, TMH Publication
iii) Computer Networks by Andrew S. Tanenbaum PHI Pub.
iv) Data and Computer Communication by W. Stalling.
v) Business Data Communication & Networking by Fitzgerald & Dennis.

Practicals :

4SP1-Lab-I based on 4ST1 & 4ST2

The distribution of marks in practical examination is given as :

(1)	Program writing/execution (based on 4ST1)	15 marks
(2)	Program writing/execution (based on 4ST2)	15 marks
(3)	Practical Record	10 marks
(4)	Viva-Voce	10 marks
	Total	50 marks

4SP2-Lab-II based on 4ST3 & 4ST4

The distribution of marks in practical examination is given as :

(1)	Program writing/execution (based on 4ST3)	15 marks
(2)	Program writing/execution (based on 4ST4)	15 marks
(3)	Practical Record	10 marks
(4)	Viva-Voce	10 marks
	Total	50 marks

SEMESTER-IV

4ST5 : Advance Microprocessors and Microcontroller

Unit-I : **80286 and Instructions:** Salient features of 80286 microprocessor, Internal Architecture, addressing modes, Interrupts, real mode , protected mode, privilege, protection, instruction set features.

Unit-II : **80386:**Register organization of 80386, addressing modes, data types, real addressing mode, protected mode, segmentation, paging, virtual 8086 mode,

Introduction to 80486 and 80586: Salient features, register organization, flag register.

Unit-III : **Microcontroller :** Introduction, comparison of microcontroller & microprocessor, block diagram of 8051 & study of internal blocks, reset clocks, registers, flags & internal memory, I/O ports, counter & timers, interrupts.

Unit-IV : 8051 Instruction Set and Bit and Byte Level programming: Instruction set, addressing mode, data transfer instruction, arithmetic & logic instructions, JUMP & CALL, programming of Bit & Byte, Additions, substraction, multiplication, division.

Unit-V : **8051 Interfacing & Application :**
Basics of serial communication, interfacing with RS-232C interfacing a DAC, interfacing to the 8255, power down mode.

References:

1. The 8086/88, 80186,80286,80386,80486, Pentium and Pentium Pro microprocessors By Barry B. Bray (PHI)
2. Advanced Microprocessors and Peripherals: Ray and Bhurchandi (PHI)
3. The 8051 Microcontroller by Kenneth J. Ayala (Penram)
4. The 8051 Microcontroller by Mazidi and Mazidi (LPE)
5. The 8051 Microcontroller by Predko

PRACTICALS : (4SP3 Lab-III based on 4ST5) Atleast 15 practicals to be performed by each student based on microcontroller 8051 Ic

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27. ENVIRONMENTAL STUDIES

Total Marks : 100

PART-A

SHORT ANSWER PATTERN **25 Marks**

1. The Multidisciplinary nature of environmental studies

. Definition, scope and importance.
. Need for public awareness.

(2 lecture hours)

2. Social Issues and the Environment

. From Unsustainable to Sustainable development
. Urban problems related to energy
. Water conservation, rain water harvesting, watershed management
. Resettlement and rehabilitation of people; its problems and concerns. Case studies.
. Envionmental ethics : Issues and possible solutions.
. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
. Wasteland reclamation.
. Consumerism and waste products.
. Environment 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 lesislation.
. Public awareness. (7 lecture hours)

3. 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 Studies. (6 lecture hours)

PART-B

ESSAY TYPE WITH INBUILT CHOICE **50 Marks**

4. Natural resources :

. **Renewable and non-renewable resources :**

.

Natural resources and associated problems.

- Forest resources : Use and over exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
- Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
- Mineral resources : Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
- Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer - pesticide problems, water logging, salinity, case studies.
- Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, Case studies.
- Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

. Role of an individual in conservation of natural resources.

. Equitable use of resources for sustainable lifestyles. (8 lecture hours)

5. Ecosystems

. Concept of an ecosystem.

. Structure and function of an ecosystem.

. Producers, consumers and decomposers.

. Energy flow in the ecosystem.

. Ecological succession.

. Food chains, food webs and ecological pyramids.

. Introduction, types, characteristic features, structure and function of the following ecosystem :-

- Forest ecosystem
- Grassland ecosystem
- Desert ecosystem
- Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

(6 lecture hours)

6. Biodiversity and its conservation

. Introduction - Definition : genetic, species and ecosystem diversity.

. Biogeographical classification of India.

. Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values.

. Biodiversity at global, National and local levels.

. India as a mega-diversity nation.

. Hot-spots of biodiversity.

. Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.

. Endangered and endemic species of India.

. Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity. (8 lecture hours)

7. 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

. Role of an individual in prevention of pollution.

. Pollution case studies.

. Diaster management : floods, earthquake, cyclone and landslides.

(8 lecture hours)

PART-C

ESSAY ON FIELD WORK **25 Marks**

8. Field work

. Visit to a local area to document environmental assets - river / forest / grass land / 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.

(5 lecture hours)

(**Notes :** i) Contents of the syllabys mentioned under paras 1 to 8 shall be for teaching for the examination based on Annual Pattern.

ii) Contents of the syllabys mentioned under paras 1 to 4 shall be for teaching to the Semester commencing first, and

iii) Contents of the syllabys mentioned under paras 5 to 8 shall be for teaching to the Semester commencing later.

LIST OF REFERENCES :-

1) Agarwal, K.C., 2001, Environmental Biology, Nidi Publ. Ltd., Bikaner.
2) Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad - 380 013, India, Email : mapin@icenet.net **(R)**
3) Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p.
4) Clark R.S., Marine Pollution, Clanderson Press Oxford **(TB)**
5) Cunningham, W.P.Cooper, T.H.Gorhani, E & Hepworth, M.T., 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p.
6) De A.K., Environmental Chemistry, Wiley Eastern Ltd.
7) Down to Earth, Certre for Science and Environment **(R)**
8) Gleick, H.P. 1993, Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press. 473p.
9) Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural Histroy Society, Mumbai **(R)**
10) Heywood, V.H. & Watson, R.T. 1995, Global Biodiversity Assessment, Ca mbridge Univ. Press 1140p
11) Jadhav, H & Bhosale, V.M. 1995, Environmental Protection and Laws, Himalaya Pub. House, Delhi. 284 p.
12) Mckinney, M.L. & Schoch, R.M. 1996, Environmental Science Systems & Solutions, Web Enhanced Edition. 639 p.
13) Mhaskar A.K., Matter Hazardous, Techno-Science Publications **(TB)**
14) Miller T.G.. Jr., Environmental Science, Wadsworth Publishing Co. **(TB)**
15) Odum, E.P., 1971, Fundamentals of Ecology, W.B.Saunders Co., U.S.A., 574p.
16) Rao M.N. & Datta A.K.,1987, Waste Water Treatment, Oxford & IBH Publ. Co. Pvt. Ltd. 345 p.
17) Sharma B.K., 2001, Environmental Chemistry, Goel Publ. House, Meerut.
18) Survey of the Environment, The Hindu **(M)**
19) Townsend C., Harper J., and Michael Begon, Essentials of Ecology, Blackwell Science **(TB)**
20) Dr. Deshpande A.P., Dr. Chudiwale A.D., Dr.Joshi P.P. & Dr. Lad A.B. : Environmental Studies, Pimpalapure & Company Pub., Nagpur.
21) डॉ. विठ्ठल घारपुरे : पर्यावरणशास्त्र, पिंपळापुरे ॲन्ड कंपनी पब्लिशर्स, नागपूर.
22) Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media **(R)**
23) Trivedi R.K. and P.K. Goel, Introduction to Air Pollution, Techno-Science Publications **(TB)**
24) Wagner K.D., 1998, Environmental Management, W.B.Saunders Co., Philadelphia, USA 499p.

(M) Magazine
(R) Reference
(TB) Textbook

25) Environmental Studies : R.Rajgopalan, Oxford Uni. Press, New Delhi, 2005

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Syllabus Prescribed for B.C.A. Semester-V & VI

BCA-III Semester V

5ST1: Core Java

Unit I : Introduction to JAVA -
Introduction to Java, Java Virtual Machine, Object Oriented Principle, Object and Classes, Java Keywords, Variable, Data types and Literals in Java, String, Operators and Casting, Control of Flow, (Selection Statements, Iteration Statements),Command Line Argument.

Unit II : Classes and inheritance:
Introduction to Class and Object, Method, Overloading Method, Constructor, Constructor Overloading, this Keyword, Introduction to Inheritance, Using Super, Multilevel Hierarchy, Abstract class, Using Final.

Unit III : Package and Interface: Package (Defining Package, Finding Package), Introduction to Interface, Defining, and Implementing of Interface, Predefined Package.

Unit IV : Exception Handling and Threads : Exception Handling, Type of Exception, Try, Catch, and Finally. Multiple Catch blocks, Nested Try Statements, throw, throws, Thread Model, Multithreading.

Unit V : Applet, AWT, Input Output Stream : Introduction to Applet, Applet Methods, Introduction to AWT (Working with Windows, Graphic, Text), GUI Components, Using AWT Controls, Layout Managers, and Menus, Event Classes, Event Listener Interface.

Books Suggested

1. Complete Reference (Java 2) – Herbert Schildt - Tata McGraw Hill
2. Java in a nut shell – Flanagan – Orielly Publication
3. Object oriented programming in Java by Dr.Thampi Wiley.
4. Java Programming (for absolute beginner) – Russell – PHI.
5. An Object Oriented Programming with Java – Thomas Wu,TMH.
6. Java Programming For Tim Absolute Beginners - Rt&Sell

5ST2: NETWORK SECURITY

UNIT-I : **Introduction –** Security Trends, Security Services Security attacks, Security mechanisms, A Module for Network security. Classical encryption techniques : Symmetric cipher model, substitution techniques and Transposition techniques

UNIT-II : **Block ciphers and Data Encryption standard -** Block cipher principles, Data Encryption standard, AES Evaluation criteria of AES, The AES cipher

UNIT-III : **Finite fields:** Groups, Rings and Fields, Modular Arithmetic, Euclidean Algorithm, Introduction to numbers theory - Prime numbers, Formats & Euler's theorem, Testing for primarily.

UNIT-IV : **Public key cryptography & RSA:** Principles of Public key crypto Systems, RSA algorithm Message authentication & Hash functions- Authentication requirements, Authentication, Functions, Message authentication codes, Hash function Digital Signatures & Authentication Applications- Digital signatures, Kerberos

UNIT-V : **Security:** E-mail Security- Pretty good privacy, S/MIME, IP Security &Web Security- IP security over view, IP Security architecture, Web Security, Considerations, Secure Socket layer & Transport layer Security, System Security- Intruders, Viruses & related Threats, Firewalls

TEXT BOOK:

1. Cryptography and Networking Security Principles & Practice (fourth edition) Willam Stallings
2. The fundamentals of New Security - John F. Chavwan, Artch. House
3. The Internet Security Guide Book - Juaniata.

5ST 3: Software Engineering

UNIT–I : **Introduction:** Software Processes & Characteristics, Software life cycle models, Waterfall and Spiral Models
Software Requirements analysis & specifications: Requirement engineering, requirement, requirements analysis using DFD.

UNIT–II : **Software Project Management Concepts:** The Management spectrum, The People The Problem, The Process, The Project

Software Project Planning: Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, Risk Management.

Unit-III : System Design, Problem Partitioning, Top-Down and Bottom-Up design; Decision tree, decision table Software design:-Abstraction - Modularity – Software Architecture.

Unit-IV : Structured Programming, OO Programming, Information Hiding, Reuse, and System Documentation, Software Project Management, Resource Management.

Requirements planning.

Unit-V : Software Quality Management, QC and QA, V & V Planning, tools and Techniques, Software Quality parameterswith their definitions, Introduction to ISO.

Books Recommended :

1. Software Project Management by Edwin Bennatan
2. Software Engineering by Roger S Pressman
3. Software Engineering Jalote Wiley India
4. Software Engineering by Sommerville Pearson
5. Management of Information Technology by Pravin Mulay.
6. Software Project Management in Practice by Pankaj Jalote
7. Software Engineering By Deven Shah, Dreamtech Wiely India

5ST4: Computer Graphics

Unit I : **Introduction:**
Introduction, History, Technologies related to computer graphics, Characteristics, Components, Advantages and Disadvantages, Applications of Computer graphics.

Unit II : **Geometrical Transformations:**
Co-ordinate systems, Homogenous co-ordinate systems, Two dimension transformations (rotation, scaling, sharing etc), The Window-to-Viewport Transformation, Raster scanning, CRT (Interface Design).

Unit III : **Drawing Algorithms:**
Line drawing algorithms, circle drawing algorithms Clipping Algorithm (Sudderland-cohen line clipping Algorithm), Projection (Two-dimensional), Bazier, B-spline curves, shadowing, Midpoint Subdivision Algorithm.

Unit IV : Animation:

Introduction, Types of animation, Animation tools- hardware and software, Tweeking, Morphing and its parts, animation Application.

Unit V : Implementation in C : C programming for drawing 2 D objects – line rectangle, arc., circle and ellipse. C Programming for 2–D and 3–D transformations which include translation, rotation, scaling, reflection and shear.

Books:

1. Procedural & Mathematical Elements in Computer Graphics, Rogers, TMH
2. Computer Graphics, Hearn & Baker,PHI

5ST5 : E-commerce

UNIT-I : Introduction to E-Commerce: The Scope of Electronic Commerce, Definition of Electronic Commerce, Electronic Commerce and the Trade Cycle, Electronic Markets, Electronic Data, Interchange, Internet Commerce, E-Commerce in Perspective.

UNIT-II : Business Strategy in an Electronic Age: Supply Chains, Porter's Value Chain Model, Inter Organizational Value Chains, Competitive Strategy, Porter's Model, First Mover Advantage, Sustainable Competitive Advantage, Competitive Advantage using E-Commerce, Business Strategy.

UNIT-III : Introduction to Business Strategy, Strategic Implications of IT, Technology, Business Environment, Business Capability, Existing Business Strategy, Strategy Formulation & Implementation Planning, E-Commerce Implementation, E-Commerce Evaluation.

UNIT–IV : Business-to-Business Electronic Commerce: Characteristics of B2B EC, Models of B2B, EC, Procurement Management Using the Buyer's Internal Marketplace, Supplier-Oriented, Marketplace, Intermediary-Oriented Marketplace, Just-in-Time Delivery, Auctions and Services from Traditional to Internet-Based EDI, Integration with Back-end Information Systems, The Role of Software Agents

for B2B EC, Electronic Marketing in B2B, Solutions of B2B EC, Managerial Issues, Electronic Data Interchange (EDI), EDI: The Nuts and Bolts, EDI & Business.

UNIT–V : Electronic Payment Systems: Is SET a Failure, Electronic Payments & Protocols, Security Schemes in Electronic Payment Systems, Electronic Credit Card System on the Internet, Electronic Fund Transfer and Debit Cards on the Internet, Stored-Valued Cards and E-Cash, Electronic Check Systems, Prospect of Electronic Payment Systems, Public Policy: From Legal Issues to Privacy: EC-Related Legal Incidents, Legal, Ethical, Protecting Privacy, Protecting Intellectual Property.

TEXT BOOKS*:*

1. David Whiteley, "E-Commerce", Tata McGraw Hill, 2000

2. Eframi Turban, Jae Lee, David King, K. Michale Chung, "Electronic Commerce", Pearson Education, 2000

5SP1: LAB I-5ST1+5ST2: Minimum 8 practical on each.

The distribution of marks in Practical examination is given as:

(1)	Program writing/ execution based on 5ST1	15 marks.
(2)	Program writing/ execution based on 5ST2	15 marks.
(3)	Practical Record	10 marks.
(4)	Viva-Voce	10 marks.
		50 marks.

5SP2: LAB II-5ST3+5ST4: Minimum 8 practical on each.

The distribution of marks in Practical examination is given as:

(1)	Program writing/ execution based on 5ST3	15 marks.
(2)	Program writing/ execution based on 5ST4	15 marks.
(3)	Practical Record	10 marks.
(4)	Viva-Voce	10 marks.
		50 marks.

5SP3: LAB III: 5ST5-Minimum 16 Practical / Case Studies.

The distribution of marks in Practical examination is given as:

(1)	Program writing/ execution based on 5ST6	15 marks.
(2)	Case Studies based on 5ST6	15 marks.
(3)	Practical Record	10 marks.
(4)	Viva-Voce	10 marks.
		50 marks.

Syllabus for B.C.A. Sixth Semester

6ST1: .NET Using ASP

Unit-I : **ASP.Net Introduction-**The .Net framework, The .Net Languages, CLR, Types, Objects and Namespaces, Settings for ASP.Net and IIS

Unit-II : **Developing ASP.Net Application -** Asp.Net Application, Differences between Web based and Windows based application, Web From fundamentals, Web Controls.

Unit-III : Explanation of C#.Net, Validation and Rich Control, State Management, Tracing , Logging and Error Handling

Unit-IV : Working With Data-Overview of ADO.Net, ADO.Net Data Access, Data Binding, The Data list ,Data Grid, and Repeater; Files , Streams, and E-Mails.

Unit-V : **Advanced ASP.Net-** Component-Based Programming, Custom Control, Caching and Performance Tuning, Implementing Security, Case Studies.

Books :

1. The Complete Reference ASP.NET, TATA McGRAW-HILL
2. ASP.NET Black Book.

6ST2 : CLIENT SERVER TECHNOLOGY

Unit I : Client-Server Technology and its uses, historical development, client-server technology and heterogeneous computing, Distributed Computer, Computing plate forms, Microprocessor integration and client server computing, implementations and scalability.

Unit II : Fundamentals of client server design, division of labour, Transition to client-server programming; Interaction of client and server communication Techniques and protocols, implementing client server applications, multitasking with process and threads.

Unit III : Scheduling implementations, scheduler internals, primitive Vs non-primitive systems; synchronization-understanding.

Unit IV : Semaphores, semaphore implementation in Novell Netware, windows NT and UNIX, Memory-management, Allocation, sharing and manipulating,

Unit V : Client server computing with ORACLE-Overview of DBMS, client server relationships, ORACLE and client server computing, using SQL with SQL, *DBS, the ORACLE tools and design aids, SQL windows & Power Builder.

Books:

1. Novell's Guide to client-server Applications : Jaffrey D. Schank and Architecture (BPB Public. 1994)
2. Client/server Computing with ORACLE : Salemi (BPB publications 1994)
3. Client/server computing : Smith and Guengerich (PHI) 1998)
4. Client/server Computing : Dewire (Mc Graw-Hill, International)
5. Client/Server Architecture : Bessen (Mc Graw-Hill, International)
6. Building Client Server Networks : Bay Arinze (TMH, 1997)
7. Power Builder: a guide for Developing : Banbara & Allen Client/Server Applications (Mc Graw-Hill International, 1998)
8. Client/Server System Design and : Vaughn Implementation (Mc Graw-Hill International 1997)
9. Mastering ORACLE-7 Client/Server : Bobrowski Computing (TMH 1998)

6ST3 : MULTIMEDIA AND ITS APPLICATIONS

Unit I : **Introductory Concepts:** Multimedia, Definition, CD-ROM and the multimedia highway, Uses of Multimedia; Introduction and Hardware: Definition of Multimedia, CD-ROMs and Multimedia applications, Multimedia requirements-Hardware, Software.

Unit II : **Multimedia Software:** Basic tools, painting and drawing tools, OCR software, Sound editing programs, Animation devices. Linking multimedia objects, office suites, word processor, spreadsheets presentation tools, Types of Authoring tools card and page based, icon based and time based authoring tools, object oriented tools.

Unit III : **Production Building Blocks:** Test-using test in Multimedia, Computers and Text, Font editing and Design tools, Hyper media and Hyper text, Sounds-multimedia system sounds MIDI verses Digital Audio, Audio file formats, Working with sound in Windows, Adding sound.

Unit IV : **Production Tips:** Image-creation, making still images, images colors, Image, File format, Animation-principles of animation, making workable animations Video, using video, Broadcast video, Standard, Integrating Computer and TVs, shooting and editing Video, using Recording formats, Video tips, Video Compression.

Unit V : **Multimedia Project Development and Case Studies:** Project planning, Estimating, RPFs and Bid proposals, Designing, Producing acquiring and using contents, Testing, CD-ROM Technology and Standards.

Designing for the Word Wide, working on the Web, Text for the Web, Images for the Web, Sound for the Web, Animation for the Web.

Books:

1. Multimedia Making It Work (TMH) 1997 : Tay Vaughan

2. Multimedia Power Tooks, 2 Edition : Peter Jerram and M. (Random House Electronic Publishing) Gosney

6ST4: Software Testing

Unit I : **Principles of Testing:** Context of testing in producing software, Phases of Software Project, Quality Assurance and Quality Control , Testing, Verification and validation concepts ,

Unit II : **White Box Testing :** Static testing by Humans, Static Analysis Tools, Structural Testing, Code Functional Testing, Code Coverage Testing, Code Complexity Testing, Challenges in White Box Testing ; Black Box Testing-Need & purpose of Black Box Testing, Requirement based testing, Positive and Negative testing

Unit III : **Integration Testing:** Introduction, Top-Down Integration, Bi-Directional Integration,System Integration; System and Acceptance Testing, System Testing Overview, Functional System Testing, Beta Testing, Non-Functional System Testing, Stress Testing, Interpretability Testing.

Unit IV : Acceptance Testing, Acceptance Criteria, Selecting Test Cases, Executing Acceptance Tests; Performance Testing-Introduction, Factors governing performance testing, Methodology for performance testing

Unit V : Regression Testing:-Introduction, Types of Regression Testing, Understanding the Criteria for selecting Test Case, Classifying Test Cases, Methodology for selecting Test Case;
Test Planning, Management, Execution and Reporting:- Test Planning, Preparing a Test Plan, Setting up Criteria for Testing, Test Case Specification, Developing and Executing Test Cases, Test Summary Report.

Text Book:

1. Software Testing Principles and Practices - Srinivasan Desikan and Gopalaswamy Ramesh, Publisher: Pearson Education.

6ST5: Advance Database Management System

Unit I : **Introduction :** Review of Database Concepts, File Organization concepts, Normalization.
Physical Database Design and Tunning. Index Selection, Overview of Database Tunning, Choices in tuning the conceptual schema.

Choices in tunning queries and views, DBMS Benchmarking. Security.

Unit-II : Concurrency control transactions and schedule, Serializability, Lock based councurrency control lock management, specialized locking techniques, control without locking.

Crash Recovery, Introduction to crash recovery, Log, Check pointing, Recovery from a system crash.

Unit-III : Parallel and distributed databases. Architectures for parallel databases, Parallel query Evaluation and optimization, Parallelizing individual operations, Introduction to distributed databases, Architecture, Fragmentation and Replication, Catalog management, Distributed Query processing, updating distributed data, Distributed transaction management, Distributed Concurrency control, Distributed recovery.

Unit-IV : **Object database Systems :** Objects, Identity, inheritance, Database Design for an ORDBMS, Storage and access methods, Query processing and optimization, Comparing RDBMS with OODBMS and ORDBMS.

Unit-V : **Data Warehousing**
Introduction, DSS and OLTP, Metadata Management in Data Warehouse. Related data structures, OLAP and Data Warehousing environment.
Data mining.
Introductiong and application areas.

Books :

1) Database Management System -Raghu Ramkrishna McGraw Hill. International Editions.

2) Introduction to Database System by C.G.Date.

6SP1: LAB I-6ST1+6ST2: Minimum 8 practical on each.

The distribution of marks in Practical examination is given as:

(1)	Program writing/ execution based on 6ST1	15 marks.
(2)	Program writing/ execution based on 6ST2	15 marks.
(3)	Practical Record	10 marks.
(4)	Viva-Voce	10 marks.
		50 marks.

6SP2: LAB II-6ST3+6ST4: Minimum 8 practical on each.

The distribution of marks in Practical examination is given as:

(1)	Program writing/ execution based on 6ST3	15 marks.
(2)	Program writing/ execution based on 6ST4	15 marks.
(3)	Practical Record	10 marks.
(4)	Viva-Voce	10 marks.
		50 marks.

6SP3: LAB III-Project work with Report.

The distribution of marks in Practical examination is given as:

(1)	Project Work with Report	30 marks.
(2)	Viva-Voce	20 marks.
		50 marks.

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%SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
ORDINANCE NO. 42 OF 2005

Examination in Environmental Studies leading to Bachelor Degree, Ordinance, 2005

Whereas it is expedient to frame an Ordinance relating to Examination in Environmental Studies leading to Bachelor Degree level, hereinafter appearing, the Management Council is hereby pleased to make the following Ordinance.

1. This Ordinance may be called "Examination in Environmental Studies leading to Bachelor Degree, Ordinance, 2005."

2. This Ordinance shall come into force from the Academic session 2005-06.

3. In this Ordinance and in other ordinances relating to the examination, unless there is anything repugnant in the subject or context :-

   (i) "Academic session" means a session commencing on such date and ending with such date of the year following as may be appointed by the Management Council.

   (ii) "Admission to an examination" means the issuance of an admission card to a candidate in token of his having complied with all the conditions laid down in the relevant ordinance, by a competant officer of the University.

   (iii) "Applicant" means a person who has submitted an application to the University in the form prescribed for admission to an examination.

   (iv) "Candidate" means a person who has been admitted to an examination by the University.

   (v) "Regular Candidate" means an applicant who has applied for admission to a Univeristy examination through an affiliated college, Department or Institute in which he/she has prosecuting a regular course of study.

   (vi) "Examinee" means a person who present himself/herself for an examination to which he/she has been admitted.

   (vii) "Examination" means an examination prescribed by the University under the relevant Ordinance.

   (viii) "External Candidate" means a candidate who is allowed to take a University examination in accordance with the provision of Original Ordinance No. 151.

   (ix) " Non-Collegiate Candidate" means a candidate who is not a collegiate candidate.

   (x) An "Ex-student" is a person who having once been admitted to an examination of this University, is again required to take the same examination by reason of his failure or absence thereat and shall include a student who may have joined a college, Department or Institute again in the same class.

   (xi) "Bachelor Degree Examination" means a examination leading to Bachelor Degree of the University.

   (xii) "Previous Year" means a year following by final year of Bachelor Degree.

4. Save as otherwise specifically provided, the conditions prescribed for admission to the examination under this Ordinance shall apply to all persons who wish to take the examination to the Degrees of the University mentioned in para 5 below.

5. The conditions prescribed for admission to examination under this Ordinance shall apply to following degrees of the University :-

   1) Bachelor of Arts
   2) Bachelor of Performing Arts
   3) Bachelor of Fine Arts
   4) Bachelor of Mass Communication
   5) Bachelor of Social Work
   6) Bachelor of Commerce
   7) Bachelor of Business Administration
   8) Bachelor of Science
   9) Bachelor of Computer Science
   10) Bachelor of Computer Applications
   11) Bachelor of Pharmacy
   12) Bachelor of Science (Home Science)
   13) Bachelor of Technology (Cosmetics)
   14) Bachelor of Engineering
   15) Bachelor of Engineering (Part Time) (Civil)
   16) Bachelor of Textile
   17) Bachelor of Technology (Chemical Technology)
   18) Bachelor of Technology (Chemical Engg.)
   19) Bachelor of Architecture, and
   20) Bachelor of Laws (Five Year Course)

6 i) Environmental Studies shall be a compulsory subject for a previous year examination of the following Bachelor Degrees of the University,

   1) Bachelor of Arts

2) Bachelor of Performing Arts

3) Bachelor of Fine Arts

4) Bachelor of Mass Communication

5) Bachelor of Social Work

6) Bachelor of Commerce

7) Bachelor of Business Administration

8) Bachelor of Science

9) Bachelor of Computer Science

10) Bachelor of Computer Applications

11) Bachelor of Pharmacy

12) Bachelor of Science (Home Science)

13) Bachelor of Technology (Cosmetics)

14) Bachelor of Engineering (Part Time) (Civil)

ii) Environmental Studies shall be a compulsory subject for IIIrd & IVth Semester of the following Bachelor Degrees of the University,

1) Bachelor of Engineering

2) Bachelor of Textile

3) Bachelor of Technology (Chemical Technology)

4) Bachelor of Technology (Chemical Engineering)

5) Bachelor of Architecture, and

iii) Environmental Studies shall be a compulsory subject for Vth & VIth Semester of the Degree of Bachelor of Laws (Five Year Course)

iv) Students admitted to Second Year/Third Year/IVth Semester Vth Semester of various degree examination courses in different faculties n the academic session 2005-06 or thereafter shall have to appear for examination in the subject Environmental studies.

7. The main Examination leading to Environmental Studies shall be held in Summer and Supplementary examination in Winter every year, at such places and on such date as may be appointed by the Board of Examinations.

Explanation :- Examination shall be conducted on the basis of one common question paper for all Bachelor Degree examination courses irrespective of annual or semester pattern.

8. Scope of the subject for annual pattern examination and or semester pattern examination shall be as provided under the syllabus.

9. Common question paper for all courses covered under this Ordinance alongwith answer books shall be supplied by the University to the Colleges, Departments and Institutes for conducting the examination of the subject.

10. Valuation of the answer books relating to this subject shall be done at College/Department/Institution level only. Remuneration for valuation of answer books shall not be paid by the University.
Provided that prescribed evaluation fee for evaluation of each answer Book/s of an external examinee/s appeared from the examination centre shall be paid to each examination centre.

11. It shall be obligatory on the part of the College/Department/Institute to submit candidate wise following information to the University on or before the date as may be prescribed by the University :-

Sr. No.	Grade/Category	Marks secured
1.	"A"	- 60 and above
2.	"B"	- 45 to 59
3.	"C"	- 35 to 44
4.	"D"	- 25 to 34
5.	"Fail"	- 24 and below
6.	"Absent"	

12. For the purposes of teaching, learing and examination, the Committee consisting of three teachers shall be appointed by the Principal/ Head of the Department/Head of the Institution under his/her Chairmanship/ Chairpersonship. While appointing three teachers on the said committee, the Principal shall take care that the teachers to be appointed on the committee, if necessary, shall be from different faculty.

13. i) Duration of theory examination of this subject shall be three hour.

ii) For all Bachelor Degree examinations, common question paper of 100 marks shall be provided by the University.

iii) Distribution of these 100 marks shall be as follows :-

a) Part-A, Short Answer Pattern	-	25 Marks
b) Part-B, Essay type with inbuilt choice	-	50 Marks
c) Part-C, Essay on Field Work	-	25 Marks

14. Medium of instruction shall be English or Marathi or Hindi. Question paper shall be supplied in English and Marathi and Hindi. A candidate shall have option to write answers in English or Marathi or Hindi.

15. Examination for the subject Environmental Studies shall be compulsory for external candidates appearing as a fresh candidate at Winter and/or Summer examination.

16. For teaching of the subject, there shall be atleast two hour per week. For teaching the subject to the regular candidates, a full time approved teacher of the University and or a person having Postgraduate Degree in any faculty with second class shall be considered elligible.

17. For teaching of the subject, additional fee to be charged to regular candidate shall be as prescribed by the University.

18. Every College/University Teaching Department shall Charge addtional fee of Rs. 100/- to every student of the subject Environmental Studies. Out of this Rs.100/-, the College/University Teaching Department shall have to pay Rs.25/- to the University as an examination fee of each candidate for the subject Environmental Studies.

19. The Grade secured by an examinee in the examination of this subject shall not be considered for providing the facility of A.T.K.T. in next higher class.

20. The provisions of Ordinance No. 18/2001 shall not be applicable for securing a grade or higher grade in the examination of this subject.

21. Result of the Final Year of the respective Degree shall not be declared of an examinee unless he/she secures any one of the grade in the examination of subject.

    Provided an examinee admitted to Five Year LL.B. course desiring not to continue his/her education beyond Sixth Semester of the said course shall have to secure any one of the grade in the examination of the subject otherwise his/her result of Sixth Semester for awarding B.A. degree shall not be declared.

22. Certificates shall be issued, to the successful examinees in the subject Environmental Studies, after the examination.

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