MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR

BACHELOR OF COMPUTER APPLICATION
(Semester Scheme with Choice Based Credit System)

(Effective from session 2016-17)

1. Duration of the Course

The Bachelor of Computer Application (B.C.A) which will be known as BCA (Semester Scheme with Choice Based Credit System) course will consist of six semester's duration which will be conducted in three years. Each semester will be approximately 5 months (minimum 90 working days in a semester) duration.

2. Eligibility:

Candidates seeking admission to the first semester of BCA programme must have passed 10+2 examination in science with at least 50% marks.

3. **Admissions**: Admissions to the first year of B.C.A shall be made, through an entrance examination conducted by the University. The course will be initially offered only in the university campus under Faculty of Science

4. Medium of Instruction

The medium of instruction and examination shall be English.

5. No. of Seats

Total 60 seats on self-finance basis

6. Curriculum

6.1 B.C.A. Programme has a three year, six semester prescribed course structure which in general terms is known as curriculum. It prescribes courses to be studied in each semester as given under courses of study and examination

6.2 B.C.A Programme shall have a curriculum and course contents (syllabi) for the courses recommended by the committee courses in Informatics and Computational Sciences and approved by the academic council of the university.

6.3 The Programme shall follow a credit based semester system. Each academic year is divided in to two semesters as prescribed in 6.1

6.4 Course Credit System/Structure

In general a certain quantum of work measured in terms of credits is laid down as the requirement for a particular degree. A student earns the credits for a particular course by fulfilling the academic requirements viz. attendance and evaluation. The total credits required for completing the B.C.A. program shall be 168. The total number of credits in each semester (I to V semester) shall be 30 and 18 in the VI semester. Number of credits for a course in any semester is calculated as follows.

S. No.	Course	Credits
1	One Lecture or tutorial hr/week	1
2	Two Laboratory hours/week	1
3	Seminar 4hrs/week	2
4	Full semester project	18

Credits are awarded to a student for Theory / Laboratory / Other Courses only if the student satisfies the minimum attendance requirement and the evaluation requirements.

6.5 Seminars

Seminar is a course requirement wherein under the guidance of an internal guide a student is expected to do in depth study of topics allotted to them by doing literature survey, and understanding different aspects of the technology. It is mandatory to give a seminar presentation before a panel constituted for the purpose. 4hrs/week is allotted for seminars, which will be used for seminars by students as well as extension lectures/ seminar by faculty members as well as subject experts from other institutions. Participation in the seminars by the students shall be compulsory. The credits shall be awarded on the basis of the following:

(a) Understanding of the concept and presentation by the student concerned.(50%)
(b) Literature survey & detailed report (25%)
(c) Active participation & attendance in the seminars (25%)

6.6 Project Work

Project work will be offered in the Sixth semester of BCA which shall be typically carried out in the industrial/ Research organization individually by the candidates admitted in the sixth semester. A faculty member will be appointed to guide the students and shall be called the internal guide and the scientist / manager guiding the student (at site) shall be called as external guide. It is mandatory to submit the progress report at every 30 days to the internal guide through the external guide giving number of hours the candidate has worked for the project. During the project period, a student is expected to work at least 36 hrs/week. Thus a candidate who successfully completes the project work can earn 18 credit points. At the end of semester-VI, the student has to submit a formal individual project report in a prescribed format. He is required to submit a certificate of successful completion of the project from his external guide giving total number of hours the candidates has worked toward the project and his conduct during the project work. Evaluation of the project will be carried out by a committee consisting of external examiner and internal examiner by examining the project report, presentation of the project and demonstration of the working model of the project with sufficient data to check the working of the project.

6.7. Earning credits:

At the end of every course, a letter grade is awarded in each course for which a student had registered. On obtaining a pass grade, the student accumulates the course credits as earned credits. A student's performance is measured by the number of credits that he/she has earned and by the weighted grade point average. Some of the subjects in a course may be marked as audit course. Grades obtained in the audit courses are not counted for computation of grade point average. However, a pass grade is essential for earning credits from an audit course. A minimum number of earned credits are required in order to qualify for a degree and continuation of registration at any stage.

The credit system enables continuous evaluation of a student's performance, and allows the students to progress at an optimum pace suited to individual ability and convenience, subject to fulfilling minimum requirement for continuation.

7 REGISTRATIONS:

7.1 Faculty Ad-visor

A student or a group of students is assigned to a faculty ad-visor from the concerned department, who will mentor the student throughout his/her, tenure in the Institute. The

students are expected to consult the faculty ad-visor on any matter relating to their academic performance and the courses they may take in various semesters / summer terms. The faculty ad-visor is assigned to extend guidance to the students enabling them to complete their courses of study for the required degree in a smooth and timely manner. Thus, the role of the faculty ad-visor is of immense importance. The faculty ad-visor is the person to whom the parents/guardians should contact for performance related issues of their ward. In view of the guidance to the students the role of faculty ad-visor is outlined as below

(a) Guidance about the rules and regulations of the courses of study for the Programme
(b) Pay special attention to weak students.
(c) Guidance and liaison with parents of students for their Performances and other personal problems a student may have.

7.2 Each student shall be required to register for course work on the advice of the Faculty Ad-visor at commencement of each semester on the day fixed for such registration and notified by the examination section of the university. Registration involved filling up a registration form by stating the theory course / Laboratory / Seminar / Project, etc.

7.3 Each student shall also register for the audit course/ elective courses in consultation and approval of Faculty Ad-visor.

7.4 Only those students will be permitted to register course works that have cleared all dues of the previous year / semester of the department and Hostel.

7.6 Such students who have earned at least 40 credits out of the total 60 credits in I & II semester of BCA will be allowed to register for the next year. The credit, if any, earned from the audit pass course shall not be counted towards the minimum requirement of the credit. The students admitted second year or third year, but have backlog papers, have to earn the credits for backlog courses on self-study basis. They can appear in the End Semester Examination (ESE) for backlog courses. However if the student appears for end semester examination of backlog course code, the performance of that examination will be considered and his/ her previous performance of End Semester Examination shall be treated as cancelled. The marks obtained by the candidate for Continuous Assessment (CA) shall be carry forwarded and shall be added to ESE marks from backlog papers.

7.7 Such students who have failed to earn minimum 40 credits out of 60 credits in the academic year will not be allowed to register for next higher class. Such students will have to register for the backlog course codes in the respective next semester, undergo class room/Laboratory instructions and appear for CA and ESE. Such student will have to pay tuition fees per course code as decided by the university from time to time.

7.8 For the registration of the third year, the student should have passed all the courses of the first year i.e. student must have earned 60 credits of first year and earned minimum 40 credits out of 60 credits in the second year.

7.9 **Course Coordinator**: For each course, Head of the department/Course Director may appoint a course coordinator to assist him in managing the course.

8 ATTENDANCES:

Regular attendance of the student is an important factor in grading system. No grade can be given to a student unless he/she has attended the course regularly.

8.1 Regular 100% attendance is expected of all students for every registered course in theory, laboratory and seminar. Hence attendance is compulsory and shall be monitored in the semester and students will be informed at the end of the month and end of semester.

8.2 A maximum of 25% absence for the attendance may be condoned only on valid grounds such as illness, death in family or other emergency beyond students control and approved by the Head of the Department / Course Director. Sanctions to be taken within a week after joining if on medical grounds.

8.3 For Students participating in Sports / Cultural event/NCC camps during a semester the maximum number of days of absence shall not exceed 8 days. Any waiver in this context shall be on the recommendation of the Dean - Student Welfare and the student will be required to apply in advance for the leave to the Head/Course Director through Faculty Advisor/Course coordinator. This however shall be within the 25% of absence as mentioned in 8.2

8.4 A student having attendance less than 75% in a paper shall be detained by the Course Director and debarred from appearing in the ESE for that paper in that semester and the

student will have to re-register for the paper as and when it is offered. However, a course instructor/teacher may detain a candidate by awarding I grade for want of required attendance provided the candidate was regular while he was attending the course but the absence was due to medical or other special circumstances and the overall performance in the internal assessment has been very good (70% or more). Such candidates will be required apply to the Head of the department or course Director within three days from the declaration of I grade by the course instructor/teacher. The Course Director/Head of the Department will constitute a committee and the student will be required to appear before the committee to explain his case. If the committee is convinced with the explanation and find that the candidate has satisfied all the conditions for award of grade I, special classes /tutorials (Not exceeding 10% of maximum lectures/classes held) may be conducted before the end semester examination, provided sufficient time period is left before the end semester examination and the course instructor is available for the additional classes/tutorials. In such cases, the student will be required to deposit a fee decided by the committee mainly to meet out the expenses incurred to conduct the additional lectures/tutorials/practical. If the student fails to convert his I grade, the student shall have to re-register for the course as and when it is offered. In such cases the student is given X grade.

8.5 Leave of Absence

a. If the period of leave is for a short duration (less than a week), prior application for leave shall have to be submitted to the Head/Course Director stating fully the reasons for the leave requested for, along with the supporting document(s). Such leave shall be granted by the Head/Course Director

b. Absence for a period not exceeding one week in a semester due to sickness or any other unavoidable reasons for which prior application could not be made may be condoned by the Head of the Department provided he/she is satisfied with the explanation**.**

c. If the period of absence is likely to exceed one week, a prior application for grant of leave will have to be submitted to the Head /Course Director with supporting documents. In each Case the decision to grant leave shall be taken by a committee constituted by the Head/Course Director. The committee on receipt of an application may decide whether the student be asked to withdraw from the course for that particular semester because of his long absence.

8 TEMPORARY WITHDRAWALS FROM THE PROGRAMME

A student seeking temporary withdrawal is granted permission by the Vice-Chancellor to withdraw from the programme for one semester/year for reasons of ill health or other valid reasons on the recommendations of concerned HOD/Course Director on the following terms:

8.1 The student applies to the Head/Course Director within six weeks of commencement of the term or from within six weeks of his / her last attendance in class whichever is earlier, stating the reasons for such withdrawal with supporting documents and endorsement of his/her parents.

8.2 The fee deposited for the current semester shall not be refunded for the students who apply for withdrawal after two weeks of commencement of the terms.

8.3 Normally, a student shall be permitted to avail of temporary withdrawal only once during the Programme duration at the institute and for a maximum duration of two semesters.

8.4 Such student who has discontinued and re-joins again will be governed by rules and regulations, courses of study, syllabi and fee in force at the time of his re-joining the Department. The joining time shall be the normal commencement of the term.

9 MODES OF ASSESSMENT

The Academic Board will decide from time to time on the system of examinations in each course in each semester. The current practice of Assessment of Theory and Laboratory Courses is as follows

9.1 A student is evaluated for theory courses through Internal Assessment and End Semester External Examinations. The IA consists of two internal semester examinations (40% weightage), one conducted during mid-semester and second exam conducted towards end of the semester and teacher evaluation (60% weightage) through home assignments, viva/quiz, regularity etc.

9.2 The relative weightage is 25% for IA and 75% for ESE. Minimum marks for passing is calculated by the sum of marks obtained IA and ESE

The IA marks will be awarded by the teacher concerned and will be presented to the following committee for necessary approval. The committee may call for the internal examination answer books, assignment details etc. if necessary

(a) Head of the Department/Course Director
(b) Course Co-ordinator
(c) Nominee of the Vice-Chancellor

The Internal marks awarded will be displayed on the notice board at least one week before the ESE. Grievances, if any, from the student shall be examined by the above committee. The student will be given an opportunity to represent his case to the committee in the presence of his faculty advisor.

9.3 The teacher shall announce the method of teacher evaluation at the beginning of the semester. All IA and ESE are compulsory for all students for award of credits in a course. The marking for all tests, tutorials and examinations will be on absolute basis. The final percentages of marks are calculated in each course as per the weightage indicated above.

9.4 No credits are awarded if the student remains absent in the Internal examinations and ESE or Continuous Assessment. If a candidate fails to attend in one of the two Internal examinations, in special cases and after satisfied by the reason for absence, department may conduct defaulters examination. The candidate will be required to pay prescribed fee for the defaulter's examination to meet the expenditure towards conducting defaulter's examination.

9.5 The laboratory course whether offered as an independent course or as an attached course with a theory course will have continuous assessment for award of Internal Assessment marks.

Most of the laboratory courses contain two parts as follows:

Part I: Assignments and Part II: Mini project based on implementation of
Concepts of laboratory course

Continuous Assessment of laboratory courses will be based on ,number of assignments/practical satisfactorily completed, punctuality, turn to turn supervision of student work, quality of work of journals, group discussions, overall understanding of the experiment and viva-voce examination (as per requirement of structure of course) .

Mini Project will be also assessed continuously by the concerned teacher and demonstration and presentation of workable mini project will be conducted at the end of the semester. This mini project can be developed by the group of maximum two students only. In such case the 70 % weightage will be given to completed assignments and 30% weightage will be given to the Mini Project otherwise overall evaluation shall consist of 100 % weightage to completed assignments.

9.6 The teacher shall announce the mode of evaluation and distribution of marks at the beginning of the laboratory course. It is obligatory to maintain and submit laboratory journal, prescribed documentation for the laboratory course, and reports.

9.7 The End-Semester Examination (ESE) shall generally be of three hours duration for each theory course and is held as per the schedule declared. The detail time-table for this is declared by the examination section of the university at least two weeks in advance of the conduction of ESE. The ESE for the laboratory course will be of 4 hrs duration.

9.8 All examinations and evaluations that are conducted are compulsory. Credits for a course will be awarded only if the student satisfies the minimum attendance requirements and acquires the necessary minimum grades for that course. No credits are awarded if the student remains absent in internal examinations or ESE even though he/she has minimum attendance requirements.

9.9 Assessment of Project:

At the end of the sixth semester of study, a student will be examined in the course “Project”.

1. Project work must be performed individually.
2. Each Student shall be reporting with the progress in work to the internal guide as well as for guidance in project work.

3. The project Work should be of such a nature that it could prove useful or be relevant from the commercial/management/engineering / scientific angle.

4. The project report should be prepared in a format prescribed by the department which also specifies the contents and methods of presentation.

5. The project work carries 18 credits. The viva shall be conducted by the panel of minimum three examiners out which at least one examiner will be external examiner

10. THE GRADING SYSTEM

10.1 Award of Grade

(a) The academic performance of a student is graded on a ten point scale. The letter grades, the guidelines for conversion of marks to letter grades and their equivalent grade points are as follows:

Sr. No	Grade	Grade points	Marks Range	Grade point Description of Performance
1	A+	10	91-100	Outstanding
2	A	9	81-90	Excellent
3	B+	8	71-80	Very Good
4	B	7	61-70	Good
5	C+	6	51-60	Average
6	C	5	41-50	Below Average
7	D	4	31-40	Marginal
8	E	2	21-30	Poor
9	F	0	0-20	Very Poor
10	I	0		Absent in the Exam but not detained (Incomplete)
	AP	0	40-100	Audit Pass
	AF	0	0-39	Audit Fail
	U	--		Unsatisfactory
	W	--		Withdrawal
	X	--		Continued
	S	--		Satisfactory Completion
	Z	--		Course Continuation

b. Description of the grades

A+ to D

The student shall pass the course if he/she gets any grade in the range "A+" to "D".

E and F grades:

The E and F grades denote poor and very poor performance i. e. failing a course. A student has to repeat all core courses in which he/she obtains either E or F grades until a passing grade is obtained. For the other (elective) courses in which E or F grades have been obtained the student may take the same course or any other courses from the same category. The E and F grades secured in any course stay permanently on the grade card. These grades are not counted in the calculation of the CGPA; however these are counted in the calculation of the SGPA.

I Grade

I grade denotes incomplete performance in any courses. The student is temporarily assigned grade "I", if he/she is not detained by an instructor but fails to appear for end-semester examination due to valid reason. Such a student will have to appear for the examination as and when conducted. An I grade also may be awarded by an instructor, if a candidates attendance is below 75% but above 60% and the absence is on medical grounds other special circumstances. The students should complete all requirements as per provisions within 10 days of commencement of End Semester Exams, the request to be made to the Head/Course Director.

(c) A student who has awarded grade E or F in a particular course is considered to be failed in that course and no credits will be awarded for the same the student will have to appear for the examination as and when it is conducted.

10.2 Grade "X"

(a) The grade "X" is assigned to the student if his/her attendance is less than 75% in the Lectures/Tutorial/Laboratory course and/or his/her performance in the semester is not

satisfactory and/or he/she fails in the IA of the subject. A student with X grade will not be permitted to take the ESE in that subject. The student will be detained for that subject only and will have to re-register for the subject as and when it is offered and appears as and when it is conducted. However if a student is detained in any of the course he/she, will not be admitted to the next year, unless he/she Re-registers for that course and obtained passing grade

(b) An 'X' grade is treated as equivalent to F for purpose of CGPA calculation, and the following criteria in addition to poor attendance (less than 75% may be considered for the award of X grade: (1) Badly incomplete in semester record (due to non-medical reasons) {for example, in the case of a student who has missed all tests and assignments etc.) (2) Misconduct/use of unfair means in the examination, assignments etc., of a nature serious enough to invite disciplinary action in the opinion of the instructor. (It is emphasized that award of the X grade is in the nature of an immediate action in such cases, and the case may be referred to the Disciplinary Action Committee for consideration of further punishment depending on the seriousness of the offence). The names/roll numbers of students to be awarded the X grade should be communicated to the examination section in advance of the end-semester examination.

(C) Following rules apply for the course registered in any semester in which a student has acquired grade "X"

(i) He/she shall try to get a passing grade by registration for full examination in the next regular semester whenever it is offered. In this case the earlier performance of a student in all the evaluations will be treated as null and void.
(ii) A student registering for the course (Grade X) shall undergo all evaluations including IA and ESE and is eligible to acquire any grade between "A+" to "D" or "E / F".

10.3: Method of awarding grades:

(a)The ESE will be conducted by the examination section of the university. The question papers will be set by the examiners appointed by the university as per the syllabus, teaching plan and model question paper. University may conduct center evaluation of the answer books by inviting external examiners or the answer books may be sent to the individual examiners for evaluation. After the evaluation of the answer books based on the IA and ESE marks, a semester board will award the grades.

(b) The semester board will consist following

(i) Convener of the Committee of Courses

(ii) Head/Course Director

(iii) Two subject experts

(iv) Nominee of the Vice chancellor

In case semester board feels moderation/re-checking of the answer book is necessary, recommendation with reason will be sent for the consideration of the Result committee of the University. The semester board will maintain strict confidentiality of the marks and results. The result will be declared by the Controller of Examinations.

(c)Evaluated answer papers of IA and ESE should be preserved at least for a minimum period of one semester.

11. Calculation SGPA and CGPA

11.1 Semestre Grade Point Average (SGPA)

a) The performance of a student in a semester is indicated by the number called SGPA

b) The SGPA is the weighted average of the grade points obtained in all the courses registered by the student during the semester

c) If a numerical grade point equivalent to letter grade obtained by the student for the course with credit Ci then, SPGA for that semester calculated using the formula

$$\text{SPGA} \qquad \frac{\sum Cigi}{\sum Ci}$$

Where summation is for all the courses registered by a student in that semester. For example, if a student passes five courses in a semester with

credits c1,c2,c3,c4,c5 and his grade points in these courses are g1, g2,g3,g4,g5 respectively, then SPGA is equal to

$$\text{SPGA} = \frac{c1g1 + c2g2 + c3g3 + c4g4 + c5g5}{c1 + c2 + c3 + c4}$$

The SPGA is calculated to two decimal places and rounded off.

d) For the students acquiring "I" grades in any of the courses, SPGA and CPGA calculated only after make-up examination.

e) Since the grades "I" are only temporary grades, they are not taken in the calculation of SPGA. The conversions of letter grades into SPGA and CPGA for the students acquiring "I" grade in any of the courses is suspended till declaration of the grades of make-up examination.

11.2 Cumulative Grade Point Average (CGPA)

(a) An up-to- date assessment of the overall performance of a student from the third semester onwards till completion of the programme is obtained by calculating a number called CGPA

(b) The CGPA is weighted average of the grade points obtained in all the courses registered by the student since the beginning of the third semester of the programme

$$\text{CGPA} = \frac{\sum Cigi}{\sum Ci}$$

Where summation is for all the courses registered by a student till that semester. The CGPA is also calculated at the end of every semester from third semester onwards to two decimal places and is rounded off.

(c) The CGPA shall reflect all courses done by the student including courses where he/she has failed.

(d) If a student is awarded with a passing grade for a course in which he/she was awarded previously "E" grade or "F" grade then CGPA is calculated by replacing

corresponding Ci and gi in both numerator and denominator of the above formula. Thus a course is included only once in CGPA calculation. The latest performance of a student in a course is considered for CGPA.

11.3 A candidate admitted to the BCA programme will be required to pass the course within five academic years from the year of admission to the first semester.

12. Courses of Study and Examination

Semester – I

Paper	Paper Name	L-T-P	No.of credits	Max. Marks		Total
				University Exam.	Internal Assessment	
Paper-I (BCA-S101)	Introduction to Information Technology	3-1-0	4	80	20	100
Paper-II (BCA-S102)	PC Software Packages	3-1-0	4	80	20	100
Paper-III (BCA-S103)	Business Data Processing	3-1-0	4	80	20	100
Paper-IV (BCA-S104)	Computer Organization	3-1-0	4	80	20	100
Paper-V (BCA-S105)	Practical-I Computer Hardware Lab.	0-0-8	4	80	20	100
Paper-VI (BCA-S106)	Practical-II ICT & PC Software Lab.	0-0-8	4	80	20	100
Paper-VI (BCA-S107)	Language Lab	1-0-2	2(AP)		50	50
Paper VII (BCA-S108)	Seminar	4	2		50	50
Paper IX (BCA-S109)	Extension Activities (Required to choose one activity from the list of activities)	2	1 (AP)		25	25
Paper X (BCA-S110)	Basic Mathematics (Only for those have not studied Maths at 10+2 Level)	3-1-0	4(AP)		100	100
	TOTAL		33(28)			

In addition to the above, candidate shall be required to offer Compulsory papers as per university rules for undergraduate courses. Grades equivalent to Audit courses shall be awarded for these courses and shall be listed under COMPULSORY SUBJECTS

Semester – II

Paper	Paper Name	L-T-P	No. of credits Ab	Max. Marks		Total
				University Exam.	Internal Assessment	
Paper-I (BCA-S201)	Problem Solving through C programming	3-1-0	4	80	20	100
Paper-II (BCA-S202)	Basic Physics	3-1-0	4	80	20	100
Paper-III (BCA-S203)	Discrete Mathematics	3-1-0	4	80	20	100

Paper-IV (BCA-S204)	Business Communications	3-1-0	4	80	20	100
Paper-V (BCA-S205)	Programming Lab.	0-0-8	4	80	20	100
Paper-VI (BCA-S206)	Basic Physics Lab.	0-0-8	4	80	20	100
Paper-VII (BCA-S207)	Communication Skill Lab	0-0-4	2(AP)		100	100
Paper-VIII (BCA-S208)	Seminar	4	2		50	50
	TOTAL		28			

Semester – III

Paper-I (BCA-S301)	Database Management	3-1-0	4	80	20	100
Paper-II (BCA-S302)	Data Structure using C	3-1-0	4	80	20	100
Paper-III (BCA-S303)	Computer Networks	3-0-2	4	80	20	100
Paper-IV (BCA-S304A or BCA -S304B)	Elective(choose one from following) 1.Business organization and Management 2.Numerical &Statistical Computing	3-1-0	4	80	20	100
Paper-V (BCA-S305)	Programming Lab	0-0-8	4	80	20	100
Paper-VI (BCA-S306)	DBMS Lab	0-0-8	4	80	20	100
Paper-VII (BCA -S307A or BCA -S307B)	Practical Elective (choose one from following) 1 .Web Design 2. Desk Top Publishing	0-0-4	2(AP)		50	50
Paper VIII (BCA-S308)	Seminar	4	2		50	50
Paper IX (BCA-S309)	Extension Activities (Required to choose one activity from the list of activities)	2	1 (AP)		25	25
	TOTAL		29			

Semester – IV

Paper	Paper Name	L-T-P	Credits	Max. Marks		Total
				University Exam.	Internal Assessment	
1	2	3	4	5	6	7
Paper-I (BCA-S401)	System Analysis & Design	3-1-0	4	80	20	100
Paper-II (BCA-S402)	Fundamentals of Operating System	3-1-0	4	80	20	100
Paper-III (BCA-S403)	Object Oriented Programming using C++	3-0-2	4	80	20	100

Paper-IV (BCA-S404A/S404B)	Elective(Choose one from following) A. Management information System B. Business Accounting	3-1-0	4	80	20	100
Paper-V (BCA-S405)	OOPS Lab	0-0-8	4	80	20	100
Paper-VI (BCA-S406)	Linux &Windows OS Lab.	0-0-8	4	80	20	100
Paper-VII (BCA-S407A/S407B)	Practical Elective(Choose one from following) 1.Accounting Software Lab 2.Animation Lab	0-0-4	2(AP)		50	50
Paper-VIII (BCA-S408)	Seminar	4	2		50	50
	TOTAL		28	525	225	750

Semester – V

Paper	Paper Name	L-T-P	Credits	Max. Marks		Total
				University Exam.	Internal Assessment	
1	2	3	4	5	6	7
Paper-I (BCA-S501)	Software Engineering	3-0-2	4	80	20	100
Paper-II (BCA-S502)	Java Programming	3-0-2	4	80	20	100
Paper-III BCA-S503	Web Technology	3-1-0	4	80	20	100
Paper-IV BCA-S504A/S504B	Elective A.Network management & Security B. Client Server Computing	3-1-0	4	80	20	100
Paper-V (BCA-S505)	Practical-I: Java Programming Lab	0-0-8	4	80	20	100
Paper-VI (BCA-S506)	Practical-II Minor Project Based on Web technology	0-0-8	4	80	20	100
Paper-VII (BCA-S507A/S507B)	Practical Elective(Choose one from following) 1.Mircosoft .NET Programming 2.Advanced Web Tools	0-0-4	2(AP)		50	50
Paper-VIII (BCA-S508)	Seminar	4	2		50	50
Paper IX (BCA-S509)	Extension Activities (Required to choose one activity from the list of activities)	2	1 (AP)		25	25
	TOTAL		29	525	225	750

Semester – VI

Paper	Paper Name	No. credits	Max. Marks		Total
			University Exam.	Internal Assessment	
1	2	3	4	5	6
Paper-I (BCA-S601)	Project Work	18	350	100	450
		18			

Total Credits: 168

13.Examination rules

Examination Scheme:

a) University shall conduct examinations only after completion of at least 90 working days of instruction in each semester. External examination will be conducted on consecutive working days without any gap.

b) Each theory paper shall be of 100 marks (75 marks for written examination of 3-hrs duration and 25 marks for internal assessment

c) Each practical/Project paper shall be of 100 marks (75 marks for semester practical examination of six hours duration and 25 marks for internal assessment.

d) The question paper will consist total six questions. Part-A shall consist of one compulsory question of 10 marks with ten parts covering the entire syllabus for which answer must be provided within 20 words for each. Part-B will consist five long answer questions (which requires answers in about 400 words for each), one from each unit with internal choice. Each question in the part-B will carry 13 marks each. Only one answer booklet shall be provided for answering all the questions. No supplementary copies will be provided.

e). Detailed outline of the course and a list of textbooks and reference books and detailed lecture schedule will be intimated to the examiner along with a model paper to provide necessary guide lines to set question paper for the external examination.

SYLLABUS

FIRST SEMESTER

BCA- S101: Introduction to Information Technology

UNIT-I

Computer Basics: Algorithms, A Simple Model of a Computer, Characteristics of Computers, Problem-solving Using Computers.

Data Representation: Representation of Characters in computers, Representation of Integers, Representation of Fractions, Hexadecimal Representation of Numbers, Decimal to Binary Conversion, Error-detecting codes.

Input & Output Devices: Description of Computer Input Units, Other Input Methods, Computer Output Units (Printers, Plotters)

UNIT-II

Computer Memory: Memory Cell, Memory Organization, Read Only Memory, Serial Access Memory, Physical Devices Used to Construct Memories, Magnetic Hard Disk, floppy Disk Drives, Compact Disk Read Only Memory, Magnetic Tape Drives. **Processor:** Structure of Instructions, Description of a Processor, Machine Language and Instruction set. Processors used in desktops and lap tops.

Specification of a desktop and Lap top computer currently available in the market (Specifications of processor, motherboard &chipset, memory, interface & capacity of hard disk & DVD drives, I/O ports)

UNIT-III

Computer Architecture: Interconnection of Units, Processor to Memory communication, I/O to Processor Communication, Interrupt Structures, Multiprogramming, Processor Features, Reduced Instruction , Set Computers (RISC), Virtual Memory. **Software Concepts**: Types of Software, Programming Languages, Software (Its Nature & Qualities), Programming Languages.

UNIT-IV

Operating Systems: History and Evolution. Main functions of OS Multitasking, Multiprocessing, Time Sharing, and Real Time OS with Examples

Database Management System: Purpose and Organization of Database, Introduction to Data Models

Computer Generation & Classifications: First Generation of Computers, The Second Generation, The Third Generation, The Fourth Generation, The Fifth Generation, Moore's Law, Classification of computers, Distributed Computer System, parallel computers.

UNIT- V

Computers & Communications: Introduction to Computer Communications, Introduction to Computer Networks, Types of Networks, OSI/TCP Model, LAN technologies (fast Ethernet &Gigabit Ethernet), How LAN works, Brief survey of active and passive LAN components.

Internet: Network, Client and Servers, Host & Terminals, TCP/IP, World Wide Web, Hypertext, Uniform Resource Locator, Web Browsers, IP Address, Domain Name, Internet Services Providers, Internet Security, Internet Requirements, Web Search Engine, Net Surfing, Internet Services, Case Study, Intranet.

Cyber Laws: Introduction to Cyber Laws**,** Cyber crime, Cyber contract, Cyber privacy, ITAct

Recommended Books

1. P .K. Sinha ,Fundamentals of Computers, BPB Publications
2. 1.V. Rajaraman, Fundamentals of Computers, 3rd Edition , PHI Publications

BCA-S102: PC Software Packages

(This paper must be taught in the Lab using PC software)

UNIT-I

DOS: Introduction, history & versions of DOS, DOS basics- Physical structure of disk, drive name, FAT, file & directory structure and naming rules, booting process, DOS system files, DOS commands- internal & external,

UNIT-II

Windows Operating System : Windows concepts, Features, Windows Structure, Desktop, Taskbar, Start Menu, My Computer, Recycle Bin, Windows Accessories- Calculator, Notepad, Paint, Wordpad, Character Map, Windows Explorer, Entertainment, Managing Hardware & Software- Installation of Hardware & Software, Using Scanner, System Tools, Communication, Sharing Information between programs.

UNIT-III

Word Processing; MS-Word: Features, Creating, Saving and Opening Documents in Word, Interface, Toolbars, Ruler, Menus, Keyboard Shortcut, Editing, Previewing, Printing,& Formatting a Document, Advanced Features of MS Word, Find & Replace, Using Thesaurus, Using Auto- Multiple Functions, Mail Merge, Handling Graphics, Tables & Charts, Converting a word document into varipus formats like- Text, Rich Text format, Word perfect, HTML etc.

UNIT-IV

Worksheet- MS-Excel: Worksheet basics, creating worksheet, entering into worksheet, heading information, data, text, dates, alphanumeric values, saving & quitting worksheet, Opening and moving around in an existing worksheet, Toolbars and Menus, Keyboard shortcuts, Working with single and multiple workbook, working with formulae & cell referencing, Auto sum, Coping formulae, Absolute & relative addressing, Worksheet with ranges, formatting of worksheet, Previewing & Printing worksheet, Graphs and charts, Database, Creating and Using macros, Multiple worksheets- concepts, creating and using.

UNIT-V

Introduction to Power Point: Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

Other packages: DTP software: Brief survey of MS Publisher, Pagemaker, Coreldraw.
Adobe Photoshop

Recommended Books:

1. PC Software for Windows – R.K. Taxali
2. Unix Concepts and Applications – Sumitabha Das

BCA -S103:
Business Data Processing

UNIT-I

Introduction to Data Processing

Introduction to Data and Information, Logical and Physical Concept of Data, File organization, Different Systems of Data Processing, Business Data Processing (Identification Data, Classification of Business Data File, Data Security, Data Integrity and Type of Checking, Basic Task in Business Data Processing, File Generation, File Backup).

UNIT-II

Business Accounting

Accounting, Accounting Conventions (Single and Double Entry), Basic Accounting Equation, Types of Accounts, Personal Accounts, Impersonal Accounts, Real, Nominal, Terms in Accounting, Assets, Liabilities, Capital, Goods, Debtor, Creditor, Gross Profit, Net Profit, Revenue, Expense, Types of Vouchers, Journal Entries, Final Accounts, Trading / Manufacturing Account, Profit / Loss Account, Balance Sheet,

UNIT-III

Introduction to ACCESS

Introduction to Database, DBMS, RDBMS, Feature of Access, Designing Database, Relationship (One to One, One to Many, Many to One, Many to Many)

UNIT-IV

Create Table (Design View, Wizard, and Datasheet View), Query (Update Query, Delete Query, Selection Query, Cross Table Query, Make Table Query).

UNIT-V

Forms, Reports and Labels

Create (Manually, Form Wizard, Auto Form), Sorting, Filtering, Report Creation (Design View and Wizards), Report using Single Tables/ Multiple Tables/Queries, Labels.

Recommended Books

1. O' Level Business System – V. Jain –BPB
2. An introduction to Accounting – T.S. Grewal – Sultan Chand & Co
3. 'Access 2000 Developer hand book – Gilbert – BPB

BCA- S104: Computer Organization

UNIT-I

Overview of electronics:

Electronic components – Register, Capacitor and Inductors, Semiconductor devices – Diodes, Transistors (BJT and FET). Analog vs Digital electronics, Transistor as a switch. Integrated circuits, SSI, MSI, LSI, and VLSI circuits. Multivibrators – astable, bistable, monostable, counters ripple and decade, edge and level triggering.

UNIT-II

Building blocks of computer system:

Basic building blocks – I/O, Memory, ALU and its components, Control Unit and its functions, Instruction –word, Instruction and Execution cycle, branch, skip, jump and shift instruction, Operation of control registers; Controlling of arithmetic operations;

UNIT-III

Addressing techniques and registers:

Addressing techniques – Direct, Indirect, Immediate, Relative, Indexed addressing and paging. Registers – Indexed, General purpose, Special purpose, overflow, carry, shift, scratch, Memory Buffer register; accumulators; stack pointers; floating point; status information and buffer registers.

UNIT-IV

Memory: Main memory, RAM, static and dynamic, ROM, EPROM, EEPROM, EAROM, Cache and Virtual memory.

UNIT- V

Interconnecting System components:

Buses, Interfacing buses, Bus formats – address, data and control, Interfacing keyboard, display, auxiliary storage devices and printers. I/O cards in personal computers.

Introduction to Microprocessors and Microcontrollers: introduction to 8085 micropocesor, examples of few instructions to understand addressing techniques. Difference between microprocessor and microcontrollers.

Recommended Books

1. Andrew S. Tanenbaum , Structured Computer Organization,Printice Hall
2. William Stallings, Computer Organization and Architecture , Sixth Edition, Pearson

PRACTICAL

BCA S105: Practical-I: Computer Hardware Laboratory
Practical based on Paper-I & paper-IV

BCA S106: Practical-II: ICT & Software Laboratory:
Practical based on Paper-II & paper-III

BCA S107: Practical-III: Language Laboratory (Audit Course)
Practical training in Spoken English using Language Lab software like Linguaphone

BCA-S108: Seminar: Seminar topics to be allotted in the beginning of the course by issuing schedule of seminars including faculty seminars

BCA-S110: BASIC MATHEMATICS

(To be offered as an audit pass course by the candidates not studied mathematics at 10+2 level)

Unit I

Algebraic Expressions : Term and degree

Evaluating Algebraic Expressions: Addition and Subtraction of Algebraic Expressions, Multiplication & Division of Algebraic Expressions, Rational Expressions, Operations with Rational Expressions

Factoring :

Difference of squares, quadratic trinomials, splitting middle term

Unit II

Linear Equations

Translating algebraic expressions, Solving linear equations: Addition property, Solving linear equations: Multiplication property, Combining rules, Inequalities Solving linear inequalities

Graphing Linear Equations

The Cartesian coordinate system, The graph of a linear equation, Solve Linear equations in two variables by graph

Unit III

Systems of Linear Equations

Solution of Systems of equations in two variables (addition/elimination)

Quadratic equations

Solution by Special methods: by square root, by Factorization of roots, completing the square, The quadratic formula.

Nature of roots, Sum and product of roots

Unit IV

Radical expressions and complex numbers

Introduction to roots and radicals

Simplifying radical expressions [No variables]

Operations with radical expressions, rationalizing binomials denominators

Complex numbers [Addition and Subtraction]

Equation of lines

Slope of a line, Parallel & perpendicular line, slope intercept form of equation of line, slope point form, two point form, intercept form

Unit V

Conic Sections:

General quadratic equation, conic sections, circles, parabolas, ellipses, hyperbolas

System of Real Numbers:

Natural, whole, integer, rationals, irrationals, graphical representation of real numbers.

SECOND SEMESTER

BCA – S201: Problem Solving through C - Programming

UNIT-I

Algorithm and algorithm development:

Definition and properties of algorithm, flow chart symbols, conversion of flow chart to language, example of simple algorithms, Introduction to program design, errors – syntax error, runtime error, logic error.

UNIT-II

Basics of C – Language:

History, Constants – Integer, Real, Character; Variables and Keywords; Data types and size, constants, arrays, pointers, Operators – arithmetic, relational, logical, increment and decrement, bitwise and assignment, Hierarchy of Operators and Operations, Associativity of Operators, creation and evaluation of expressions.

UNIT-III

Control Structure:

Decision Structure: - Simple if, if – else, if – else – if, nested if, switch case; Loop Control Structure: - while, do while and for; Use of break, go to and continue;

UNIT-IV

Functions:

Function definition, declaration and prototypes, Call by Value and Call by Reference, Scope Rule of Functions.

UNIT-V

Complex C-Language:

Variables – external, static, register; Recursive functions; multi – dimensional arrays; Pointers and arrays, pointer arrays, Structures – declaring and accessing elements, array of structure, File Input/Output – Create, Open, Read, Write, Delete, Close;

Recommended Books:

1. **Yashavant Kanetkar, Let us C**
2. **Balaguruswamy, Programming in C**

BCA – S202: Basic Physics

(This paper must be taught to impart basic knowledge of physics to understand principle behind technologies used in Computer Application. Avoid derivations of equations and problem solving. Question paper must be set accordingly)

UNIT-I

Basic Concepts: Definition of Science, engineering and technology. Importance of Mathematics and Physics in ICT. Units and Dimensions, MKSA Units, Idea of order of magnitude scale of Mass, time and length with examples. Measurement of length using vernier caliper and screw gauge, Newton's laws of motion, physical quantities as scalars and vectors, vector addition, scalar and vector product of two vector, Brief idea of types of forces in nature, torque, rotational motion and moment of inertia, simple examples of conservation of energy, momentum and angular momentum.

Optical instruments: Electromagnetic spectrum, frequency, wavelength and energy associated with electromagnetic radiation, formation of image by lens, eye, Sensitivity of eye to electromagnetic radiation, defects of vision, Brief understanding of telescope, microscope and eye pieces.

UNIT-II

Electrostatics: Concept of Potential and field due to a charge, Gauss's law; dielectric constant, capacitance of a parallel plate condenser, energy stored in condenser, series and parallel combination of capacitances, types of capacitances used in electronic circuits, rating of capacitances.

Current Electricity: Electric current, Ohm's law, types of resistances and colour codes, Kirchhoff's laws, analysis of simple circuits, Thevenin, Norton and maximum power transfer theorems, principle of potentiometer, magnetic effect of current, field due to circular current loop.

UNIT-III

Transducers: Thermoelectric effect and thermocouples, thermistors, LDRs, piezo electric effect, speakers and mic electro chemical effect, primary and secondary cells, batteries. Electrical rating of cells and batteries

Interaction of magnetic field and current: for ce on current carrying conductor, moving coil galvanometer, conversion of galvanometer into ammeter and voltmeter, multimeter.

UNIT-IV

Electromagnetic induction: self and mutual inductances, chocks coil and transformers.

AC circuits: peak and rms voltage and current, power factor, L-R, C-R and L-C-R curcuits with their phase diagrams, series and parallel resonant circuits.
AC &DC current, understanding electric power distribution in offices and houses, electrical safety,electric fuse, rating of electrical accessories. Importance of good earthing.

Semiconductors: Qualitative description of energy bands, metals, insulators and semiconductors, n and p types of semiconductors, semiconductor p-n junction, metal semiconductor junction, current voltage characteristics of pn junction diode, half wave and full wave rectifiers, Zener diode and voltage regulation, LEDs, photo diode, and solar cell.

UNIT-V

Transistors: Definition, Current in bipolar junction transistor, Amplifier: Brief idea of CE,CC amplifier and its charactersistics, gain indecibels,Frequency vs gain graph, cascading amplifiers, Oscillator: Brief idea about oscillators of different frequency range, Different types of wave forms. Brief introduction to Integrated circuits with scale of integration, Use of MOS and CMOS Transistors.

Lasers: Basic principle, He-Ne and semiconductor lasers, basic concepts of communication using optical fibers.

Brief idea of working and uses of Cathode ray Oscilloscope, Working principle of LCD and plasma devices, UPS, SMPS**.**

Recommended Books:

1 Physics, Part-I Kumar, Mittal; Nageen Publication, Meerut.
2 Concepts Of Physics, Part 1, H C Verma; Bharati Bhawan.
3 Concepts of Physics, Part2, H C Verma; Bharti Bhawam.

BCA- S203: Discrete Mathematics

Objectives: The aim of this course is to impart basic knowledge of Mathematics and its further application in various disciplines in computational sciences and technology. As Some of the students in BCA come from Arts , Commerce and Biology stream, Level of course is 12^{th} standard.

Unit-I

Sets & Relations : Sets and elements, Equal sets, Universal set & Empty set, Subsets, Venn diagrams, Basic operations on sets, Union & Intersection, Complements, Difference, Symmetric Difference, Finite Sets, Power sets, Cartesian Products of Sets, Relations, Composition of relations, Types of relations, Equivalence Relations, Partial ordering relations.

Unit-II

Functions : Functions, Composition Function, Mathematical Functions , Exponential and Logarithmic Functions, absolute value function, Limit of function, Evaluation of limits of various types of functions(simple cases)

Trigonometric Functions: Definitions, proofs for any angle θ, signs of ratios, ratios of some standard angles.

Unit-III

Quadratic Equation: Solution of Quadratic Equations, Nature of Roots.

Co-ordinates and Loci: Cartesian co-ordinate system, Introduction to Polar co-ordinates, distance between two points, Area of triangle

Straight Line: Equation of straight line, parallel and perpendicular lines, slope- intercept form, slope-point form, two-point form.

Unit-IV

Differential Calculus: Derivative of a Function, Various Formulae-Product and Quotient Rule of Differentiation, Differentiation of Function of Function(chain rule), Trigonometric functions, Inverse Trigonometric functions, Exponential function, Implicit functions, Differentiation of function w.r.t. another function, Higher Derivatives upto order 3

Unit-V

Integral Calculus : Anti-Derivatives, Constant of integration, Indefinite integral, Elementary Integration Formulae, Methods of Integration, Integration by Substitution, Integration by parts, Concept of Definite integral.

Books:

1. Descrete Mathematics . Schaum's Outlines
2. Differential Calculas By Shanti Narayan, P.K.Mittal
3. Integral Calculas By Shanti Narayan, P.K.Mittal
4. Elementary Calculas By Gokhru & Bhargav.
5. Business Mathematics By Quaji Zameeruddin, V.K.Khanna, S.K.Bhambri
6. Comprehencive Mathematics Class XII Part-A by Parmanand Gupta

BCA-S204: Business Communications

UNIT-I

Concepts and Fundamentals : Meaning of communication, Importance of communication, Communication scope, Process of communication, Communication models and theories, Essentials of good communication - The seven Cs of communication, Factors responsible for growing importance of communication, Channels of communication, Verbal and Non-Verbal communication Formal and Informal communication Barriers of communication.

UNIT-II

Written Communication: Objectives of written Communication, Media of written communication, Merits and demerits of written communication, Planning business messages.

Writing Letters: Business letters, Office memorandum, Good news and bad news letters, Persuasive letters, Sales letters , Letter styles/ layout.

UNIT-III

Report Writing: Meaning & Definition, Types of report (Business report & Academic report), Format of report, Drafting the report, Layout of the report, Essential requirement of good report writing.

Language Skills: Improving command in English, Choice of words, Common problems with verbs, adjectives, adverbs, pronouns, conjunctions, punctuation, prefix, suffix etc.

UNIT-IV

Oral Communication: Principles of effective oral communication, Media of oral communication, Advantages of oral communication, Disadvantages of oral communication, Styles of oral communication.
Interviews: Meaning & Purpose, Art of interviewing, Types of interview, Interview styles, Essential Features, Structure, Guidelines for Interviewer, Guide lines for interviewee.

Arts of Listening: Good listening for improved communications, Art of listening, Meaning, nature and importance of listening, Principles of good listening, Barriers in listening.

Meetings: Definition, Kind of meetings, Advantages and disadvantages of meetings/ committees, Planning and organization of meetings.

UNIT-V

Job Application: Types of application, Form & Content of an application, drafting the application, Preparation of resume.

Project Presentations: Advantages & Disadvantages, Executive Summary, Charts, Distribution of time (presentation, questions & answers, summing up), Visual presentation, Guidelines for using visual aids, Electronic media (power-point presentation).

Business Negotiation: Definition of negotiation, Factors that can influence negotiation, what skills do we need to negotiate, Negotiation process (preparation, proposals, discussions, bargaining, agreement, implementation).

Recommended Books

1. Communication by C.S. Rayudu, Himalaya Publishing House.
2. Communication Today - Understanding Creative Skill by Reuben Ray, Himalaya Publishing House.
3. Successful Communication by Malra Treece.
4. Business Communication Today by Bovee & Thill, McGraw Hill.
5. Principles of Business Communication by Murphy and Hilderbrandth.
6. Effective Communication Skiils by O. N. Kaul & K. K. Sharma, Creative Publishers
7. Chicago Manual of style PHI.
8. Essentials of Business Communication by Rajendra Pal & J. S. Korlahalli, Sultan Chand & Sons.
9. Business Communication by K. K. Sinha.

PRACTICAL:

Practical-I: BCA-S205: Programming Lab

Practical based on paper BCA S 201

Practical-II: BCA-S206: Basic Physics Lab

Practical based on paper SBCA-202

Practical-III (Audit course): BCA-S207: Communication Skill Lab

Practical based on Paper BCA-S204 using Interactive Learning

software/Language Lab software

BCA-S208: **Seminar**: Seminar topics to be allotted in the beginning of the course by issuing schedule of seminars including faculty seminars

Third Semester

BCA- S301: Database Management Systems

UNIT-I

Introduction: Purpose of the data base system, data abstraction, data model, data independence, data definition language, data manipulation language, data base administrator, data base users, overall structure.

ER Model: entities, mapping constrains, keys, E-R diagram, reduction E-R diagrams to tables, generation, aggregation, design of an E-R database scheme.

UNIT-II

Relational Model: The catalog, base tables and views. Relational Data Objects - Domains and Relations: Domains, relations, kinds of relations, relations and predicates, relational databases.

Relational Data Integrity - Candidate keys and related matters: Candidate keys. Primary and alternate keys. Foreign keys, foreign key rules, nulls. Candidate keys and nulls, foreign key and nulls.

UNIT-III

The SQL Language: Data definition, retrieval and update operations. Table, expressions conditional expressions, embedded SQL.

Views: Introduction, what are views for, data definition, data manipulation, SQL support.

UNIT-IV

Network model: basic concepts, data structure diagrams, DBTG CODASYL model, DBTG data retrieval facility, DBTG update facility, DBTG set processing facility, mapping networks to file, networks system.

Hierarchical model: basic concepts, tree structure diagrams, data retrieval facility, update facility, virtual records, mapping hierarchical to files, hierarchical system.

UNIT-V

File and system structure : overall system structure, file organization, logical and physical file organization, sequential and random, hierarchical, inverted, nullist,indexing and hashing, B-tree index files.

Recommended Books

1. Date C.J., Database Systems, Addison Wesley.
2. Korth, Database Systems Concepts, McGraw Hill.

BCA-S302: Data Structures using C

UNIT-I

Linear Structure: Arrays, records, stack, operation on stack, implementation of stack as an array, queue, operations on queue, implementation of queue.

UNIT-II

Linked Structure : List representation, operations on linked list - get node and free node operation, implementing the list operation, inserting into an ordered linked list, deleting, circular linked list, doubly linked list.

UNIT-III

Tree Structure: Binary search tree, inserting, deleting and searching into binary search tree, implementing the insert, search and delete algorithms, tree traversals

UNIT-IV

Graph Structure: Graph representation - Adjacency matrix, adjacency list, adjacency multilist representation. Orthogonal representation of graph . Graph traversals - bfs and dfs. Shortest path, all pairs of shortest paths, transitive closure, reflexive transitive closure.

UNIT-V

Searching and sorting : Searching - sequential searching, binary searching, hashing. Sorting - selection sort, bubble sort, quick sort, heap sort, merge sort, and insertion sort, efficiency considerations.

Recommended Books

1. Horowitz E Sartaj Sahni, Fundamentals of Data Structure, Galgotia Publication Private Limited., New Delhi.

BCA-S303: Computer Networks

UNIT-I

Protocol Architecture: Overview: Communication model, Communication Tasks, Data Communication Networking: WAN, LAN,Wireless Networks. Basics of Network Software: Protocol and protocol architecture, Protocol functions, Design Issues for the layers, interfaces &Services, Connection oriented and connectionless services, service primitives, relationship of services to protocols , ISO REF Models, TCP/IP Model.

Data Communications: Data Transmission: Concepts of Frequency, Spectrum, bandwidth, Electromagnetic spectrum and frequencies for data communication, Fourier analysis , Data and signal, Transmission impairments, channel capacity, Nyquist bandwidth, Shannon capacity formula ,decibels and signal strength, Transmission media: Coaxial, twisted pair, Comparative study of Categories of cables, Coaxial, Optical Fibers, Wireless transmission: Terrestial Microwave, satellite, Broadcast Radio,Infrared,.

UNIT-II

Data Encoding: (Brief idea of NRZ, Bipolar AMI, B8ZS, HDB3, ASK, FSK, PSK, PCM, AM, FM, PM), Spread Spectrum. Asynchrous and Synchronous transmission, Full and Half duplex, Interfacing, Functional and Procedural aspects of V.24,

Data Link Control: Flow control: Stop and Wait, Sliding window, Error detection: Parity Check,CRC. Error control: Stop and Wait ARQ, Go back-N ARQ, Selective-Reject ARQ, Brief idea of HDLC and other Data Link control protocols

UNIT-III

Circuit Switching: Simple switching Network, Circuit Switching Networks, Brief idea of following (detail working) not required:

Circuit Switching Concepts: Space Division switching, Time Division Multiplexing, Routing in circuit switching Networks, Control Signalling, Inchannel & common channel signaling, brief idea of SS7. Packet Switching: Packet switching principles, Routing, X.25

UNIT-IV

LAN Technology: LAN architecture, IEEE 802 standards, Ethernet (CSMA/CD): Medium Access Control, 10Mbps, 100Mbps, Gigabit Ethernet. Brief survey of other LAN systems (Token ring,FDDI,ATM, Fiber channel). Wireless LANS, Bridges, Latest trends in LAN technologies

LAN Devices: Study of specifications of L2 and L3 switches, Structured cabling, passive components.

UNIT-V

Principles of Internetworking, connection less Internetworking, IP, IPv6, IP multicasting. Routing protocols, TCP, UDP, SNMP,SMTP and MIME, HTTP.

Recommended Books:

1. William Stallings: Data & Communications,Sixth Edition
2. A. S. Tanenbaum: Computer Networks\\

BCA -S304A: Business Organization and Management

UNIT – I

Business and Management: Business Meaning and Contents, Business as a system, Business Environment. Management Concept and Nature, Management Process, Basic function of Management, Management Level, Role of Manager, Management Principles (Henry fayol's principle of management, Taylor's Scientific Management) .

UNIT – II

Organizational Behaviour: Need of Understanding human behaviour in organization, Challenges and Opportunities for OB.
Management by Objective (MBO), Decision making process and models, Conflict Management, Strategies & Policies.

UNIT- III

Managing Personnel: HRM- Meaning and Functions, Man Power Planning, Job Analysis and Design, Training, Career Planning & Development.
Motivation Theories & Practices, Leadership Concept theories & Style, Compensation Management.

UNIT- IV

Marketing Management and Finance: Basic Concepts of Marketing, Nature & Scope of Marketing, Sales Promotion, Product Life Cycle, Marketing Information System (MIS) and Marketing Research.
Main Sources of Finance, Concept of Fixed & Working Capital, Introduction of Tax – Income Tax, Service Tax & VAT, Basic Concept of Invoice & Quotations.

UNIT- V

Case Study: IT & BPO Industry, HR & Finance, Case Study of Local Industry with around Hundred Employees,
Industry Visit, Project.

Recommended Books:

1. B.P. Singh & T.N. Chabbra, "Business Organization and Management Functions" , Dhanpat Rai & Co. 2000.
2. P.C Tripathi & P. N. Reddy, "Principles of Management", Tata McGraw Hill Publishing Company New Delhi.
3. L.M. Prasad, "Principles and Practices of Management".
4. Stephen P. Robbins, "Organizational Behaviour", (8th Ed.) Prentice Hall of India.
5. K. Aswathappa, "Human Resource Management", Tata McGraw Hill Publishing Company New Delhi.
6. Philip Kotler, "Marketing Management", (9th Ed.) Prentice Hall of India.
7. Ramaswamy. V.S. and Namakumari.S. "Marketing Management: Planning, Control." New Delhi, MacMillan. 1990.
8. Dr. S.N. Maheshwari, "Financial Management – Principles and Practices" (6th revised Ed.) S. Chand & Sons.

BCA- S304B: Numerical and Statistical Methods

UNIT-I

Roots of Equations: Graphical Method -Bisection Method - False-Position Method - Fixed-Point Iteration - Newton-Raphson Method Secant Method - Roots of Polynomials: Conventional Methods - Muller's Method - Bairstow's Method. Algebraic Equations: Gauss Elimination -Gauss-Jordan - LU Decomposition - Matrix Inverse -Gauss-Seidel.

UNIT-II

Numerical Differentiation - Integration: Trapezoidal Rule - Simpson's Rule - Romberg Integration - Differential equations: Taylor's method - Euler's method -Runge-Kutta 2nd and 4th order methods Predictor - corrector methods.

UNIT-III

Diagrammatic and Graphical representation of Numerical Data - Formation of frequency distribution - Histogram, Cumulative Frequency - Polygon and Ogives - Measures of central tendencies - Mean, Median, Mode - Measures of dispersion - Mean deviation, Standard deviation, variance, Quartile deviation and coefficient of variation - Moments (upto 4th) - Measures of Skewness and Kurtosis for grouped and ungrouped data.

UNIT-IV

Sample space - Events - Definition of probability - combinatorial problems - conditional probability and independence - Random variables, distributions and Mathematical expectations - Discrete distributions - Binomial - Poisson - Continuous distributions - Normal and Exponential distributions - Moments and Moment generating functions.

UNIT-V

Correlation and Regression analysis: product moment correlation -coefficient - rank correlation coefficient - simple regression - method of least squares for estimation of regression coefficient. Concept of sampling and Sampling distributions - Sampling from Normal distributions - Standard error - Tests of significance - Large sample test for population mean and proportions - Test for populations means: single - two sample and paired t - test - Chi square tests for goodness of fit and test for independence of attributes in contingency table.

Recommended Books:

1. Snedecor G.W. and Cochran W.G. (1989): Statistical methods, 8 ed., Affiliated East West.
2. Trivedi K.S. (1994): Probability and Statistics with Reliability, Queueing and computer Science applications, Prentice Hall of India.
3. Balaguruswamy E. (1988): Computer oriented Statistical and Numerical methods, Macmillan India Ltd.
4. S. C. Chopra and R. P.Canale - Numerical Methods for Engineers - Third Edition - McGraw Hill International Edition - 1998.
5. S. S. Sastri, Introductory Methods of Numerical Analysis, Prentice Hall

PRACTICAL

BCA- S305: Programming Lab

Practicals based on paper BCA- S302

BCA-S306: Database Lab

Practicals based on paper BCA - S301

AUDIT COURSE:

BCA- S307A/BCA-S307B: Elective Practical Laboratory for proficiency in any one of the following

1 .Web Design
2. Desk Top Publishing

BCA-S308: **Seminar**: Seminar topics to be allotted in the beginning of the course by issuing schedule of seminars including faculty seminars

Fourth Semester

BCA- S401: System Analysis and Design

UNIT-I

Introduction: System Concept and the need for system approach, Definition of system and system analysis, Factoring into subsystems, Black box system, Introduction to the basic elements of the system, Different types and behaviour of the system.

UNIT-II

The System Development Life Cycle and System Analyst: Source and inspiration of a new system development, Recognition and need, linear approach and prototype approach, Different phases in SDLC, Role of System Analyst.

UNIT-III

System Analysis: Importance of planning and control, Information Gathering: Various Methods, Tools of Structured Analysis: DFD, Decision Tree, Structured English, Decision Tables, Data Dictionary, Feasibility study. System Design: The Process of Design: Logical and Physical design, Methodologies: Structured, Form-Driven, IPO Charts etc., Input Output Form Design, File Organization: Sequential Indexed, inverted list, Database Design, Logical and Physical View of Data.

UNIT-IV

System Implementation: Need of Testing, Test Plan, Quality Assurance, Trends in Testing, Audit Trail, Post Implementation Review, Project Scheduling, Selection of Hardware and Software

UNIT-V

Security and Recovery in System Development: System Security: Definition, Threats to system security, Control measures, Disaster/ Recovery Planning, Ethics in System Development. Case Study.

Recommended books:

1. System Analysis and Design - E.M.Awad
2. System Analysis and Design - Dennis Wixom

BCA –S402: Fundamentals of Operating Systems

UNIT-I

Introduction: What is an operating system? Mainframe, desktop, multiprocessor, distributed, clustered, real-time and handheld systems.
Operating System Structures: System components, operating system services, system calls, systems programs, system structure, virtual machines.

UNIT-II

Process: Process concept, process scheduling, operations on processes, cooperating processes. Inter process communication.
CPU Scheduling: Basic concepts, scheduling criteria, scheduling algorithms, algorithm evaluation.

UNIT-III

Process Synchronization: The critical section problem, semaphores, classical problems of synchronization.

Deadlocks: Deadlock characterization, methods for handling deadlocks. Deadlock prevention, avoidance and detection. Recovery from deadlocks.

UNIT-IV

Memory Management: Swapping, contiguous memory allocation, paging, segmentation, segmentation with paging.

Virtual Memory: Demand paging, page replacement, allocation of frames, thrasing.

UNIT-V

Linux: History, design principles, kernel modules, process management, scheduling, memory management, file systems, input and output, inter process communication, network structure, security.

Recommended Books:
1. Silberschatz G.G., Operating System Concepts, John Wiley & Sons Inc.

BCA-S403: Object Oriented Programming using C++

UNIT – I

Different paradigms for problem solving, need for OOP, differences between OOP and procedure oriented programming, abstraction, overview of OOP principles- encapsulation, inheritance and data binding polymorphism, abstraction.

C++ basics: structure of a C++ program, data types, declaration of variables, expressions, operators, type conversions, pointers and arrays, strings, structures, references, flow control statement, functions-scope of variables, parameter passing, recursive functions, default arguments, inline functions, dynamic memory allocation and delocation operators.

UNIT – II

C++ classes and data abstraction: class definition, class structure, class objects, class scope, this pointer, static class members, constant member functions, constructors and destructors, dynamic creation and destruction of objects, friend function and class, static class member.

Overloading : function overloading, operator overloading – unary, binary operators.

UNIT - III

Inheritance: defining a class hierarchy, different forms of inheritance, defining the base and derived classes, access to the base class members, base and derived class construction, destructors, virtual base class.

Polymorphism: static and dynamic bindings, base and derived class virtual functions, dynamic binding through virtual functions, virtual function call mechanism, pure virtual functions, abstract classes, implications of polymorphic use of classes, virtual destructors.

UNIT - IV

Templates - function templates and class templates, overloading of function template, static class member in class template.

Exception handling: benefits of exception handling, throwing an exception, the try block, catching an exception, exception objects, exception specifications, rethrowing an exception, catching all exceptions.

UNIT-V

File handling : stream classes hierarchy, stream I/O, file streams, opening and closing data file, creating a data file, read and write functions, error handling during file operations, formatted I/O, sequential and random file processing.

Standard template library (STL): component of STL, containers, iterartors, algorithms, application of container classes.

Recommended books

1. Object Oriented Programming with C++: E. Balagurusamy
2. Tripathy PC And Reddy PN, "Principles of Management", Tata McGraw-Hill
3. B. P. Singh and T. N. Chabra , Management Concepts and Practices , Dhanpat Rai
4. W. S. Jawedkar: Management Information Systems, Tata McGraw-Hill
5. K. C. Laudon and J. P. Laudon, Management Information Systems, PHI

(BCA-404A) :Management and Information System

Unit I

Basic concepts of management: Introduction to Management: Meaning and definitions of management, Management – An art or science, Management As a Profession, Management Vs. Administration, Different schools of management thought – Behavioural and Scientific, Principles of Management, Managerial skills, Levels of Management

Functions of Management (Introductory ideas) – Planning, Organizing, Staffing, Directing, Controlling, Leadership, Decision making

Unit II

Motivation : Concept, Theories of Motivation : Maslow, Herzberg and McGregor, Financial and Non financial incentives.

Leadership : Concept, Functions of Leader, Leadership styles

Communication : Process, Communication channels and Barriers, Essentials of effective Communication

Decisions : Characteristics of Business decisions, Rational Decision Making and its problems, Herbort Simon Model of decision making, Types of Decisions

Staffing: Concept, Recruitment & Selection, Training & Development, Performance Appraisal

Unit III

Information : Definition, Attributes of Information, Classification of Information

Perspectives on Information System: What is an information system?, Dimensions of information system, Contemporary Approaches to information system : Technical approach, behavioral approach and socio technical approach .

Organizations and Information System: Impact of Information system on organizations: Economic Impact , Organizational and Behavioural Impact, Impact of IT on management decision making : How IT affects management decision making , The role of managers in Organizations, Models of Decision Making, Implications for the Design and understanding of Information system

Unit IV

Major Types of Systems in Organizations: Executive Support System (ESS) , Management Information System (MIS), Decision Support System (DSS) , Transaction Processing System (TPS).

Systems from a functional Perspective: Sales and Marketing Systems, Manufacturing and Production Systems, Finance and Accounting Systems, Human Resource Systems.

Management Information System: Definition, Role of MIS, Impact of MIS, Management as a control system, MIS : A Support to the management.

Development of MIS : Approaches to Development : Prototype Approach, Life Cycle Approach, Implementation of MIS

Unit V

Current Issues in Information Systems: E-commerce, Enterprise Resource Planning (ERP), Supply Chain Management (SCM), Customer Relationship Management (CRM), Expert System (ES) , Knowledge Management System (KMS)

Information Security Challenges in E- Enterprises : Introduction , Security Threats and Vulnerabilities , Controlling Security Threats and Vulnerabilities , Managing Security threat in E – Business, Disaster Management , MIS and security challenges

Recommended Books :

1. Tripathy PC And Reddy PN, "Principles of Management", Tata McGraw-Hill
2. B. P. Singh and T. N. Chabra , Management Concepts and Practices , Dhanpat Rai
3. W. S. Jawedkar: Management Information Systems, Tata McGraw-Hill
4. K. C. Laudon and J. P. Laudon, Management Information Systems, PHI

BCA-S404B: BUSINESS ACCOUNTING

UNIT-I

Introduction:Financial Accounting-Definition and scope, objectives of financial accounting, Accounting vs book keeping. Terms used in accounting, users of accounting, information and limitations of Financial Accounting

Conceptual Framework: Accounting Concepts, principles and conventions, accounting standards-concept, objectives, benefits, brief review of accounting standards I India. Accounting policies, Accounting as a measurement discipline, variation principles, accounting estimates**.**

UNIT-II

Recording of transactions: Voucher system, Accounting process, journals, subsidiary books,ledger,cash book, Bank reconciliation statement, trial balance. Depreciation: Meaning, need and importance of depreciation, methods of charging depreciation

UNIT-III

Preparation of final accounts: Preparation of trading and profit &Loss Account and Balance sheet of sole proprietary business

UNIT-IV

Introduction to Company Final Accounts: Important provisions of companies Act 1956 in respect of preparation of Final Accounts. Understanding of final accounts of a company.

UNIT-V

Computerised Accounting: Computers and financial application, Accounting software pacakages, an overview of computerized accounting system. Salinet features and significance, concept of grouping of accounts. Codification of accounts,maintaining hierarchy of ledger. Generating accounting reports.

PRACTICAL

Paper V: BCA- S405 OOPS LAB

Practical based on Paper-III

Paper VI: BCA- S406 LINUX & WINDOWS LAB

Practical based on Paper-II

Paper VII: BCA- 407A/407B Practical Electives (Choose One)

BCA 407A: ACCOUNTING SOFTWARE LAB
Professional training using TALLY
BCA 407B: ANIMATION LAB
Professional training on Animations

BCA-S408: **Seminar**: Seminar topics to be allotted in the beginning of the course by issuing schedule of seminars including faculty seminars

FIFTH SEMESTER

BCA-S501: Software Engineering

UNIT-I

Software Engineering Fundamentals: Definition of Software, Software characteristics, Software Applications.

Software Process: Software Process Models - Waterfall model, prototyping model, spiral model, incremental model, concurrent development model.

Project management Concepts: The Management Spectrum - The People , The Product , The Process , The Project.

UNIT-II

Software Process and Project Metrics: Measures, Metrics and Indicators, Software measurement: Size - Oriented Metrics, Function - Oriented Metrics, Extended Function point metrics

Software Project Planning: Project Planning Objectives, Software Project Estimation, and Decomposition Techniques - Problem Based Estimation, Process Based Estimation, Empirical Estimation Models- The COCOMO Model

Risk Analysis and Management: Software risks, Risk identification, Risk Projection, Risk Refinement, Risk Mitigation, Monitoring and Management.

UNIT-III

Software Quality Assurance: Basic concepts- Quality, Quality Control, Quality Assurance, Cost of Quality , Software Quality Assurance (SQA) , Formal Technical Review

Software Configuration Management: Baselines, Software Configuration Items, the SCM Process, Version Control, Change Control, Configuration Audit, Status Reporting.

Analysis Concepts and Principles: Requirements Elicitation for Software**, Analysis** Principles **-** The Information Domain, Modeling, Partitioning, Essential and Implementation Views, Specification: Specification Principles, Representation, The Software Requirement Specification (SRS)

UNIT-IV

Design Concepts and Principles: Design Principles, Design Concepts – Abstraction, Refinement, Modularity, Software Architecture, Control Hierarchy, Structural Partitioning, Data Structure, Software Procedure, Information Hiding, Effective Modular Design- Cohesion, Coupling

Software Testing: Testing Objectives & principles, Unit Testing, Integration Testing (Top Down Integration , Bottom Up Integration , Regression Testing, Smoke Testing), Validation Testing (Alpha and Beta Testing), System Testing (Recovery Testing, Security Testing, Stress Testing, Performance Testing).

UNIT-V

Reengineering: Software Reengineering, Reverse Engineering, Restructuring, Forward Engineering

CASE Tools: What is CASE, Building Blocks of CASE, A Taxonomy of CASE Tools, Integrated CASE Environments, The Integration Architecture and The CASE Repository.

Recommended Books:

1. R. Pressman: Software Engineering, McGraw-Hill.
2. K.K. Agrawal and Y. Sing: Software Engineering, New Age International.
3. P. Jalote: Software Project Management in Practice, Pearson.

BCA-S502: JAVA Programming

UNIT-I

Introduction to Java: Bytecode, features of Java, data types, variables and arrays, operators, control statements.

Objects & Classes: Object Oriented Programming, defining classes, static fields and methods, object construction

UNIT-II

Inheritance: Basics, using super, method overriding, using abstract classes, using final with inheritance.

Packages and Interfaces: Defining a package, importing package, defining an interface, implementing and applying interfaces.

UNIT-III

Exception Handling: Fundamentals, exception types, using try and cache.

Multithreaded Programming: Creating a single and multiple threads, thread priorities, synchronization.

UNIT-IV

Applets: Applets basics, applets architecture, applets skeleton, the html applet tag, passing parameters in applets.

Event Handling: Event classes and event listener interfaces.

UNIT-V

Graphic Programming Introduction to swings.

Recommended Books:

1. P. Naughton and H. Schildt: The complete reference to Java, Tata Mc-Graw Hill.
2. Deitel and Dietel: How to program in Java

BCA-S503: Web Technology

UNIT I

INTRODUCTION

History of the Internet and World Wide Web – HTML 4 protocols – HTTP, SMTP, POP3, MIME, IMAP. Introduction to JAVA Scripts – Object Based Scripting for the web. Structures – Functions – Arrays – Objects.

UNIT II

DYNAMIC HTML

Introduction – Object refers, Collectors all and Children. Dynamic style, Dynamic position, frames, navigator, Event Model – On check – On load – Onenor – Mouse rel – Form process – Event Bubblers – Filters – Transport with the Filter – Creating Images – Adding shadows – Creating Gradients – Creating Motion with Blur – Data Binding – Simple Data Binding – Moving with a record set – Sorting table data – Binding of an Image and table.

UNIT- III

MULTIMEDIA

Audio and video speech synthesis and recognition - Electronic Commerce – E-Business Model – E-Marketing – Online Payments and Security – Web Servers – HTTP request types – System Architecture – Client Side Scripting and Server side Scripting – Accessing Web servers – IIS – Apache web server.

UNIT -IV

DATABASE- ASP – XML

Database, Relational Database model – Overview, SQL – ASP – Working of ASP – Objects – File System Objects – Session tracking and cookies – ADO – Access a Database from ASP – Server side Active-X Components – Web Resources – XML – Structure in Data – Name spaces – DTD – Vocabularies – DOM methods.

UNIT- V

SERVLETS AND JSP

Introduction – Servlet Overview Architecture – Handling HTTP Request – Get and post request – redirecting request – multi-tier applications – JSP – Overview – Objects – scripting – Standard Actions – Directives.

Brief survey of Web 2.0 technologies, introduction to Semantic web and other current technologies

Recommended Books:

Deitel & Deitel, Goldberg, "Internet and world wide web – How to Program", Pearson Education Asia

REFERENCES

1. Eric Ladd, Jim O' Donnel, "Using HTML 4, XML and JAVA", Prentice Hall of India – QUE
2. Aferganatel, "Web Programming: Desktop Management", PHI
3. Rajkamal, "Web Technology", Tata McGraw-Hill,

BCA-504A: Network Management and Information Security

UNIT - I

Security and Cryptographic algorithm: Need for security, principle of security, types of attacks. Cryptographic techniques: cryptography terminology, substitution techniques, transposition techniques, Symmetric and asymmetric key algorithm, possible types of attack, key range, steganography. Symmetric vs asymmetric, algorithm types and modes, DES, double and triple DES, AES, comparison of various cryptographic algorithms and requirement of good cryptographic algorithm.

UNIT - II

Asymmetric cryptographic algorithm and Message Authentication: Public key cryptography principles and algorithms, RSA algorithm, Diffe-Hellman key exchange. One way hash functions, message digest, MD5, SHA1, message authentication code, Digital envelope and Digital signatures.

UNIT - III

Network Management: Management Standards and Models, configuration management, configuration database and reports, fault management, identification and isolation, protecting sensitive information, host and user authentication, structure of management information, Standard management information base, SNPv1 protocol, accounting management, performance management, network usage, matrics and quotas.

Network security: Overview of IPV4: OSI model, maximum transfer unit, IP, TCP, UDP, ICMP, ARP, RARP and DNS, ping, traceroute. Network attacks: Buffer overflow, IP scheduling, TCP session hijacking, sequence guessing. Network scanning: ICMP, TCP sweeps, basic port scans. Denial of service attacks: SYN flood, teardrop attacks, land, smurf attacks. Visual and private network topology: tunneling, IPSEC. Traffic protocols: authentication headers, ESP internet key exchange, security association PPTP, L2TP.

UNIT - IV

Web Security and Application Security: Web servers and browsers: security features, server privileges, active pages, scripting, security configuration setting for browsers, security of active content: JAVA, JAVA script, Active x, plug-ins, cookies. SSL & SET, security mail: PEM and PGP.

Firewalls: Firewall characteristics & design principles, types of firewalls, packet filtering router, application level gateway or proxy, content filters, bastion host. Firewall architectures: dual homed host, screening router, screened host, screened suvnet. Firewall logs.

UNIT - V

Instruction detection system: component of an IDS, placement of IDS components, types of IDS: network based IDS, file integrity checkers, host based IDS, IDS evaluation parameters.

Recommended book:

William Stallings: Network Security Essentials

BCA-504B: Client Server Computing

UNIT-1

Overview: definition, history, myths, transition to client server computing, database architectures, advantages and disadvantages of client server architecture.

Components : client, server, network, role and services of client-server, selection of operating system as client & server, types of client & servers, connectivity, peer-to-peer communication

Middle-ware : definition, role, 2 tier v/s 3 tiers, network file system, network operating system, API, RPC model & implementation

UNIT-II

Communication in client-server: Using OSI layer, TCP/IP networks.

Client/Server processing and application development: transaction processing, remote processing, distributed processing, distributed databases, development tools

UNIT-III

Distributed Objects: CORBA architecture and services, COM, DCOM, Java-RMI

Database Drivers: ODBC driver, JDBC driver.

Linking and Embedding: OLE and DDE

UNIT-IV

Data warehousing: operational data & analytical data, characteristics, architecture, Data warehouse options.

Oracle as database server: Memory architecture, Process architecture

Introduction to PL/SQL Programming: Data types, Control statements, cursors, triggers, exception handling, procedure and functions

UNIT-V

Managing C/S Applications: network management, database backup, database recovery, Data integrity, Data security.

Latest technology and tools used for Client Server Computing

Text/Reference books:

1. Client server Computing: Patrick Smith
2. Client Server survival guide, 3 rd Edition: Robert Orfali
3. Client server unleashed

BCA -S505: JAVA Programming Lab
Practical based on paper BCA 502

BCA- S506: Minor project
Based on Web Technology

BCA- S507: Practical on any one of the following

BCA-S507A Microsoft .NET Programming Lab
BCA-S507B Advanced Web Tools

BCA-S508: **Seminar**: Seminar topics to be allotted in the beginning of the course by issuing schedule of seminars including faculty seminars

SIXTH SEMESTER

Paper - I :(BCA -S601) Project Work

Only the projects submitted by the candidates as per following guidelines will be evaluated.

1. Project to be selected by the student at the end of fifth Semester
2. The project must be of approximately 400 man hours and so certified by the supervisor of the project
3. The project must be submitted in the form in consonance with the format enclosed
4. Monthly progress report must be submitted through supervisor in the enclosed format.
5. Project must be submitted before the prescribed last date.
6. Candidates are required to make a presentation of their project work during their project examination
7. Students who are Projects graded as unsatisfactory will give one more chance to undertake another project under another supervisor /organization.
8. The project work of the candidates whose monthly progress report is not submitted will be considered as incomplete and may be terminated within two weeks from the prescribed due date.
9. Students will be allowed to undertake project works only at the bonafide organizations.
10. Students are required to give two seminars during the project work, one at the end of 2nd month and another at the end of 4th month. However, candidates working for their project in organizations outside the state need to give only one seminar during the entire project period.
11. Examination of the project work will be conducted by a committee consisting of at least two internal examiners and one external examiner.

Guidelines for Project in partial fulfillment of the requirement of BCA course

(a) The project will consist of two parts:
- Documentation; and
- Viva-voce

(b) The source-code and the executable code have to be submitted on CD and student must demonstrate working of the software.

(c) Project shall be original and not copied from the existing material from any source and a certificate, as per format given will be provided with the Project, duly countersigned by the supervisor.

(d) Project will be submitted only when the candidate completes all papers though he or she may start the projects earlier.

(e) Presentation of the Project will be in the accepted norms; as laid down in various text-books; IEEE standard/ ISO standards etc., are some models to follow.

(f) As far as possible, the Project should be of real life value.

(g) Though the Project is given 480 hours, the student is expected to use his/her discretion to ensure that it is large enough to be of practical value.

(h) The number of hours will not include the hours for writing and documentation of the Project.

(i) During the presentation of the Project at via-voce the candidate is advised to have a computer based or an overhead project presentation material handy.

PERFORMA FOR CERTIFICATE

This is to certify that this is a bonafied record of the Project entitled _____ was done satisfactory at _____ by Mr./Ms _____ in partial fulfillment of BCA course. He/ She has successfully completed all the subjects.

This report had not been submitted for any other examination and does not form part of any other course undergone by the candidate.

PLACE:

DATE: SIGNATURE

NAME:
DESIGNATION:

(Name & Seal of organization of Supervisor)

PROFORMA FOR THE PROJECT REPORT

1. Title of the Project
2. Objectives
3. Input to the Project
4. Output generated
5. Details of Hardware Platform used
6. Details of Software Tools used
7. Implementation Issues (Clearly defining the area of Application).
8. Miscellaneous
9. Signature of the Candidature.

GUIDELINES FOR THE CHAPTERS AND SECTIONS

1. Microscopic Summary
2. Details of candidate and Supervisor along with certificates of :
    - Original Work;
    - Assistance if any;
    - Credits.
3. Aims and Objectives
4. Approach to Project and Time Frame
5. Project Design Description with Appendices to cover:
    - Flow Charts/Data Flow Diagram-Macro/Micro level
    - Source Code
    - Hardware Platform
    - Software Tools
    - Security measures
    - Quality Assurance
    - Auditability

6. Test Data and Result.

The project report must be prepared for the external examination. Monthly report of the students must be taken to monitor progress and must be placed for evaluation by external examiner. Projects submitted by the students shall be evaluated during external evaluation to ensure independent contribution and proficiency acquired by the students.

Note: Students must be allotted projects in the beginning of the session. Candidates submitting ready made projects/copied/ projects developed by professionals in the market etc shall be awarded zero marks.

Two copies of the project report and the software developed must be submitted to the external examiner. One copy of the project shall be returned to the student with the signature of external examiner.