

B.C.A..Part-I (Sem-I & II) Exam.-2011

Prospectus No. 20111221

संत गाडगे बाबा अमरावती विद्यापीठ  
SANT GADGE BABA AMRAVATI UNIVERSITY

विज्ञान विद्याशाखा  
(FACULTY OF SCIENCE)

**PROSPECTUS**  
OF  
B.C.A.PART-I (SEMESTER-I & II)  
SEMESTER-I EXAMINATIONS-2010  
SEMESTER-II EXAMINATIONS-2011



2010

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**(Prospectus No.20111221)**

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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 Improvement 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.

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**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 11<sup>th</sup> 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 11<sup>th</sup> 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), Direction, 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 12<sup>th</sup> 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 Exam 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 Semester-VI	Semester-V	(i) passed the Sem-I & II examination 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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**Bachelor of Computer Application(B.C.A.)  
Three Year Degree Course  
Teaching and Examination Scheme  
B.C.A. Part- I (Semester – I)**

Appendix-A

S. N.	Subject Code	Paper	Teaching Scheme				Examination Scheme						Total Marks
			Th		Pr	Total Periods Per Week	Duration of Papers (Hrs.)		Max. Marks		Min. Marks		
			L	T			Th	Pr	Th	Pr	Th	Pr	
1	1ST1	Computer Based	5	---	---	5	3	---	60	---	21	---	60
2	1ST2	Computer Based	5	---	---	5	3	---	60	---	21	---	60
3	1ST3	Electronic Based	5	---	---	5	3	---	60	---	21	---	60
4	1ST4	Statistics Based	5	---	---	5	3	---	60	---	21	---	60
5	1ST5	Math Based	5	---	---	5	3	---	60	---	35	---	60
6	1ST6	Communication Skill	4	1	---	5	3	---	50	---	18	---	50
7	1SP1	Lab-I based on 1ST1 & 1ST2	---	---	4	4	---	4	---	50	---	18	50
8	1SP2	Lab-II based on 1ST3	---	---	4	4	---	4	---	50	---	18	50
9	1SP3	Lab-III based on 1ST4	---	---	4	4	---	4	---	50	---	18	50
Total			29	1	12	42			300	150			450

**Teaching and Examination Scheme  
B.C.A. Part- I (Semester – II)**

Appendix-B

S. N.	Subject Code	Paper	Teaching Scheme				Examination Scheme						Total Marks
			Th		Pr	Total Periods Per Week	Duration of Papers (Hrs.)		Max. Marks		Min. Marks		
			L	T			Th	Pr	Th	Pr	Th	Pr	
1	2ST1	Computer Based	5	---	---	5	3	---	60	---	21	---	60
2	2ST2	Computer Based	5	---	---	5	3	---	60	---	21	---	60
3	2ST3	Electronic Based	5	---	---	5	3	---	60	---	21	---	60
4	2ST4	Statistics Based	5	---	---	5	3	---	60	---	21	---	60
5	2ST5	Math Based	5	---	---	5	3	---	60	---	35	---	60
6	2ST6	Communication Skill	4	1	---	5	3	---	50	---	18	---	50
7	2SP1	Lab-I based on 2ST1 & 2ST2	---	---	4	4	---	4	---	50	---	18	50
8	2SP2	Lab-II based on 2ST3	---	---	4	4	---	4	---	50	---	18	50
9	2SP3	Lab-III based on 2ST4	---	---	4	4	---	4	---	50	---	18	50
Total			29	1	12	42			300	150			450



**Teaching and Examination Scheme  
B.C.A. Part- II (Semester – III)**

**Th: Theory, L: Lecturer, T: Tutorial, Pr: Practical**

**Appendix-C**

S. N.	Subject Code	Paper	Teaching Scheme			Examination Scheme						Total Marks	
			Th		Pr	Total Periods Per Week	Duration of Papers (Hrs.)		Max. Marks		Min. Marks		
			L	T			Th	Pr	Th	Pr	Th		Pr
1	3ST1	Computer Based	5	---	---	5	3	---	60	---	21	---	60
2	3ST2	Computer Based	5	---	---	5	3	---	60	---	21	---	60
3	3ST3	Computer Based	5	---	---	5	3	---	60	---	21	---	60
4	3ST4	Computer Based	5	---	---	5	3	---	60	---	21	---	60
5	3ST5	Electronic Based	5	---	---	5	3	---	60	---	21	---	60
6	3SP1	Lab-I based on 3ST1 & 3ST2	---	---	4	4	---	4	50	---	---	14	50
7	3SP2	Lab-II based on 3ST3 & 3ST4	---	---	4	4	---	4	50	---	---	14	50
8	3SP3	Lab-III based on 3ST5	---	---	4	4	---	4	50	---	---	14	50
Total			25	---	12	37	---	---	300	150	---	---	450

**Teaching and Examination Scheme  
B.C.A. Part- II (Semester – IV)**

**Th: Theory, L: Lecturer, T: Tutorial, Pr: Practical**

**Appendix-D**

S. N.	Subject Code	Paper	Teaching Scheme			Examination Scheme						Total Marks	
			Th		Pr	Total Periods Per Week	Duration of Papers (Hrs.)		Max. Marks		Min. Marks		
			L	T			Th	Pr	Th	Pr	Th		Pr
1	4ST1	Computer Based	5	---	---	5	3	---	60	---	21	---	60
2	4ST2	Computer Based	5	---	---	5	3	---	60	---	21	---	60
3	4ST3	Computer Based	5	---	---	5	3	---	60	---	21	---	60
4	4ST4	Computer Based	5	---	---	5	3	---	60	---	21	---	60
5	4ST5	Electronic Based	5	---	---	5	3	---	60	---	21	---	60
6	4SP1	Lab-I based on 4ST1 & 4ST2	---	---	4	4	---	4	50	---	---	14	50
7	4SP2	Lab-II based on 4ST3 & 4ST4	---	---	4	4	---	4	50	---	---	14	50
8	4SP3	Lab-III based on 4ST5	---	---	4	4	---	4	50	---	---	14	50
Total			25	---	12	37	---	---	300	150	---	---	450

**Teaching and Examination Scheme**  
**B.C.A. Part- III (Semester – V)**

Appendix-E

Th: Theory, L: Lecturer, T: Tutorial, Pr: Practical

S. N.	Subject Code	Paper	Teaching Scheme			Examination Scheme						Total Marks	
			Th		Pr	Total Periods Per Week	Duration of Papers (Hrs.)		Max. Marks		Min. Marks		
			L	T			Th	Pr	Th	Pr	Th		Pr
1	5ST1	Computer Based	5	---	---	5	3	---	60	---	21	---	60
2	5ST2	Computer Based	5	---	---	5	3	---	60	---	21	---	60
3	5ST3	Computer Based	5	---	---	5	3	---	60	---	21	---	60
4	5ST4	Computer Based	5	---	---	5	3	---	60	---	21	---	60
5	5ST5	Computer Based	5	---	---	5	3	---	60	---	21	---	60
6	5SP1	Lab-I based on 5ST1 & 5ST2	---	---	4	4	---	4	---	50	---	14	50
7	5SP2	Lab-II based on 5ST3 & 5ST4	---	---	4	4	---	4	---	50	---	14	50
8	5SP3	Lab-III based on 5ST5	---	---	4	4	---	4	---	50	---	14	50
Total			25	--	12	37	---	300	150	---	---	---	450

**Teaching and Examination Scheme**  
**B.C.A. Part- III (Semester – VI)**

Appendix-F

Th: Theory, L: Lecturer, T: Tutorial, Pr: Practical

S. N.	Subject Code	Paper	Teaching Scheme			Examination Scheme						Total Marks	
			Th		Pr	Total Periods Per Week	Duration of Papers (Hrs.)		Max. Marks		Min. Marks		
			L	T			Th	Pr	Th	Pr	Th		Pr
1	6ST1	Computer Based	5	---	---	5	3	---	60	---	21	---	60
2	6ST2	Computer Based	5	---	---	5	3	---	60	---	21	---	60
3	6ST3	Computer Based	5	---	---	5	3	---	60	---	21	---	60
4	6ST4	Computer Based	5	---	---	5	3	---	60	---	21	---	60
5	6ST5	Computer Based	5	---	---	5	3	---	60	---	21	---	60
6	6SP1	Lab-I based on 6ST1 & 6ST2	---	---	4	4	---	4	---	50	---	14	50
7	6SP2	Lab-II based on 6ST3 & 6ST4	---	---	4	4	---	4	---	50	---	14	50
8	6SP3	Lab-III based on 6ST5	---	---	4	4	---	4	---	50	---	14	50
Total			25	--	12	37	---	300	150	---	---	---	450

**NOTE :**

- The strength of students for Practical and tutorial for Under Graduate classes shall be 16 with an addition of 10% with the permission of Vice-Chancellor.
- A period will be counted of 48 minutes duration at Under Graduate Level.
- Distribution of Marks of Practical within the limit of Max. Marks shall be prescribed by B.O.S.

**CERTIFICATE**

Name of the College/ Institution : .....

Name of the Department : .....

This is to certify that this book contains 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.)

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**Syllabus Prescribed for B.C.A.Part-I  
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 printers, 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 :** Arithmetic, Relational, logical, assignment, compound, increment, decrement, conditional operator, comma operator, bitwise operators. Precedence 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 subtraction in binary, octal and hexadecimal 1's and 2's compliment method of binary subtraction.

**Logic operators 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, & CMOS 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, subtraction 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

#### DISCRETE 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 algebraic 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.

<b>UNIT – I</b>	<b>: Grammer and Vocabulary</b>	<b>-10</b>
	1.1 Articles and Preposition	-02
	1.2 Appropriate forms of verbs	-02
	1.3 Synonyms and Antonyms	-04
	1.4 Error Detection	-02
<b>UNIT – II</b>	<b>: Language Proficiency</b>	<b>-10</b>
	2.1 Types of Sentences	-02
	2.2 Clauses	-03
	2.3 Do as directed	-05
<b>UNIT – III</b>	<b>: Forms of Written Communication</b>	<b>-10</b>
	3.1 Job Application	-05
	3.2 Preparing Curriculum Vitae	-05
<b>UNIT – IV</b>	<b>: Creative Writing</b>	<b>-10</b>
	4.1 Preparing Advertisement	-05
	4.2 Composing Messages (Notices, e-mails, telegrams)	-05
<b>UNIT – V</b>	<b>: Imaginative Approach</b>	<b>-10</b>
	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
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Total	50 Marks
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**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
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Total	50 Marks
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**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
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Total	50 Marks
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**Syllabus Prescribed for B.C.A.Part-I**

**Semester-II**

**2ST1-Operating System**

- UNIT – I :** **Software :** Types of software, system software, application software, utility software, assembler, compiler, interpreter.  
**Operating System :** Definition, 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 :** Types 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, demand 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(), strncpy(), 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 & synchronous Counter, Up-down counters (Up to 4-bits), modified asynchronous counter, Applications of counters, IC version 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, Winchester disk, 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, Specifications, 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.Theraja (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 equidistant points.
- UNIT – IV :** Inverse interpolation, spline interpolation, Chebyshev 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.Shastrri.

### 2ST5-MATHEMATICS-II DISCRETE 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- Halcmi 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.

<b>UNIT – I</b>	<b>: Comprehension Skill</b>	<b>-10</b>
	1.1 Generating Ideas with quick response	-05
	1.2 Attempting Precis	-05
<b>UNIT – II</b>	<b>: Command Over Language</b>	<b>-10</b>
	2.1 Using other forms of verbs.	-03
	2.2 Voice	-02
	2.3 Idoms and Phrases	-05
<b>UNIT – III</b>	<b>: Analytical Ability</b>	<b>-10</b>
	3.1 Paraphrasing of the poem	-05
	3.2 Expansion of ideas	-05
<b>UNIT – IV</b>	<b>: Drafting Language</b>	<b>-10</b>
	4.1 Domestic Letter	-05
	4.2 Drafting Reports	-05
<b>UNIT – V</b>	<b>: General Awareness</b>	<b>-10</b>
	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

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Total 50 Marks

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#### 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

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Total 50 Marks

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#### 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

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Total 50 Marks

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