Rama University Uttar Pradesh, Kanpur

Faculty of Engineering & Technology

Study & Evaluation Scheme

Bachelor of Computer Application (Computer Science & Engineering)

[Applicable w.e.f. Academic Session 2014-15 till Revised]

FACULTY OF ENGINEERING & TECHNOLOGY

RAMA UNIVERSITY, UTTAR PRADESH, KANPUR

Website: www.ramauniversity.ac.in

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Ref: RU/FET/BCA/BOS/2014/001 **Dated: 17-May-2014**

Faculty of Engineering & Technology

Department of Computer Science & Engineering

Minutes of Meeting

Boards of Studies

A meeting of Boards of Studies of Computer Science & Engineering (BCA) held on 17-May-2014 in Director Office. The following members were present:

1. Dr. Vivek Srivastava - Chairperson
2. Mr. Sarvesh Kumar - Member
3. Mr. Somendra Tripathi - Member
4. Ms. Neelu Kushwaha - Member

The following members agreed to review the minutes in Delhi.

1. Dr. Amod Tiwari - External Member
2. Mr. Vishal Nagar - External Member

Agenda:

1. Action Taken Report (ATR) on the basis of feedback from Stack holder/External member.

The BOS committee confirmed the minutes of the BOS meeting held on 17-May-2014

The department teams have been implemented the curricula and syllabus and consider their feedback and suggestion of stack holder/External member. They suggested that the focus must be on fundamental and practical courses having emphasis on research and development

2. **To consider and approve the Evaluation Scheme and Syllabus.**

S. No.	Item No.	Existing	Recommendation /Action Taken
1	**RU/FET/BCA/BOS/2014/001**	....	The BOS considered the Evaluation Scheme and Syllabus and discussed the credit of each course should be reflected in detailed syllabus of every subject. The BOS committee suggested following : 1. The provision of Departmental Electives in every Even Semester and VII Semester. 2. The provision of Mini Project, Seminar, Seminar Departmental, Industrial Training and Major Project for better exposure and employability. The BOS committee recommended Evaluation Scheme and

			Syllabus considering all the suggestions made in the meeting with their course code and subject codes.

3. Question Paper Format

4. Any other issue with the permission of the Chair: ----

The meeting concluded with a vote of thanks to the chair.

Date of the Next Meeting: to be decided and conveyed later

Chairperson

Signature: .....

Name : Dr. Vivek Srivastava

Date :

Internal Members

Signature: 1..... 2.....

Name: Mr. Sarvesh Kumar Mr. Somendra Tripathi

Date:

Signature: 3.....

Name: Ms. Neelu Kushwaha

Date:

External Members

Signature: 1..... 2.....

Name: Dr. Amod Tiwari Mr. Vishal Nagar

Date:

Encl.: Recommended Curricula attached for consideration and approval.

CC:

1. Dean

2. Registrar Office

Program Educational Objectives

At Rama University Computer Science and Engineering program will prepare its graduates to:

PEO-1: Graduates would demonstrate analytical and design skills including the ability to generate creative solutions and foster team-oriented, professionalism through effective communication in their careers.

PEO-2: Graduates would expertise in successful careers based on their understanding of formal and practical methods of application development using the concept of computer programming languages and design principles in national and international level.

PEO-3: Graduates would pursue advanced education, research and development moreover other creative and innovative efforts in Computer Application, as well as other professional careers.

PEO-4: Graduates would implement their exhibiting critical thinking and problem solving skills in professional practices or tackle social, technical and business challenges.

PEO-5: Graduates would illustrate effective work conventionalities and be able to adapt as well as accept to the challenges of a dynamic job environment.

Program Specific Outcomes

PSO-1: To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications.

PSO-2: To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors.

PSO-3: Analyze and synthesis computing systems through quantitative and qualitative techniques.

PSO-4: Accept cross cultural, social, professional, legal and ethical issues prevailing in local and global industry.

Program Outcomes:

The main outcomes of the BCA (CSE) program are given here. At the end of the program a student shall be able:

PO-1: Acquire Knowledge of mathematical foundations, computer application theory and algorithm principles in the design and modeling of computer based system.

PO-2: Understand the basic concepts to identify, analyze, design and perform experiments for proficient interpretation of results and practices in the core of latest technologies.

PO-3: Expertise to get the knowledge of relevant fields in other faculties such as humanities, performing arts, social sciences etc. can have greatly and effectively influence which inspires in evolving new scientific theories and inventions.

PO-4: Own Skills of observations and drawing logical inferences from the scientific experiments and develop application programs to meet the desired results including attainable constraints such as social, economical, environmental, functional, technological.

PO-5: Gain exposure in solve interpersonal, social issues, preventive, ethical hacking, forensic security technologies.

PO-6: Attain potential to participate in functions professionally in multi-disciplinary teams with positive attitude and an ability to tackle and interact the audiences.

PO-7: Demonstrate flair by participating in various social and cultural activities voluntarily, in order to spread knowledge, creating awareness about the technical and non-technical events.

PO-8: Earn caliber to design, analyze and development principles in the construction of complex hardware and software computer systems.

PO-9: Attain in-depth knowledge and sustained learning leading to futuristic trends, innovation & research to fulfill global interest.

PO-10: Exhibit clarity on both conceptual and application-oriented skills of Computing for higher studies in Post Graduate programs.

PO-11: Learn to design innovative solutions for solving real life business problems and addressing business development issues with a passion for quality competency and holistic approach.

PO-12: Implement document solutions to significant computational problems and apply mathematical and scientific reasoning to a variety of computational problems for the research in the computer application field.

ORDINANCE, RULES, REGULATIONS

for

Bachelor of Computer Application

1. Title

This ordinance shall be called as "The Rama University Uttar Pradesh, Faculty of Engineering &Technology Ordinance Governing Four years BCA Degree Course"

2. Duration of the Course

2.1 Total duration of the B.C.A. Course shall be 3 years, each year comprising of two semesters. Each semester shall normally have teaching for the 90 working days or as prescribed by UGC from time to time.

2.2 A candidate, who has failed twice in first year due to any reason (either due to his/her non-appearance or he/she being not permitted to appear in semester examinations) shall not be allowed to continue his/her studies further subject to clause 17.

2.3 The course of study shall be by regularly attending the requisite number of lectures, tutorials and practical training.

2.4 The 3rd and 5th semesters shall ordinarily be from 1st July to 31stDecember; however, the First semester shall ordinarily begin from 1st August. The remaining semesters shall be from 1st January to till 30th June subject to change, if any notified by the Vice Chancellor and other competent authorities; from time to time. The periods are inclusive of the time for examinations.

3. Medium of Instruction

The medium of instruction and examination shall be in English only.

4. Number of seats

Number of students to be admitted each year and the number of batches shall be decided and notified by the University from time to time; based upon the Rules, instructions and Notifications issued by UGC.

5. Admission

5.1. Admission to Bachelor of Computer Application (B.C.A.) First year in Ist semester will be made as per the rules prescribed by the Academic Council of the Rama University, Kanpur.

ORDINANCE, RULES, REGULATIONS

for

Bachelor of Computer Application

1. Title

This ordinance shall be called as "The Rama University Uttar Pradesh, Faculty of Engineering &Technology Ordinance Governing Four years BCA Degree Course"

2. Duration of the Course

2.1 Total duration of the B.C.A. Course shall be 3 years, each year comprising of two semesters. Each semester shall normally have teaching for the 90 working days or as prescribed by UGC from time to time.

2.2 A candidate, who has failed twice in first year due to any reason (either due to his/her non-appearance or he/she being not permitted to appear in semester examinations) shall not be allowed to continue his/her studies further subject to clause 17.

2.3 The course of study shall be by regularly attending the requisite number of lectures, tutorials and practical training.

2.4 The 3rd and 5th semesters shall ordinarily be from 1st July to 31stDecember; however, the First semester shall ordinarily begin from 1st August. The remaining semesters shall be from 1st January to till 30th June subject to change, if any notified by the Vice Chancellor and other competent authorities; from time to time. The periods are inclusive of the time for examinations.

3. Medium of Instruction

The medium of instruction and examination shall be in English only.

4. Number of seats

Number of students to be admitted each year and the number of batches shall be decided and notified by the University from time to time; based upon the Rules, instructions and Notifications issued by UGC.

5. Admission

5.1. Admission to Bachelor of Computer Application (B.C.A.) First year in Ist semester will be made as per the rules prescribed by the Academic Council of the Rama University, Kanpur.

5.2. Admission on migration of a candidate from any other University to the University is permitted.

6. Eligibility for Admissions:

6.1. Admission to B.C.A. First Year:

Candidates who have passed Intermediate of U.P. Board or (10+2) standard from other board with Physics and Mathematics as compulsory subject along with one of the following subjects: Chemistry/Computer Science is eligible for admission to first year of 3 year B.C.A. Courses offered by Faculty of Engineering and Technology, Rama University, Kanpur.

7. Procedure for Admission

At the relevant time admission to the course shall be governed by The Acts, Statutes and Ordinances in force and issued by the University. Admission to the Course shall be made strictly on the basis of the merit of the Entrance Test.

Provided that while making admission to the course reservation policy of the Government of Uttar Pradesh governing admission to higher educational Institutions issued from time to time shall be applied

8. Fee

A student shall pay the fee prescribed by the University from time to time

9. Attendance

9.1 Every student is required to attend all the lectures, tutorials, practicals and other prescribed curricular and co-curricular activities. The attendance can be condoned up to 25% on medical grounds or for other genuine reasons beyond the control of students.

9.2 A further relaxation of attendance up to 10% for a student can be given by Dean provided that he/she has been absent with prior permission of the Head of Department for the reasons acceptable to him. Vice Chancellor may further condone attendance shortage up to 5% on genuine grounds. However, under no circumstances, a student with an attendance of less than 60% in a subject shall be allowed to appear in the semester-end examination of that subject. Provided that the late admitted students in the first semester of any course maintain at least 80% attendance (including medical and other reasons) from the date of their admission.

9.3 No student will be allowed to appear in the end semester examination if he / she do not satisfy the overall average attendance requirements of Clause Nos. 9.1, and 9.2 and such candidate(s) shall be treated as having failed and will be further governed by clause no. 2.2.

9.4 The attendance shall be counted from the date of admission in the college or start of academic session whichever is later.

Sarvesh

10. Make-up Policy

Any student who misses any component of evaluation for genuine reasons must directly approach the instructor- in- charge/ instructor with a request for make-up examination stating the reasons, prior to the commencement of the examination. If the instructor-in-charge is satisfied with the request, he may arrange as soon as possible a make-up examination for the component of evaluation which the student had missed. If, on rare occasion, a student anticipates a genuine difficulty in meeting the date of the component of evaluation, he should take his instructor-in-charge/instructor into confidence prior to the event. The decision of the instructor-in-charge in all matters of make-up shall be final.

11. Curriculum:

11.1 The 3 year curriculum has been divided into 6 semesters and shall include lectures, tutorials, practicals, seminars and projects etc. in addition to industrial training and educational tour etc. as defined in the scheme and executive instructions issued by the University from time to time.

11.2 The curriculum will also include such other curricular, co-curricular and extra- curricular activities as may be prescribed by the University from time to time.

12. Teaching

The objective of classroom education is to awaken the curiosity of the student, generate habits of rational thinking in him, gear his mind to face the unfamiliar and train him to stand on his own. Classroom instruction helps the student in the organization and correlation of facts, comprehension of ideas and the creative use of knowledge.

The teacher also has the additional responsibility to make the student search for knowledge on his own and induce him to use additional facilities like the library, laboratory and the environment, to optimize his learning process. Self-study by the student would therefore form an important factor in the planning of teaching and evaluation. The student is required to cooperate and respond to this challenge.

Every course whether single-section or multi-section is conducted by a member of the faculty called instructor-in-charge, with the assistance, wherever necessary, of the required number of instructors who will be partners with him in meeting the full academic perceptions and organizational needs of teaching the course and evaluating the students. Wherever the instructor-in-charge is mentioned hereafter, it connotes the team of instructors, acting as one entity under his captainship.

The instructor-in-charge should make a comprehensive plan in respect of conducting the course even before the semester begins. In a multi-section course, all instructors must remain in continuous interaction in order to ensure a smooth operation of the course. While recognizing variations due to personal attitudes and styles, it is important that these are smoothened out so that the operation and grading in different sections in a course, indeed between courses across the faculty, are free from any seeming arbitrariness.

At the beginning of class work, the instructor, in-charge/instructor must announce to his class/ section through a Course Handout/Lesson Plan, the necessary information in respect of (i) the operations of the course (its pace, coverage and level of treatment, textbooks and other reading assignments, home tasks etc); (ii) various components of evaluation, such as tutorials, laboratory exercises, home assignment, several quizzes/tests/examinations (announced or unannounced, open book or closed book), regularity of attendance, etc. (iii) the frequency, duration, tentative schedule, relative weightage etc., of these various components; (iv) the broad policy which governs decisions about make-up; (v) mid-semester grading; (vi) grading procedure (overall basis, review of border line cases, effect of class average etc.) vii) Chamber consultation hours and (viii) other matters found desirable and relevant.

13. Examination:

13.1 The performance of a student in a semester shall be evaluated through continuous evaluation and end semester examination. The continuous evaluation shall be based on Mid Term Examination, assignments/tutorials, quizzes/viva-voce and attendance. The marks for continuous evaluation (Sessional marks) shall be awarded at the end of the semester. The end semester examination shall be comprised of written papers, practicals and viva-voce, inspection of certified course work in classes and laboratories, project work, design reports or by means of any combination of these methods.

13.2 The distribution of marks for sessional, end semester theory papers, practicals and other examinations, seminar, project, industrial training shall be as prescribed.

13.3 The marks obtained in a subject shall consist of marks allotted in end semester theory paper, practical examination and sessional work.

13.4 The minimum pass marks in each theory subject (including sessional marks) shall be 40% with a minimum of 30% marks in each theory paper in the end semester examination. If there is no provision of sessional marks in any subject, the minimum pass marks in that subject shall be 30% in the end semester examination.

13.5 The minimum pass marks in a project/practical subject (including sessional marks if any) shall be 50%.

13.6 A candidate, in order to pass, must secure 50% marks in the aggregate in a particular academic year inclusive of both semesters of the academic year.

13.7 The minimum pass marks in Seminar, Industrial Training and Educational Tour, Viva-Voice etc shall be 50%.

14. Evaluation Feedback

Just as evaluation is done in continuous manner, feedback should also be available in a continuous manner. Thus, the answer scripts must be promptly evaluated, shown to the students for them to obtain any clarification on their performance and returned to the students whenever practical. The performance of the students in the examination should be discussed in the class giving as much details as possible like the highest, lowest and average performances. Solutions with marking schemes are displayed soon after a test.

15. Promotion:

15.1 A candidate satisfying all the requirements under clause 15 shall be promoted to the next academic year of study.

15.2. (a) A candidate shall be eligible for provisional promotion to the next academic year of study provided:

(i) He/she fails to satisfy the requirements of clause 13.4, 13.5 and 13.7 in not more than 6 theory subject and 2 practical/ project subjects on the basis of combined result of both semester examinations of a particular academic year.

(ii) He/she fails to satisfy the requirements of clause 13.4, 13.5 and 13.7 (theory and/or practical/ project subjects) in not more than 6 theory subjects and 2 practical/project subjects in addition he/she fails to satisfy requirement of clause 13.6 (aggregate marks) in the combined result of both semester examinations of a particular academic year. In such a case aggregate marks shall be treated as one theory subject.

(b) If a candidate satisfies the requirement of clauses 13.4, 13.5 & 13.7 but fails to satisfy the requirement of clause 13.6, he/she shall be eligible for provisional promotion with carry over. He/she may choose up to a maximum of any four theory papers of that particular academic year as per his/her choice to pass the examination of that year.

15.3 A candidate shall not be promoted to third year unless he/she passes all the subjects of first year. Similarly, a candidate shall not be promoted to fourth year unless he/she passes all the examinations of second year.

15.4 All other candidates who do not satisfy conditions laid down in clause 13 shall be declared fail and shall be required to repeat the whole academic year after taking re- admission. This facility is, however, subject to the time limits stipulated in clause-2.

16. Carryover System:

16.1(a) A candidate who satisfies the requirements of clause 15.2 (a) will be required to appear in those theory papers / practicals in which he/she failed. However, a candidate of first year will be allowed to appear in the second semester examination in those theory/ practical subjects in which he/she failed in the first semester examination, provided examination of those theory/practical subjects are held in second semester.

(b) A candidate satisfying clause 15.2 (b) shall be required to exercise his/her choice up to a maximum of Six theory papers in which he/she desires to appear in the examination to fulfill the requirements of clause 13.6. He/she shall inform the college about his/her choice within 15 days after the start of new session.

16.2 The highest marks secured in any subject in various attempts (end semester and carryover examinations) shall be considered.

17. Ex-studentship:

17.1A candidate opting for ex-studentship shall be required to appear in all the theory & practical subjects in the end semester examinations of both semesters of the same academic year. However, the marks pertaining to Sessional, Industrial Training, and Seminar shall remain the same as those secured earlier.

17.2 A candidate opting for ex-studentship shall be required to apply to the faculty of Engineering and Technology by paying only examination fee within 15 days from the start of new session.

18. Re-admission:

A candidate may be allowed for re-admission provided he/she satisfies one of the following conditions:

18.1 A candidate is declared fail.

18.2 A candidate did not appear in a semester examination / or he/she was not granted permission to appear in the examination.

18.3 A candidate has been detained by the department and subsequently has been permitted to take re-admission.

18.4 A candidate as an ex-student passed the examination of the academic year or qualified for carryover system.

18.5 A candidate promoted with carry over subjects and he/she opted for re- admission.

19. Results:

19.1The result of a candidate shall be declared on the basis of performance of both semesters of the same academic year. However, a final year student, who is not permitted in any one of the final year semester examinations due to shortage of attendance, will be permitted in that particular semester of the next academic session to study as a regular student and appear at that semester examination.

20. Award of Division: The division shall be awarded on the basis of final year result.

20.1 Calculation of Grade Point and Grade Point Average

Relative grading shall be adopted at the Faculty of Engineering & Technology, Rama University. The list of letter grades, the grade points associated with them are given below:

Grade	Grade Point
A^+	10
A	9
B	8
C	7
D	6
E	5
F	4

In order to arrive at alphabet grades, the total marks in a particular course for all the students pursuing the course are tabulated in the descending order (equivalently a histogram).

The performance of the course is analyzed in terms of the highest, lowest and the average marks and the dividing lines between the clusters of students. Gaps and dips between the clusters and the nature of the clusters guide in drawing the dividing lines between the grades. In a normal class of large size, the C grade usually covers the average performance. This is, however not a hard and fast rule and exceptions may arise in case of small classes, skewed histogram etc. Borderline cases may be considered individually on the basis of regularity and the attendance, class room discussions, progressive good performance throughout the semester, etc.

20.2 Calculation System of Semester Grade Point Average:

- Computation of the Semester Grade Point Average (SGPA) and Cumulative Performance Index (CPI):

  The SGPA is an indicator of the overall academic performance of a student in all the courses he/she has registered during a given semester. It is computed as follows: If the grades awarded to a student are G_1, G_2 etc in courses with corresponding credits C_1, C_2 etc, the SGPA is given by:

$$SGPA = \frac{C_1 \times G_1 + C_2 \times G_2 + \cdots + C_n \times G_n}{C_1 + C_2 + \cdots + C_n}$$

- The CPI indicates the overall academic performance of a student in all the courses registered up to and including the latest completed semester/summer term. It is computed in the same manner as the SGPA, considering all the courses (say, n) and is given by:

$$CPI = \frac{\sum_{i=1}^{n} C_i \times G_i}{\sum_{i=1}^{n} C_i}$$

- Percentage conversion of CPI :

$$Percentage\ of\ marks = CPI \times 10$$

- Students should get a minimum grade E in each subject with 5CPI to clear the semester.
- CPI conversion

≥8 CPI	**I division with honours**
≥6 CPI	**I division**
≥5 CPI	**II division**
<5 CPI	**Fail**

20.3 If a candidate passes all examinations in first attempt without grace and secures 8CPI or more marks, he/she shall be placed in FIRST DIVISION WITH HONOURS and the candidates at first two top positions amongst First Div. with Honours only will be awarded medals viz. Gold and Silver respectively in order of merit.

21. Award of Rank:

On the basis of final year result, the top ten candidates in each branch shall be awarded rank according to their merit provided they pass all the examinations in first attempt.

22. Grace Marks:

22.1 A candidate may be awarded grace marks up to a maximum of total 15 marks, in maximum five subjects but not more than three marks in any subject including theory papers, practicals, project, seminar, industrial training and/ or aggregate marks in each academic year provided he/she can be declared to have passed the academic year by the award of these marks.

22.2 The grace marks shall not be added to the aggregate marks.

23. Reports

At the end of the course, in certain situations, the instructor-in-charge may report certain events/facts in suitable words, in place of grades discussed earlier. These reports are not to be construed as grades. The various reports listed below are elaborated in the subsequent clauses.

- Incomplete (I)
- Grade Awaited (GA)
- Withdrawn (W)
- Registration Cancelled (RC), Required to Register (RR), Discontinued from the Program (DP)
- Not Cleared (NC)

Incomplete (I)

If the instructor-in-charge finds a student having not fulfilled some of the requirements of a course before the final deadline for transmitting the grade, and he is satisfied that he is able to transmit some grade or a report with or without this particular fulfillment, but at his discretion wishes to give the student an opportunity, he may, within the deadline, send a report 'I' (Incomplete) and also inform the student of the same. It shall be the responsibility of the student to contact the instructor-in-charge in time for replacement of the 'I' report within two weeks after the end of the semester (and within one week after the end of summer term, for a summer term course) which the instructor-in-charge will communicate whatever grade/report is possible for the situation. Whenever such relaxation is made, the Dean/Director will specify at his discretion, with the consent of the instructor-in-charge, the date by which 'I' report has to be converted.

The requirement envisaged in the above clause must be completed within the time allowed. If the extra time given goes beyond the registration in the next semester/term, registration in the next semester/term, is not possible. The student in such a situation should seek permission to stay away as per the above clause

Grade Awaited (GA)

There are many situations where operational and practical difficulties may cause a delay in the communication of a grade. Certain situations which are visualized in this connection are: (i) where a case of unfair means is pending; (ii) where a case of indiscipline is pending, and (iii) where the courses are being conducted at an off campus centre for IP students, where precise co-ordination between the Institute and these centers may not work in a timely manner. In these circumstances the Dean may authorize the instructor-in-charge to report GA (Grades Awaited).

A student may also get a "GA" report if he has, due to a genuine reason not been able to appear for an examination on the scheduled date and his request for make-up has been granted. In such a case, the student should ensure by the end of the term that either:

- He takes the make-up examination and convert the "GA" report onto a letter grade or
- He makes an application to the Dean/Director, through Instructor in Charge to convert "GA" report into a "NC" report.

Whenever the report GA appears in the grade sheet, a student will not be allowed to register for the subsequent semester, until the student takes steps to convert "GA" report into a letter grade or "NC" report.

Withdrawn (W)

A student may seek withdrawal from the course(s) in a semester for any of the following reasons:

- The student is unable to register for the course(s) for a genuine reason.
- The student is unable to cope up with the normal load and withdraws from the course(s) to reduce his academic load for a particular semester.

The request for withdrawal should be made to the Dean of the faculty, within two weeks of the commencement of the semester in case of (i) above and within the stipulated duration as specified in the academic calendar in the case of (ii) In such cases the grade sheet/transcript of the student will indicate 'W' (Withdrawn against the course(s) from which the student has withdrawn his registration. The student will have to register for the course(s) when it is offered next and obtain a valid letter grade. If the course with 'W' report is a prerequisite course for another course, the registration to the course is possible only on obtaining a valid letter grade in the prerequisite course with 'W' report. If the withdrawal is made after the due date, the event will be reported as "RC" or "DP" as the case may be.

Registration Cancelled (RC) or Required to Register (RR) or Discontinued from the Programme (DP)

If a student's registration for a course has to be cancelled, this fact will be reported in the grade sheet as RC (Registration Cancelled). Registration would be cancelled and an RC is issued in the following cases:

- Cancellation is recommended as a part of disciplinary action for resorting to unfair means during examination or other unprofessional behaviour.
- Cancellation is recommended due to less than the minimum required percentage of attendance.
- Cancellation is recommended if a provisionally admitted student fails to submit the proof of necessary documents required for registration and/or does not satisfy the minimum eligibility requirements for the admission within the prescribed time limit.
- Cancellation is recommended when a student persistently and/or deliberately does not pay his dues.

RC itself has many meanings and may be reported as the following:

- When it is clearly known that the student will be required to register again in the same course, the event will be reported as RRA (Required to Register Again).
- If RC amounts to discontinuation from the program it will be reported as DP (Discontinued from the Program)
- If the cancellation of registration is not reported either as RRA or as DP but is reported as RC, it does not necessarily mean that it is free from any constraint. The meaning of the constraint has to be construed from the context in which the RC is reported.

Not Cleared (NC)

If a student continued to remain registered in a course but gave the instructor inadequate opportunity to evaluate him by absenting himself from quizzes/tests/examinations/other components of evaluation, or by appearing in the same for the sake of appearance without applying himself to the task in hand or by submitting a blank script (answer book), these events would be reported as NC (Not Cleared).

Whenever a student gets a NC report in a course irrespective of whether he has a grade in the course or not earlier to this event, the following will govern further action. It is to be noted that a NC cannot be ignored, except under the situations described below:

- Whenever a student gets a NC report in a course which is in the compulsory package of his program, he is required to register again in the some course and get a valid grade therein.
- If a student has a NC report in a course taken as elective, he can either repeat the course to get a valid grade or ignore it to choose another course. However, a student must get valid grades in at least the prescribed number of electives in his program.
- Whenever a student's record has an NC in a course which remains unaccounted after a process of transfer has been completed it will not be possible for him to wipe out the NC report in such a course because this course is not a part of his program anymore; and he can graduate with this NC.
- If a student is reported NC in a project course, it will be administratively converted to RC by the Dean and future registration in project courses will be done only if the Dean is satisfied with the genuineness of the candidate's interest in the course.

If a student is reported NC in Thesis or Seminar, he will be required to register in the same for one more semester. Operationally, this is to be achieved by requiring him to register once again in as

many units of Thesis or Seminar in which he had registered when he was awarded NC. If these two courses get separated due to NC in one of them, there is no need to register in the other.

24. Grade Sheet

A student's grades, reports, CGPA, etc., at the end of every semester/term will be recorded on a grade sheet, a copy of which will be issued to him. The grade sheet will be withheld when a student has not paid his dues or when there is a case of breach of discipline or unfair means pending against him.

While registration with approval of appropriate authority consistent with these regulations is a token of permission to pursue studies, the grade sheet is a complete record of the outcome of what was intended in the original/amended/ revised registration. The various grades and reports discussed above would be appropriately used to tally the grade sheet with original/ amended/revised registration. It would be evident that this tally between what was registered for and what was obtained in terms of grades and reports will apply to all courses except the course, which was originally registered for, but subsequently replaced by another course through substitution.

The tally is made on a course basis at the end of semester/term to determine which of the courses have been cleared. A course is deemed to have been cleared if the student obtains a grade in the course. However, mere clearing of the prescribed courses does not tantamount to fulfilling the requirements of graduation.

While all the grades secured and other pertinent information for semesters are given in a grade sheet, the chronologically organized information from the grade sheets of a student with the necessary explanation constitutes his transcript which is issued at the time he leaves the Institute or at an intermediate point on request.

25. Scrutiny and Revaluation:

25.1 Scrutiny shall be allowed in three theory papers.

25.2 Revaluation of theory/practical papers is not permitted.

26. Unfair means:

Cases of unfair means shall be dealt as per the rules of the University and The U.P. Public Examination (Prevention of Unfair means) Act if any in prevalence.

27. Award of Sessional Marks:

Sessional marks for theory subjects, practicals and project shall be awarded as will be prescribed and at present the break-up of sessional marks shall be as follows:

Evaluation Scheme:

- **Course without practical components**

For Continuous Evaluation (CE) is such as: 20 Marks

1. Attendance: 5 Marks
2. Assignments/Quiz / Seminar/Term paper /Project :15Marks

MTE - Mid Term Examination: 20 Marks

a. First Mid Term Examination: 10 marks
b. Second Mid Term Examination: 10 marks

ETE - End Term Examination: 60 Marks

- **Course with practical components only**

For Continuous Evaluation (CE) is such as: 30 Marks
Conduct / Perform/Execution /Practical File/ Viva-Voice

MTE - Mid Term Examination: 20 Marks

a. First Mid Term Examination: 10 marks
b. Second Mid Term Examination: 10 marks

ETE - End Term Examination: 50 Marks

Make-up test may be held only for those students who could not appear in any one of mid-term class tests due to genuine reasons for which the prior permission from the Head of Department was taken. Make up test shall ordinarily be held about two weeks before the semester examination. The syllabus for the make-up test shall be the whole syllabus covered by the subject teacher up to that time.

28. Award of Seminar, Industrial Training, Educational Tour Marks at Department level:

28.1 The marks Colloquium/summer industrial training Report shall be awarded on the following basis

Criteria	**Internal**	**External**	**Total**
Project Report	20	40	60
Viva Voce	30	60	90
Total	50	100	150

28.2 The marks of Major project shall be awarded on the following basis:

Criteria	**Internal**	**External**	**Total**
Project Report	100	200	300
Viva Voce	100	100	200
Total	**200**	**300**	**500**

Sarvesh

28.3 The marks in Seminar, Industrial Training and Educational Tour shall be awarded by a committee consisting of following members:

(i) Head of the Department or his/her nominee.

(ii) Concerned Officer – In-charge.

(iii) Senior Faculty Member of the department nominated by the Head of Department.

29. Cancellation of Admission:

The admission of a student at any stage of study shall be cancelled if:

(i) He / She is not found qualified as per UGC/AICTE / State Government norms and guidelines or the eligibility criteria prescribed by the University.

or

(ii) He / She is found unable to complete the course within the stipulated time as prescribed in clause 4.2

or

(iii) He / She are found involved in creating indiscipline in the Faculty of Engineering & Technology or in the University.

30. The Academic Council shall have the power to relax any provision provided in the ordinance in any specific matter/situation subject to the approval of Executive Council of the University & such decision(s) shall be reported to the Chancellor of the University.

Assessment Criteria (B.C.A.)

All courses of B.C.A. shall be evaluated by 100 marks. The subject shall be evaluated by 100 marks, out of which 40 marks shall be internal assessment and 60 marks for external assessment. Internal Assessment for 40 marks shall be as per the criteria given below:

Criteria	**Marks**
First Mid Term Examination	10
Second Mid Term Examination	10
Assignments/ Quiz / Seminar/Term paper /Project	15
Attendance	5
Total Internal Assessment	**40**

Marks for Attendance shall be awarded as per the criteria given below:

Attendance Percentage	**Marks**
91% to 100%	5
81% to 90%	4
71% to 80%	3
61% to 70%	2
51% to 60%	1

All students should have a minimum of 75% attendance in all subjects, in order to appear in the end term examination / viva voce. The 75% criterion includes all leaves of absence – whether approved or not approved.

Students failing to obtain 75% attendance shall be required to repeat the course in the subsequent year, along with the next batch, to make up for the shortage of attendance.

Under extraordinary circumstances, a student with attendance below 75% shall be allowed to appear in the term exams / viva voce. This will be at the discretion of the Vice Chancellor of the University.

Circumstances when such leniency shall be shown include:

a. Death of a blood relative – father, mother, grandfather, grandmother, brother or sister.
b. Extreme cases of health adversity requiring hospitalization of the student.

In such cases, the student shall be required to give a written application to the Vice Chancellor of the University, along with appropriate proof. In case of death of blood relative, an application from the parent(s) shall be considered.

All faculty members shall maintain appropriate records and make them available to the University's examination centre at the end of the semester.

Credit System

The B.C.A. Program has a total of 150 credits and students are required to complete all courses. On completion of all courses, the students shall earn 150 credits and would be eligible for award of the B.C.A. Degree.

Summer Industrial Training (B.C.A.)

Each student shall undergo practical training of six to eight weeks during the vacations after the fourth semester. The students are required to prepare three copies of their project reports of which two have to be submitted to the Faculty. The reports shall be submitted within two weeks of commencement of the fifth semester. The report shall carry 150 marks, out of which 100 shall be evaluated by an External Examiner appointed by the University while the remaining 50 marks shall be evaluated by a Board of Internal Examiners(minimum two) appointed by the Dean, Faculty of Engineering & Technology. The summer training Project shall be evaluated in the following manner:

Criteria	**Internal**	**External**	
Project Report	30	-	
Viva Voce	20	50	
Total	50	50	100

External evaluation will be conducted during fifth end semester practical exam.

Final Year Major Project Report (B.C.A.)

During the sixth semester, each student shall undertake a project to be pursued by him / her under the supervision of a guide/supervisor. The guide/supervisor shall be appointed by the Dean, Faculty of Engineering & Technology. Minimum four copies of project report along with one soft copy in a CD shall be submitted at least two weeks prior to the commencement of the 6th End Term Examination. The major project report of 500 marks and shall be evaluated by a Board of Internal & External Examiners. The Board shall consist of a minimum of two Internal Faculty Members supervisor shall be appointed by the Dean, Faculty of Engineering & Technology and External Examiner shall be appointed by the University. The major project report shall be evaluated in the following manner:

Criteria	Internal	External	Total
Project Report	100	100	200
Viva Voce	100	100	200
Total	200	200	400

Note:

From 2nd year onwards, students will take up **BHU-001 (Human Values & Professional Ethics) and Disaster management** as an audit subject. The student shall have to clear this audit subject with minimum E grade during 2nd Year to Final Year but its grade shall not be considered in SGPA/CPI. However, a student may opt more than two audit subject (with approval of Dean) for which shall not be compulsion to clear the subject, and the grade of these subjects shall not be considered in SGPA/ CPI.

Calculation of Grade Point and Grade Point Average

Relative grading shall be adopted at the Faculty of Engineering & Technology, Rama University. The list of letter grades, the grade points associated with them are given below:

Grade	Grade Point
A^+	**10**
A	**9**
B	**8**
C	**7**
D	**6**
E	**5**
F	**4**

In order to arrive at alphabet grades, the total marks in a particular course for all the students pursuing the course are tabulated in the descending order (equivalently a histogram).

The performance of the course is analysed in terms of the highest, lowest and the average marks and the dividing lines between the clusters of students. Gaps and dips between the clusters and the nature of the clusters guide in drawing the dividing lines between the grades. In a normal class of large size, the C grade usually covers the average performance. This is, however not a hard and fast rule and exceptions may arise in case of small classes, skewed histogram etc. Borderline cases may be considered individually on the basis of regularity and the attendance, class room discussions,

progressive good performance throughout the semester, etc.

Calculation System of Semester Grade Point Average:

- Computation of the Semester Grade Point Average (SGPA) and Cumulative Performance Index (CPI):

  The SGPA is an indicator of the overall academic performance of a student in all the courses he/she has registered during a given semester. It is computed as follows: If the grades awarded to a student are G_1, G_2 etc in courses with corresponding credits C_1, C_2 etc, the SGPA is given by:

$$SGPA = \frac{C_1 \times G_1 + C_2 \times G_2 + \cdots + C_n \times G_n}{C_1 + C_2 + \cdots + C_n}$$

- The CPI indicates the overall academic performance of a student in all the courses registered up to and including the latest completed semester/summer term. It is computed in the same manner as the SGPA, considering all the courses (say, n) and is given by:

$$CPI = \frac{\sum_{i=1}^{n} C_i \times G_i}{\sum_{i=1}^{n} C_i}$$

- Percentage conversion of CPI:

$$Percentage\ of\ marks = CPI \times 10$$

- Students should get a minimum grade E in each subject with 5 CPI to clear the semester.
- CPI conversion

≥8 CPI	**I division with honours**
≥6 CPI	**I division**
≥5 CPI	**II division**
<5 CPI	**Fail**

- In case a student gets a F grade in more than one subject, he / she has to repeat one or more of the subjects by registering for "Guided Study" in that semester. Registration for Guided Study shall be made on the payment of Rs. 500 per subject as well as registering for the examination with a payment of Rs. 1000 per subject.
- If the students get F grade in six theory subjects in an academic session, then he/ she will repeat the year.
- Whenever a student is permitted to repeat, the new grade with star will replace the old grade and computation of the SGPA will done by considering the new grade.

- B.C.A. Course should be completed within Five years. If a student does not complete the B.C.A. program in Five years, he / she will have to appear in the program as a fresh.

Rama University Uttar Pradesh, Kanpur

Faculty of Engineering & Technology

Course Detail and Evaluation Scheme
BCA First Year (Computer Science & Engineering)
(Effective from the Session 2014-15)

Semester-I

S.N.	Subject Code	Subject Name	Period			Evaluation Scheme			Total Marks	Credit
			L	T	P	CE	MTE	ETE		
Theory subjects										
1	BCA-101	Computer Fundamental & Office Automation	3	1	0	20	20	60	100	4
2	BCA-102	Programming Principle & Algorithm	3	1	0	20	20	60	100	4
3	BCA-103	Principle of Management	3	1	0	20	20	60	100	4
4	BCA-104	Business Communication	3	1	0	20	20	60	100	4
5	BCA-105	Mathematics-I	3	1	0	20	20	60	100	4
Practical / Project										
6	BCA-151	Office Automation Lab	0	0	4	30	20	50	100	2
7	BCA-152	Programming Lab	0	0	4	30	20	50	100	2
		Total	**15**	**5**	**8**	**160**	**140**	**400**	**700**	**24**

L-Lecture, T-Tutorial, P- Practical, CE- Continuous Evaluation, MTE-Mid Term Examination, ETE-End Term Examination

Evaluation Scheme:

- **Course without practical components**

For Continuous Evaluation (CE) is such as: 20 Marks

1. Attendance: 5 Marks
2. Assignments/ Quiz / Seminar/Term paper /Project :15Marks

MTE - Mid Term Examination: 20 Marks

a. First Mid Term Examination: 10 marks
b. Second Mid Term Examination: 10 marks

ETE - End Term Examination: 60 Marks

- **Course with practical components only**

For Continuous Evaluation (CE) is such as: 30 Marks
Conduct / Perform/Execution /Practical File/ Viva-Voice

MTE - Mid Term Examination: 20 Marks

a. First Mid Term Examination: 10 marks
b. Second Mid Term Examination: 10 marks

ETE - End Term Examination: 50 Marks

Rama University Uttar Pradesh, Kanpur

Faculty of Engineering & Technology

Chairperson

Signature: .....

Name : Dr. Vivek Srivastava

Date :

Internal Members

Signature:

1..... 2.....

Name: Mr. Sarvesh Kumar Mr. Somendra Tripathi

Date:

Signature: 3.....

Name: Ms. Neelu Kushwaha

Date:

External Members

Signature:

1..... 2.....

Name: Dr. Amod Tiwari Mr. Vishal Nagar

Date:

Rama University Uttar Pradesh, Kanpur

Faculty of Engineering & Technology

Course Detail and Evaluation Scheme
BCA First Year (Computer Science & Engineering)
(Effective from the Session 2014-15)
Semester-II

S.N.	Subject Code	Subject Name	Period			Evaluation Scheme			Total Marks	Credit
			L	T	P	CE	MTE	ETE		
Theory Subjects										
1	BCA-201	'C' Programming	3	1	0	20	20	60	100	4
2	BCA-202	Digital Electronics & Computer Organization	3	1	0	20	20	60	100	4
3	BCA-203	Organization Behavior	3	1	0	20	20	60	100	4
4	BCA-204	Financial Accounting & Management	3	1	0	20	20	60	100	4
5	BCA-205	Mathematics-II	3	1	0	20	20	60	100	4
Practical / Project										
6	BCA-251	'C' Programming Lab	0	0	4	30	20	50	100	2
7	BCA-252	Computer Organization Lab	0	0	4	30	20	50	100	2
		Total	**15**	**5**	**8**	**160**	**140**	**400**	**700**	**24**

L-Lecture, T-Tutorial, P- Practical, CE- Continuous Evaluation, MTE-Mid Term Examination, ETE-End Term Examination

Evaluation Scheme:

- **Course without practical components**

For Continuous Evaluation (CE) is such as: 20 Marks

3. Attendance: 5 Marks
4. Assignments/ Quiz / Seminar/Term paper /Project :15Marks

MTE - Mid Term Examination: 20 Marks

a. First Mid Term Examination: 10 marks
b. Second Mid Term Examination: 10 marks

ETE - End Term Examination: 60 Marks

- **Course with practical components only**

For Continuous Evaluation (CE) is such as: 30 Marks
Conduct / Perform/Execution /Practical File/ Viva-Voice

MTE - Mid Term Examination: 20 Marks

a. First Mid Term Examination: 10 marks
b. Second Mid Term Examination: 10 marks

ETE - End Term Examination: 50 Marks

Rama University Uttar Pradesh, Kanpur

Faculty of Engineering & Technology

Chairperson

Signature: .....

Name : Dr. Vivek Srivastava

Date :

Internal Members

Signature:

1..... 2.....

Name: Mr. Sarvesh Kumar Mr. Somendra Tripathi

Date:

Signature: 3.....

Name: Ms. Neelu Kushwaha

Date:

External Members

Signature:

1..... 2.....

Name: Dr. Amod Tiwari Mr. Vishal Nagar

Date:

Rama University Uttar Pradesh, Kanpur

Faculty of Engineering & Technology

Course Detail and Evaluation Scheme
BCA Second Year (Computer Science & Engineering)
(Effective from the Session 2015-16)

Semester-III

S.N.	Subject Code	Subject Name	Period			Evaluation Scheme			Total Marks	Credit
			L	T	P	CE	MTE	ETE		
Theory Subjects										
1	BCA-301	Object Oriented Programming with 'C++	3	1	0	20	20	60	100	4
2	BCA-302	Data Structure Using 'C'	3	1	0	20	20	60	100	4
3	BCA-303	Computer Architecture & Assembly Language	3	1	0	20	20	60	100	4
4	BCA-304	Business Economics	3	1	0	20	20	60	100	4
5	BCA-305	Mathematics-III	3	1	0	20	20	60	100	4
Practical / Project										
6	BCA-351	Object Oriented Programming with 'C++ Lab	0	0	4	30	20	50	100	2
7	BCA-352	Data Structure Using 'C' Lab	0	0	4	30	20	50	100	2
		Total	**15**	**5**	**8**	**160**	**140**	**400**	**700**	**24**

*BHU-001 Human Values & Professional Ethics (Audit Course) - Student can clear from 2nd year to Final year

L-Lecture, T-Tutorial, P- Practical, CE- Continuous Evaluation, MTE-Mid Term Examination, ETE-End Term Examination

Evaluation Scheme:

- **Course without practical components**

For Continuous Evaluation (CE) is such as: 20 Marks

5. Attendance: 5 Marks
6. Assignments/ Quiz / Seminar/Term paper /Project :15Marks

MTE - Mid Term Examination: 20 Marks

a. First Mid Term Examination: 10 marks
b. Second Mid Term Examination: 10 marks

ETE - End Term Examination: 60 Marks

- **Course with practical components only**

For Continuous Evaluation (CE) is such as: 30 Marks
Conduct / Perform/Execution /Practical File/ Viva-Voice

MTE - Mid Term Examination: 20 Marks

a. First Mid Term Examination: 10 marks
b. Second Mid Term Examination: 10 marks

ETE - End Term Examination: 50 Marks

Rama University Uttar Pradesh, Kanpur

Faculty of Engineering & Technology

Chairperson

Signature: .....

Name : Dr. Vivek Srivastava

Date :

Internal Members

Signature:

1..... 2.....

Name: Mr. Sarvesh Kumar Mr. Somendra Tripathi

Date:

Signature: 3.....

Name: Ms. Neelu Kushwaha

Date:

External Members

Signature:

1..... 2.....

Name: Dr. Amod Tiwari Mr. Vishal Nagar

Date:

Rama University Uttar Pradesh, Kanpur

Faculty of Engineering & Technology

Course Detail and Evaluation Scheme
BCA Second Year (Computer Science & Engineering)
(Effective from the Session 2015-16)
Semester-IV

S.N.	Subject Code	Subject Name	Period			Evaluation Scheme			Total Marks	Credit
			L	T	P	CE	MTE	ETE		
Theory Subjects										
1	BCA-401	Introduction to Computer Graphics & Multimedia	3	1	0	20	20	60	100	4
2	BCA-402	Operating System	3	1	0	20	20	60	100	4
3	BCA-403	Software Engineering	3	1	0	20	20	60	100	4
4	BCA-404	Optimization Techniques	3	1	0	20	20	60	100	4
5	BCA-405	Elements of Statistics	3	1	0	20	20	60	100	4
Practical / Project										
6	BCA-451	Computer Graphics	0	0	4	30	20	50	100	2
7	BCA-452	Operating System	0	0	4	30	20	50	100	2
		Total	**15**	**5**	**8**	**160**	**140**	**400**	**700**	**24**

*BHU-001 Human Values & Professional Ethics (Audit Course) - Student can clear from 2nd year to Final year

L-Lecture, T-Tutorial, P- Practical, CE- Continuous Evaluation, MTE-Mid Term Examination, ETE-End Term Examination

Evaluation Scheme:

- **Course without practical components**

For Continuous Evaluation (CE) is such as: 20 Marks

7. Attendance: 5 Marks
8. Assignments/ Quiz / Seminar/Term paper /Project :15Marks

MTE - Mid Term Examination: 20 Marks

a. First Mid Term Examination: 10 marks
b. Second Mid Term Examination: 10 marks

ETE - End Term Examination: 60 Marks

- **Course with practical components only**

For Continuous Evaluation (CE) is such as: 30 Marks
Conduct / Perform/Execution /Practical File/ Viva-Voice

MTE - Mid Term Examination: 20 Marks

a. First Mid Term Examination: 10 marks
b. Second Mid Term Examination: 10 marks

ETE - End Term Examination: 50 Marks

Rama University Uttar Pradesh, Kanpur

Faculty of Engineering & Technology

Chairperson

Signature: .....

Name : Dr. Vivek Srivastava

Date :

Internal Members

Signature:

1..... 2.....

Name: Mr. Sarvesh Kumar Mr. Somendra Tripathi

Date:

Signature: 3.....

Name: Ms. Neelu Kushwaha

Date:

External Members

Signature:

1..... 2.....

Name: Dr. Amod Tiwari Mr. Vishal Nagar

Date:

Rama University Uttar Pradesh, Kanpur

Faculty of Engineering & Technology

Course Detail and Evaluation Scheme
BCA Third Year (Computer Science & Engineering)
(Effective from the Session 2016-17)
Semester-V

S.N.	Subject Code	Subject Name	Period			Evaluation Scheme			Total Marks	Credit
			L	T	P	CE	MTE	ETE		
Theory Subjects										
1	BCA-501	Introductions to DBMS	3	1	0	20	20	60	100	4
2	BCA-502	Java Programming & dynamic web page design	3	1	0	20	20	60	100	4
3	BCA-503	Introduction Computer Networks	3	1	0	20	20	60	100	4
4	BCA-504	Numerical Methods	3	1	0	20	20	60	100	4
Practical / Project										
5	BCA-551	DBMS Lab	0	0	4	30	20	50	100	2
6	BCA-552	JAVA Lab	0	0	4	30	20	50	100	2
7	BCA-553	Summer Training	0	0	0	--	--	100	100	4
		Total	**12**	**4**	**8**	**140**	**120**	**440**	**700**	**24**

*BHU-001 Human Values & Professional Ethics (Audit Course) - Student can clear from 2nd year to Final year

L-Lecture, T-Tutorial, P- Practical, CE- Continuous Evaluation, MTE-Mid Term Examination, ETE-End Term Examination

Evaluation Scheme:

- **Course without practical components**

For Continuous Evaluation (CE) is such as: 20 Marks

9. Attendance: 5 Marks
10. Assignments/ Quiz / Seminar/Term paper /Project :15Marks

MTE - Mid Term Examination: 20 Marks

a. First Mid Term Examination: 10 marks
b. Second Mid Term Examination: 10 marks

ETE - End Term Examination: 60 Marks

- **Course with practical components only**

For Continuous Evaluation (CE) is such as: 30 Marks
Conduct / Perform/Execution /Practical File/ Viva-Voice

MTE - Mid Term Examination: 20 Marks

a. First Mid Term Examination: 10 marks
b. Second Mid Term Examination: 10 marks

ETE - End Term Examination: 50 Marks

Rama University Uttar Pradesh, Kanpur

Faculty of Engineering & Technology

Chairperson

Signature: .....

Name : Dr. Vivek Srivastava

Date :

Internal Members

Signature:

1..... 2.....

Name: Mr. Sarvesh Kumar Mr. Somendra Tripathi

Date:

Signature: 3.....

Name: Ms. Neelu Kushwaha

Date:

External Members

Signature:

1..... 2.....

Name: Dr. Amod Tiwari Mr. Vishal Nagar

Date:

Rama University Uttar Pradesh, Kanpur

Faculty of Engineering & Technology

Course Detail and Evaluation Scheme
BCA Third Year (Computer Science & Engineering)
(Effective from the Session 2016-17)

Semester-VI

S.N.	Subject Code	Subject Name	Period			Evaluation Scheme			Total Marks	Credit
			L	T	P	CE	MTE	ETE		
Theory Subjects										
1	BCA-601	Computer Network Security	3	1	0	20	20	60	100	4
2	BCA-602	E-Commerce	3	1	0	20	20	60	100	4
Practical / Project										
3	BCA-651	Major Project	0	0	4	200	-	200	400	12
4	BCA-652	Colloquium	0	0	2	50	-	50	100	4
		Total	**6**	**2**	**6**	**290**	**40**	**370**	**700**	**24**

*BHU-001 Human Values & Professional Ethics (Audit Course) - Student can clear from 2nd year to Final year

L-Lecture, T-Tutorial, P- Practical, CE- Continuous Evaluation, MTE-Mid Term Examination, ETE-End Term Examination

Evaluation Scheme:

- **Course without practical components**

For Continuous Evaluation (CE) is such as: 20 Marks

11. Attendance: 5 Marks
12. Assignments/ Quiz / Seminar/Term paper /Project :15Marks

MTE - Mid Term Examination: 20 Marks

a. First Mid Term Examination: 10 marks
b. Second Mid Term Examination: 10 marks

ETE - End Term Examination: 60 Marks

- **Course with practical components only**

For Continuous Evaluation (CE) is such as: 30 Marks
Conduct / Perform/Execution /Practical File/ Viva-Voice

MTE - Mid Term Examination: 20 Marks

a. First Mid Term Examination: 10 marks
b. Second Mid Term Examination: 10 marks

ETE - End Term Examination: 50 Marks

Rama University Uttar Pradesh, Kanpur

Faculty of Engineering & Technology

Chairperson

Signature: .....

Name : Dr. Vivek Srivastava

Date :

Internal Members

Signature:

1..... 2.....

Name: Mr. Sarvesh Kumar Mr. Somendra Tripathi

Date:

Signature: 3.....

Name: Ms. Neelu Kushwaha

Date:

External Members

Signature:

1..... 2.....

Name: Dr. Amod Tiwari Mr. Vishal Nagar

Date:

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Computer Fundamental & Office Automation
BCA-101

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I

Introduction to Computers

Introduction, Characteristics of Computers, Block diagram of computer. Types of computers and features, Mini Computers, Micro Computers, Mainframe Computers, Super Computers.

Types of Programming Languages (Machine Languages, Assembly Languages, High Level Languages). Data Organization, Drives, Files, Directories. **Types of Memory** (Primary And Secondary) RAM, ROM, PROM, EPROM. **Secondary Storage Devices** (FD, CD, HD, Pen drive). **I/O Devices** (Scanners, Plotters, LCD, Plasma Display). **Number Systems** Introduction to Binary, Octal, Hexadecimal system Conversion, Simple Addition, Subtraction, Multiplication

8 Hours

UNIT-II

Algorithm and Flowcharts

Algorithm: Definition, Characteristics, Advantages and disadvantages, Examples Flowchart: Definition, Define symbols of flowchart, Advantages and disadvantages, Examples.

8 Hours

UNIT-III

Operating System and Services in O.S.

Dos – History, Files and Directories, Internal and External Commands, Batch Files, Types of O.S.

8 Hours

UNIT-IV

Windows Operating Environment

Features of MS – Windows, Control Panel, Taskbar, Desktop, Windows Application, Icons, Windows Accessories, Notepad, Paintbrush.

8 Hours

UNIT-V

Editors and Word Processors, Basic Concepts, Examples: MS-Word, Introduction to desktop publishing.

Spreadsheets and Database packages, Purpose, usage, command, MS-Excel, Creation of files in MS-Access, Switching between application, MS-PowerPoint.

Referential Books:

- Fundamental of Computers – By V.Rajaraman B.P.B. Publications
- Fundamental of Computers – By P.K. Sinha
- Computer Today- By Suresh Basandra
- Unix Concepts and Application – By Sumitabha Das
- MS-Office 2000(For Windows) – By Steve Sagman
- Computer Networks – By Tennenbum Tata MacGrow Hill Publication

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Programming Principle & Algorithm
BCA-102

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I

Introduction to 'C' Language

History, Structures of 'C' Programming, Function as building blocks. Language Fundamentals, Character set, C Tokens, Keywords, Identifiers, Variables, Constant, Data Types and Comments.

8 Hours

UNIT-II

Operators

Types of operators, Precedence and Associativity, Expression, Statement and types of statements, build in Operators and function.

Console based I/O and related built in I/O function: printf(), scanf(), getch(), getchar(), putchar(); Concept of header files, Preprocessor directives: #include, #define.

Control structures

Decision making structures: If, If-else, Nested If-else, Switch; Loop Control structures: While, Do-while, for, Nested for loop; other statements: break, continue, goto, exit.

8 Hours

UNIT-III

Introduction to problem solving Concept: problem solving, Problem solving techniques (Trail & Error, Brain Storming, Divide & Conquer), Steps in problem solving (Define Problem, Analyze Problem, Explore Solution), Algorithms and Flowcharts (Definitions, Symbols), Characteristics of an algorithm Conditionals in pseudo-code, Loops in pseudo code.

Time complexity: Big-Oh notation, efficiency Simple Examples: Algorithms and flowcharts (Real Life Examples)

8 Hours

UNIT-IV

Simple Arithmetic Problems

Addition / Multiplication of integers, Determining if a number is +ve / -ve / even / odd, Maximum of 2 numbers, 3 numbers, Sum of first n numbers, given n numbers, Integer division, Digit reversing, Table generation for n, a^b factorial, sine series, cosine series, ${}^nCr$, Pascal Triangle, Prime number, Factors of a number, Other problems such as Perfect number, GCD numbers etc (Write algorithms and draw flowchart), Swapping

UNIT-V

Functions

Basic types of function, Declaration and definition, Function call, Types of function, Parameter passing, Call by value, Call by reference, Scope of variable, Storage classes, Recursion.

Referential Books:

- Let us C-Yashwant Kanetkar.
- Programming in C-Balguruswamy
- The C programming Lang., Pearson Ecl - Dennis Ritchie
- Structured programming approach using C- Forouzah & Ceilber Thomson learning publication.
- Pointers in C – Yashwant Kanetkar
- How to solve it by Computer – R.G. Dromy
- Peter Norton's Introduction to Computers – Tata MGHill

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Principle of Management
BCA-103

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I

Nature of Management:

Meaning, Definition, its nature purpose, importance & Functions, Management as Art, Science & Profession- Management as social System Concepts of Management-Administration-Organization, Management Skills, Levels of Management.

8 Hours

UNIT-II

Evolution of Management Thought: Contribution of F.W.Taylor, Henri Fayol, Elton Mayo, Chester Barhard & Peter Drucker to the management thought. Business Ethics & Social Responsibility: Concept, Shift to Ethics, Tools of Ethics.

8 Hours

UNIT-III

Functions of Management: Part-I

Planning – Meaning- Need & Importance, types, Process of Planning, Barriers to Effective Planning, levels – advantages & limitations. Forecasting- Need & Techniques, Decision making-Types - Process of rational decision making & techniques of decision making, organizing – Elements of organizing & processes: Types of organizations, Delegation of authority – Need, difficulties, Delegation – Decentralization, Staffing – Meaning & Importance.

8 Hours

UNIT-IV

Functions of Management: Part-II

Motivation – Importance – theories, Leadership – Meaning –styles, qualities & function of leader, Controlling - Need, Nature, importance, Process & Techniques, Total Quality Management, Coordination – Need – Importance.

8 Hours

UNIT – V

Management of Change: Models for Change, Force for Change, Need for Change, Alternative Change Techniques, New Trends in Organization Change, Stress Management.

Referential Books:

- Essential of Management – Horold Koontz and Iteinz Weibrich- McGraw-Hill's International
- Management Theory & Practice – J.N.Chandan
- Essential of Business Administration – K. Aswathapa, Himalaya Publishing House
- Principles & practice of mana gement – Dr. L.M.Parasad, Sultan Chand & Sons – New Delhi
- Business Organization & Management – Dr. Y.K.Bhushan
- Management: Concept and Strategies by J.S. Chandan, Vikas Publishing
- Principles of Management, By Tripathi, Reddy Tata McGraw Hill
- Business organization and Management by Talloo by Tata McGraw Hill
- Business Environment and Policy – A book on Strategic Management/ Corporate Planning By Francis Cherunilam Himalaya Publishing House 2001 Edition

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Business Communication
BCA-104

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I
Means of Communication:
Meaning and Definition – Process – Functions – Objectives – Importance – Essentials of good communication – Communication barriers, 7C's of Communication.

8 Hours

UNIT-II
Types of Communication:
Oral Communication: Meaning, nature and scope – Principle of effective oral communication – Techniques of effective speech – Media of oral communication (Face-to-face conversation – Teleconferences – Press Conference – Demonstration – Radio Recording – Dictaphone – Meetings – Rumor – Demonstration and Dramatization – Public address system – Grapevine – Group Discussion – Oral report – Closed circuit TV). The art of listening – Principles of good listening.

8 Hours

UNIT-III
Written Communication
Purpose of writing, Clarity in Writing, Principle of Effective writing, Writing Techniques, Electronic Writing Process.
Business Letters & Reports:
Need and functions of business letters – Planning & layout of business letter – Kinds of business letters – Essentials of effective correspondence, Purpose, Kind and Objective of Reports, Writing Reports.

8 Hours

UNIT-IV
Drafting of business letters:
Enquiries and replies – Placing and fulfilling orders – Complaints and follow-up Sales letters – Circular letters Application for employment and resume

8 Hours

UNIT-V
Information Technology for Communication:
Word Processor – Telex – Facsimile(Fax) – E-mail – Voice mail –Internet – Multimedia – Teleconferencing – Mobile Phone Conversation – Video Conferencing –SMS – Telephone Answering Machine – Advantages and limitations of these types.
Topics Prescribed for workshop/skill lab Group Discussion, Mock Interview, Decision Making in a Group

Referential Books:

- Business Communication – K.K.Sinha – Galgotia Publishing Company, New Delhi.
- Media and Communication Management – C.S. Rayudu – Himalaya Publishing House, Bombay.
- Essentials of Business Communication – Rajendra Pal and J.S. Korlhalli- Sultan Chand & Sons, New Delhi.
- Business Communication (Principles, Methods and Techniques) Nirmal Singh – Deep &Deep Publications Pvt. Ltd., New Delhi.
- Business Communication – Dr.S.V.Kadvekar, Prin.Dr.C.N.Rawal and Prof.Ravindra Kothavade- Diamond Publications, Pune.

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Mathematics –I
BCA-105

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I
DETERMINANTS:
Definition, Minors, Cofactors, Properties of Determinants MATRICES: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Ad-joint, Inverse, Cramer's Rule, Rank of Matrix Dependence of Vectors, Eigen Vectors of a Matrix, Caley-Hamilton Theorem (without proof).

8 Hours

UNIT-II
LIMITS & CONTINUITY:
Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity at a Point, Continuity Over an Interval, Intermediate Value Theorem, Type of Discontinuities.

8 Hours

UNIT-III
DIFFERENTIATION:
Derivative, Derivatives of Sum, Differences, Product & Quotients, Chain Rule, Derivatives of Composite Functions, Logarithmic Diff eventuation, Rolle's Theorem, Mean Value Theorem, Expansion of Functions (McLaurin' s & Taylor's), Indeterminate Forms, L' Hospitals Rule, Maxima & Minima, Curve Tracing, Successive Differentiation & Leibnitz Theorem.

8 Hours

UNIT-IV
INTEGRATION:
Integral as Limit of Sum, Fundamental Theo rem of Calculus (without proof.), Indefinite Integrals, Methods of Integration Substitution, By Parts, Partial Fractions, Reduction Formulae for Trigonometric Functions, Gamma and Beta Functions(definition).

8 Hours

UNIT-V
VECTOR ALGEBRA:
Definition of a vector in 2 and 3 Dimensions; Double and Triple Scalar and Vector Product and physical interpretation of area and volume.

Referential Books:

- B.S. Grewal, "Elementary Engineering Mathematics", 34th Ed., 1998.
- Shanti Narayan, "Integral Calculus", S. Chand & Company, 1999
- H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Company, 9th Revised Edition, 2001.
- Shanti Narayan, "Differential Calculus", S. Chand & Company, 1998.

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Office Automation Lab
BCA-151

Credit-2

L	T	P
0	0	4

Content:

List of experiments

CYCLE-1 (MS-word & MS-EXCEL)

1. Features of office automation.
2. Creating a new document and perform the various formatting operation in MS-Word.
3. Create a mail merge operation using MS-Word.
4. Create a table using MS-Word.
5. Perform the paragraph alignment in MS-Word.
6. Create a work sheet in MS-Excel.
7. Create various charts in MS-Excel.
8. Perform statistical operations in MS-Excel.
9. Perform various text operations in MS-Excel.

CYCLE-II (MS-Access & MS-PowerPoint)

10. Create a mark sheet data base in MS-Access. 11.Creating a pay-bill database in MS-Access
11. Update a pay-bill database in MS-Access
12. Viewing a Pay-bill database in MS-Access.
13. Generating forms and reports in MS-Access.
14. Inserting pictures, clipart, audio and video slideshow using MS-PowerPoint.
15. Customizing Animation using MS-PowerPoint.EX.NO: 1 FEATURES OF OFF

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Programming Lab
BCA-152

Credit-2

L	T	P
0	0	4

Content:

EXPERIMENT-1
Overview of Turbo C++ IDE & GCC WAP to display a message "Hello World" on Standard Output

EXPERIMENT-2
Use of \n, \t and escape sequences, W.A.P to convert the temperature unit from Fahrenheit to Celsius using the formula C= (F-32) / 1.8, Assume that any month is of 30 days. Now you are given total days. Find out the exact number of Years, Months & Days You are given time in total seconds. Convert it into Hour: Min: Seconds format

EXPERIMENT-3
W.A.P to determine whether input number is ODD or Even. Display appropriate message
W.A.P that will display grad of student according to his/ her marks using if else ladder
W.A.P that computes and prints the Factorial of a given number
W.A.P that computes and prints the Fibonacci series

EXPERIMENT-4
W.A.P to print the different patterns
W.A.P to count Blanks, Tabs and Newlines using while and getchar
W.A.P for a calculator using do while
W.A.P to check whether the input number is prime or not
W.A.P to display even numbers between 2 to 20 without using the modulo operation

EXPERIMENT-5
Printline() which print '=' sign 81 times in the same line,
Write a function to calculate and display the total amount where total amount=p*(1+r)2
Modify above program for returning total amount

EXPERIMENT-6
Factorial of n using recursive function

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

'C' Programming
BCA-201

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I
Arrays
Definition, declaration and initialization of one dimensional array; Accessing array elements; Displaying array elements; Sorting arrays; Arrays and function; Two- Dimensional array: Declaration and Initialization, Accessing and Displaying, Memory representation of array [Row Major, Column Major]; Multidimensional array.

8 Hours

UNIT-II
Pointers
Definition and declaration, Initialization; Indirection operator, address of operator; pointer arithmetic; dynamic memory allocation; arrays and pointers; function and pointers

8 Hours

UNIT-III
Strings
Definition, declaration and initialization of strings; standard library function: strlen(), strcpy(), strcat(), strcmp(); Implementation without using standard library functions.

8 Hours

UNIT-IV
Structures
Definition and declaration; Variables initialization; Accessing fields and structure operations; Nested structures; Union: Definition and declaration; Differentiate between Union and structure.

8 Hours

UNIT-V
Introduction C Preprocessor
Definition of Preprocessor; Macro substitution directives; File inclusion directives; Conditional Compilation Bitwise Operators Bitwise operators; Shift operators; Masks; Bit field.

File handling
Definition of Files, Opening modes of files; Standard function: fopen(), fc lose(), feof(), fseek(), fewind();Using text files: fgetc(), fputc(), fscanf() Command line arguments.

Referential Books:

- Let us C-Yashwant Kanetkar.
- Programming in C-Balguruswamy
- The C programming Lang., Person Ecl – Dennis Ritchie
- Structured programming approach using C-Forouzah & Ceilberg Thomson learning publication.

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Digital Electronics & Computer Organization
BCA-202

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I

Logic gates and circuit

Gates (OR, AND, NOR, NAND, XOR & XNOR); Demogran's laws; Boolean laws, Circuit designing techniques (SOP, POS, K-Map).

8 Hours

UNIT-II

Combinational Building Blocks Multiplexes; Decoder; Encoder; Adder and Subtracted.

8 Hours

UNIT-III

Memories ROMs, PROMs, EPROMs, RAMs, Hard Disk, Floppy Disk and CD-ROM.

8 Hours

UNIT-IV

Sequential Building Blocks Flip-Flop (RS, D, JK, Master-slave & & T flip-flops); Registers & Shift registers; Counters; Synchronous and Asynchronous Designing method.

8 Hours

UNIT-V

Memory Organization: Basic cell of static and dynamic RAM; Building large memories using chips; Associative memory; Cache memory organization and Virtual memory organization.

Referential Books:

- 1. Digital Logic and Computer design (PHI) 1998 : M.M. Mano
- 2. Computer Architecture (PHI) 1998 : M.M. Mano
- 3. Digital Electronics (TMH) 1998 : Malvino and Leach
- 4. Computer Organization and Architecture : William Stallings
- 5. Digital fundamentals (Universal Book Stall) 1998 : Floyd, L.Thomas
- 6. Computer Organization (MC Graw-Hill, Signapore) : Hamcher, Vranesic and Zaky

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Organization Behavior
BCA-203

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I
Fundamentals of Organizational Behaviour Nature, Scope, Definition and Goals of Organizational Behaviour; Fundamental Concepts of Organizational Behaviour; Models of Organizational Behaviour; Emerging aspects of Organizational Behaviour: Meaning Cultural Diversity, Managing the Perception Process.

8 Hours

UNIT-II
Perception, Attitude, Values and Motivation Concept, Nature, Process, Importance, Management Behavioral aspect of Perception. Effects of employee attitudes; Personal and Organizational Values; Job Satisfaction; Nature and Importance of Motivation; Achievement Motive; Theories of Work Motivation: Maslow's Need Hierarchy Theory McGregor's Theory 'X' and Theory 'Y'

8 Hours

UNIT-III
Personality
Definition of Personality, Determinants of Personality; Theories of Personality- Trait and Type Theories, The Big Five Traits, Mytes-Briggs Indicator; Locus of Control, Type A and Type B Assessment of Personality.

8 Hours

UNIT-IV
Work Stress
Meaning and definition of Stress, Symptoms of Stress; Sources of Stress: Individual Level, Group Level, Organizational Level; Stressors, Extra Organizational Stressors; Effect of Stress – Burnouts; Stress Management – Individual Strategies, Organizational Strategies; Employee Counseling

8 Hours

UNIT-V
Group Behaviour and Leadership
Nature of Group, Types of Groups; Nature and Characteristics of team; Team Building, Effective Teamwork; Nature of Leadership, Leadership Styles; Traits of Effective Leaders. Conflict in Organizations Nature of Conflict,

Referential Books:

- Organizational Behavior Text, Cases and Games- By K.Aswathappa, Himalaya Publishing House, Mumbai, Sixth Edition (2005)
- Organizational Behavior Human Behavior at Work By J.W. Newstrom, Tata McGraw Hill Publishing Company Limited, New Delhi, 12th Edition (2007)
- Organizational Behavior – By Fred Luthans
- Organizational Behavior – By Super Robbins
- Organizational Behavior – Anjali Ghanekar

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Financial Accounting & Management
BCA-204

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I

Overview - Meaning and Nature of Financial Accounting, Scope of Financial Accounting, Financial Accounting & Management Accounting, Accounting concepts & convention, accounting standards in India.

8 Hours

UNIT-II

Basics of accounting – Capital & Revenue items, Application of Computer in Accounting Double Entry System, Introduction to Journal, Ledger and Procedure for Recording and Posting, Introduction to Trail Balance, Preparation of Final Account, Profit & Loss Account and related concepts, Balance Sheet and related concept.

8 Hours

UNIT-III

Financial statement analysis: Ratio analysis, Funds flow analysis, concepts, uses, Preparation of funds flow statement, simple problem, Cash flow analysis, Concepts, uses, preparation of cash flow statement, simple problem, Break – even analysis.

8 Hours

UNIT-IV

Definition nature and Objective of Financial Management, Long Term Sources of Finance, Introductory idea about capitalization, Capital Structure, Concept of Cost of Capital, introduction, importance, explicit & implicit cost, Measurement of cost of capital, cost of debt.

8 Hours

UNIT-V

Concept & Components of working Capital. Factors Influencing the Composition of working Capital, Objectives of working Capital Management – Liquidity Vs. Profitability and working capital policies. Theory of working capital: Nature and concepts, Cash Management, Inventory Management and Receivables Management.

Referential Books:

- Maheshwari & Maheshwari, "An Introduction to Accountancy", 8th Edition, Vikas Publishing House, 2003
- Gupta R.L., Gupta V.K., "Principles & Practice of Accountancy", Sultan Chand & Sons, 1999.
- Khan & Jain, "Financial Accounting"

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Mathematics II
BCA-205

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I
SETS
Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, Simple Applications.

8 Hours

UNIT-II
RELATIONS AND FUNCTIONS
Properties of Relations, Equivalence Relation, Partial Order Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions, Introduction of Trigonometric, Logarithmic and Exponential Functions.

8 Hours

UNIT-III
PARTIAL ORDER RELATIONS AND LATTICES
Partial Order Sets, Representation of POSETS using Hasse diagram, Chains, Maximal and Minimal Point, Glb, lub, Lattices & Algebric Systems, Principle of Duality, Basic Properties, Sublattices, Distributed & Complemented Lattics.

8 Hours

UNIT-IV
FUNCTIONS OF SEVERAL VARIABLES
Partial Differentiation, Change of Variables, Chain Rule, Extrema of Functions of 2 Variables, Euler's Theorem.
3D COORDINATE GEOMETRY
3D Coordinate Geometry: Coordinates in Sp ace, Direction Cosines, Angle Between Two Lines, Projection of Join of Two Points on a Plane, Equations of Plane, Straight Lines, Conditions for a line to lie on a plane, Conditions for Two Lines to be Coplanar, Shortest Distance Between Two Lines, Equations of Sphere, Tangent plane at a point on the sphere.

8 Hours

UNIT-V
MULTIPLE INTEGRATION
Double Integral in Cartesian and Polar Coordinates to find Area, Change of Order of Integration, Triple Integral to Find Volume of Simple Shapes in Cartesian Coordinates.

Referential Books:

- Kolman, Busby and Ross, "Discrete Mathematical Structure", PHI, 1996.
- S.K. Sarkar, "Discrete Math's"; S. Chand & Co., 2000

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

'C' Programming Lab
BCA-251

Credit-2

L	T	P
0	0	4

Content:

Write a program in C:

1. That accepts the marks of 5 subjects and finds the sum and percentage marks obtained by the student.
2. That calculates the Simple Interest and Compound Interest. (The Principal, Amount, Rate of Interest and Time are entered through the keyboard).
3. To calculate the area and circumference of a circle.
4. That accepts the temperature in Centigrade and converts into Fahrenheit using the formula C/5=(F-32)/9.
5. That swaps values of two variables using a third variable.
6. That checks whether the two numbers entered by the user are equal or not.
7. To find the greatest of three numbers.
8. That finds whether a given number is even or odd.
9. That tells whether a given year is a leap year or not.
10. To demonstrate the use of switch case statement.
11. To understand the concept of pointers.
12. To print the sum of all numbers up to a given number.
13. To find the factorial of a given number.
14. To print sum of even and odd numbers from 1 to N numbers.
15. To print the Fibonacci series.
16. To check whether the entered number is prime or not.
17. To find the sum of digits of the entered number.
18. To find the reverse of a number.
19. To print Armstrong numbers from 1 to 100.
20. To convert binary number into decimal number and vice versa.
21. That simply takes elements of the array from the user and finds the sum of these elements.
22. That inputs two arrays and saves sum of corresponding elements of these arrays in a third array and prints them.
23. To find the minimum and maximum element of the array.
24. To search an element in a array using Linear Search.
25. To sort the elements of the array in ascending order using Bubble Sort technique.
26. To add and multiply two matrices of order nxn.
27. That finds the sum of diagonal elements of a mxn matrix.
28. To implement strlen (), strcat (),strcpy () using the concept of Functions.
29. To demonstrate the structure and union.
30. To implement different file handling functions.

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Computer organization Lab
BCA-252

Credit-2

L	T	P
0	0	4

Content:

1. Bread Board Implementation of Flip-Flops.
2. Experiments with clocked Flip-Flop.
3. Design of Counters.
4. Bread Board implementation of counters & shift registers.
5. Implementation of Arithmetic algorithms.
6. Bread Board implementation of Adder/Subtractor (Half, Full)
7. Bread Board implementation of Binary Adder.
8. Bread Board implementation of Seven Segment Display.

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Object Oriented Programming Using C++
BCA-301

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I

Introduction

Introducing Object – Oriented Approach, Relating to other paradigms {Functional, Data, decomposition}. Basic terms and ideas, Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cin, cout, new, delete, operators.

8 Hours

UNIT-II

Classes and Objects

Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behavior of an object, Constructors and destructors, instantiation of objects, Default parameter value, object types, C++ garbage collection, dynamic memory allocation, Meta class / abstract classes.

8 Hours

UNIT-III

Inheritance and Polymorphism

Inheritance, Class hierarchy, derivation – public, private & protected, Aggregation, composition vs classification hierarchies, Polymorphism, Categorization of polymorphism techniques, Method polymorphism, Polymorphism by parameter, Operator overloading, Parametric Polymorphism

8 Hours

UNIT-IV

Generic function Template function, function name overloading, overriding inheritance methods, Run time polymorphism, Multiple Inheritance.

8 Hours

UNIT-V

Files and Exception Handling Streams and files, Namespaces, Exception handling, Generic Classes

Referential Books:

- A.R.Venugopal, Rajkumar, T. Ravishanker "Mastering C++", TMH, 1997 .
- S.B.Lippman & J.Lajoie, " C++ Primer", 3 rd Edition, Addison Wesley, 2000.The C programming Lang., Person Ecl – Dennis Ritchie
- R.Lafore, "Object Oriented Programming using C++", Galgotia Publications, 2004
- D.Parasons, "Object Oriented Programming using C++", BPB Publication.

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Data Structure Using C
BCA-302

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I

Introduction to Data Structure and its Characteristics Array Representation of single and multidimensional arrays; sparse arrays – lower and upper triangular matrices and Tri diagonal matrices with Vector representation also.

8 Hours

UNIT-II

Stacks and Queues

Introduction and primitive operations on stack; Stack application; Infix, postfix, prefix expressions; evaluation of postfix expression ; Conversion between prefix, infix and postfix, introduction and primitive operation on queues, D- queues and priority queues.

8 Hours

UNIT-III

Lists

Introduction to linked lists; Sequential and linked lists, operations such as traversal, insertion, deletion searching, Two way lists and Use of headers

8 Hours

UNIT-IV

Trees

Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion, deletion; Binary Search Tree

B-Trees

Introduction, The invention of B-Tree; Statement of the problem; Indexing with binary search trees; a better approach to tree indexes; B-Trees; working up from the bottom; Example for creating a B-Tree

8 Hours

UNIT-V

Sorting Techniques; Insertion sort, selection sort, merge sort, heap sort, searching Techniques: linear search, binary search and hashing

Referential Books:

- E.Horowiz and S.Sahani, "Fundamentals of Data Structures", Galgotia Book source Pvt. Ltd., 2003
- R.S.Salaria, " Data Structures & Algorithms" , Khanna Book Publishing Co. (P) Ltd..,2002
- Y.Langsam et. Al., " Data Structures using C and C++" , PHI, 1999

Sarvesh

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Computer Architecture & Assembly Language
BCA-303

Credit-4

L	T	P
3	1	0

Content:

UNIT-I **8 Hours**

Basic computer organization and design, Instructions and instruction codes, Timing and control/ instruction cycle, Register/ Type s of register/ general purpose & special purpose registers/ index registers, Register transfer and micro operations/ register transfer instructions, Memory and memory function, Bus/ Data transfer inst ructions, Arithmetic logic micro-operations/ shift micro-operations, Input/ Output and interrupts, Memory reference instructions, Memory interfacing memory/ Cache memory.

UNIT-II **8 Hours**

Central Processing Unit

General Register Organization/ stacks organizations instruction formats, addressing modes, Data transfer and manipulation. Program control reduced computer, pipeline/ RISC/ CISC pipeline vector processing/ array processing.

Arithmetic Algorithms: Integer multiplication using shift and add, Booth's algorithm, Integer division, Floating-point representations.

UNIT-III **8 Hours**

Computer Arithmetic

Addition, subtraction and multiplication algorithms, divisor algorithms. Floating point, arithmetic operations, decimal arithmetic operations, and decimal arithmetic operations.

Input – Output Organization

Peripheral devices, Input/output interface, ALU Asynchronous Data transfer, mode of transfer, priority interrupts, Direct memory Address (DMA), Input/ Output processor (IOP), serial communication.

UNIT-IV **8 Hours**

Evaluation of Microprocessor

Overview of Intel 8085 to Intel Pentium processors Basic microprocessors, architecture and interface, internal architecture, external architecture memory and input/ output interface.

UNIT-V **8 Hours**

Assembly language, Assembler, Assembly level instructions, macro, use of macros in I/C instructions, program loops, programming arithmetic and logic subroutines, Input-Output programming.

Referential Books:

- Leventhal, L.A, "Introduction to Microprocessors", Prentice Hall of India
- Mathur, A.P., "Introduction to Microprocessors", Tata McGraw Hill
- Rao,P.V.S., "Prospective in Computer Architecture" , Prentice Hall of India

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Business Economics
BCA-304

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I
The Scope and Method of Economics, the Economic Problem: Scarcity & Choice, The Price, Mechanism, and Demand & Supply Equilibrium: The Concept of Elasticity and its Applications.

8 Hours

UNIT-II
The Production Process: output decisions – Revenues Costs and Profit Maximization Laws of returns & Returns to Scale: Economics and Diseconomies of scale.

8 Hours

UNIT-III
Market Structure: Equilibrium of a firm and Price, Output Determination under Perfect Competition Monopoly, Monopolistic Competition & Oligopoly

8 Hours

UNIT-IV
Macro-Economic Concerns Inflation, Unemployment, Trade-Cycles, Circular Flow up to Four Sector Economy, Government in the Macro Economy: Fiscal Policy, Monetary Policy, Measuring national Income and Output

8 Hours

UNIT-V
The World Economy – WTO, Globalization, MNC's, Outsourcing, Foreign Capita l in India, Trips, Groups of Twenty (G-20), Issues of dumping, Export-Import Policy 2004-2009

Referential Books:

- Ahuja H.L., "Business Economics",S.Chand & Co., New Delhi, 2001
- Ferfuson P.R., Rothchild, R and Fergusen G.J."Business Economics" Mac-Millan, Hampshire, 1993
- Karl E.Case & Ray C. fair, "Principles of Economics" , Pearson Education , Asia, 2000
- Nellis, Joseph, Parker David, "The Essence of Business Economics", Prentice Hall, New Delhi, 1992.

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Mathematics-III
BCA-305

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I
COMPLEX VARIABLES: Complex Number System, Algebra of Complex Numbers, Polar Form, Powers and Roots, Functions of Complex Variables, Elementary Functions, Inverse Trigonometric Function.

8 Hours

UNIT-II
SEQUENCE, SERIES AND CONVERGENCE: Sequence, Finite and Infinite Sequences, Monotonic Sequence, Bounded Sequence, Limit of a Sequence, Convergence of a Sequence, Series, Partial Sums, Convergent Series, Theorems on Convergence of Series (statement, alternating series, conditional convergent), Leibnitz Test, Limit Comparison Test, Ratio Test, Cauchy's Root Test, Convergence of Binomial and Logarithmic Series, Raabe's Test, Logarithmic Test, Cauchy's Integral Test (without proof)

8 Hours

UNIT-III
VECTOR CALCULUS: Differentiation of Vectors, Scalar and Vector Fields, Gradient, Directional Derivatives, Divergence and Curl and their Physical Meaning.
FOURIER SERIES: Periodic Functions, Fourier series, Fourier Series of Even and Odd Functions, Half Range Series.

8 Hours

UNIT-IV
ORDINARY DIFFERENTIAL EQUATIONS OF FIRST ORDER: Variable- Separable, Method, Homogeneous Differential Equations, Exact Differential Equations , Linear Differential Equations, Bernoulli's Differential Equations, Differential Equations of First Order and First Degree by Integrating Factor.

8 Hours

UNIT-V
ORDINARY DIFFERENTIAL EQUATIONS OF SECOND ORDER: Homogenous Differential Equations with Constant Coefficients, Cases of Complex Roots and Repeated Roots, Differential Operator, Solutions by Methods of Direct Formulae for Particular Integrals, Solution by Undetermined Coefficients, Cauchy Differential Equations, (only Real and Distinct Roots) Operator Method for Finding Particular Integrals, (Direct Formulae).

Referential Books:

- 1. A.B. Mathur and V.P. Jaggi, "Advanced Engineering Mathematics", Khanna Publishers, 1999.
- 2. 2. H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Co., 9th Revised Ed.

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Object Oriented Programming Lab
BCA-351

Credit-2

L	T	P
0	0	4

Content:

Programs Related to C++:

01. Implementing classes and creation of objects.
02. Checking Precedence of operators & side effects.
03. Implementing various control structures & loops.
04. Making structured programming & stepwise refinement.
05. Implementing Procedural abstraction with functions.
06. Implementing Constructors and destructors.
07. Implementing Data abstraction & inheritance.
08. Implementing Multiple & hybrid inheritance.
09. Implementing Polymorphism concepts.
10. Implementing Operator overloading & friend's functions.
11. Working with new & delete, object copying.
12. Implementing Object slicing, this operator.
13. Exception handling mechanisms.
14. Implementing class templates & function templates.
15. Working with STL.
16. Creating files in C++ and file related operations.

Sarvesh

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Data Structure Using in 'C'
BCA-352

Credit-2

L	T	P
0	0	4

Content:

Write a Program in C:

1. **Sorting:** Bubble sort, Selection sort and Quick sort.
2. **Searching:** Linear Search and Binary Search.
3. Array implementation of Stack and Circular Queue.
4. Dynamic implementation of Stack, Linked List and Circularly Linked List.
5. To realize the creation of binary search tree.
6. For post order tree traversal.
7. To realize graph data structure.
8. To obtain minimum cost spanning tree of a given weighted graph.
9. To find shortest path using Warshal's algorithm and Dijikstra algorithm

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Computer Graphics & Multimedia Application
BCA-401

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I

Introduction: The Advantages of Interactive Graphics, Representative Uses of Computer Graphics, Classification of Application Development of Hardware and software for computer Graphics, Conceptual Framework for Interactive Graphics, Overview, Scan: Converting Lines, Scan Converting Circles, Scan Converting Ellipses.

8 Hours

UNIT-II

Hardcopy Technologies, Display Technologies, Raster-Scan Display System, Video Controller, Random-Scan Display processor, Input Devices for Operator Interaction, Image Scanners, Working exposure on graphics tools like Dream Weaver, 3D Effects etc, Clipping Southland- Cohen Algorithm, Cyrus-Beck Algorithm, Midpoint Subdivision Algorithm.

8 Hours

UNIT-III

Geometrical Transformation

2D Transformation, Homogeneous Coordinates and Matrix Representation of 2D Transformations, composition of 2D Transformations, the Window-to-Viewport Transformations, Introduction to 3D Transformations Matrix.

8 Hours

UNIT-IV

Representing Curves & Surfaces Polygon meshes parametric, Cubic Curves, Quadric Surface; Solid Modeling Representing Solids, Regularized Boolean Set Operation primitive Instancing Sweep Representations, Boundary Representations, Spatial Partitioning Representations, Constructive Solid Geometry Comparison of Representations.

8 Hours

UNIT-V

Introductory Concepts: Multimedia Definition, CD -ROM and the multimedia highway, Computer Animation (Design, types of animation, using different functions), Uses of Multimedia, Introduction to making multimedia – The stage of Project, hardware & software requirements to make good multimedia skills and Training opportunities in Multimedia Motivation for Multimedia usage.

Referential Books:

- Foley, Van Dam, Feiner, Hughes, Computer Graphics Principles& practice, 2000.
- D.J. Gibbs & D.C. Tsichritzs: Multimedia programming Object Environment& Frame work, 2000
- Ralf Skinmeiz and Klana Naharstedt, Multimedia: computing, Communication and Applications, Pearson, 2001
- D.Haran & Baker. Computer Graphics Prentice Hall of India,1986

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Operating System
BCA-402

Credit-4

L	T	P
3	1	0

Content:

UNIT-I **8 Hours**

Introduction, What is an operating system, Simple Batch Systems, Multi-programmed Batch systems, Time- Sharing Systems, Personal – Computer Systems, Parallel systems, Distributed systems, Real- Time Systems .
Memory Management: Background, Logical versus physical Address space, swapping, Contiguous allocation, Paging, Segmentation Virtual Memory: Demand Paging, Page Replacement, Page- replacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing, Other Considerations.

UNIT-II **8 Hours**

Processes: Process Concept, Process Scheduling, Operation on Processes CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple – Processor Scheduling. Process Synchronization: Background, the Critical – Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization.

UNIT-III **8 Hours**

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

UNIT-IV **8 Hours**

Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices; Input or Output Devices, Storage Devices, Buffering, Secondary Storage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap- Space Management, Disk Reliability.

UNIT-V **8 Hours**

Information Management: Introduction, A Simple File system, General Model of a File System, Symbolic File System, Basic File System, Access Control Verification, Logical File System, Physical File system File – System Interface; File Concept, Access Methods, Directory Structure, Protection, Consistency Semantics File – System Implementation: File – System Structure, Allocation Methods, Free- Space Management

Referential Books:

- Silbersachatz and Galvin, "Operating System Concepts", Person, 5th Edition. 2001
- Madnick E., Donovan J., "Operating Systems:, Tata McGraw Hill,2001
- Tennenbum, "Operating Systems", PHI, 4th Edition, 2000

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Software Engineering
BCA-403

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I
Software Engineering: Definition and paradigms, A generic view of software engineering.

8 Hours

UNIT-II
Requirements Analysis: Statement of system scope, isolation of top level processes and entitles and their allocation to physical elements, refinement and review. Analyzing a problem, creating a software specification document, review for correctness, consistency, and completeness.

8 Hours

UNIT-III
Designing Software Solutions: Refining the software Specification; Application of fundamental design concept for data, architectural and procedural designs using software blue print methodology and object oriented design paradigm; Creating design document: Review of conformance to software requirements and quality.

8 Hours

UNIT-IV
Software Implementation: Relationship between design and implementation, Implementation issues and programming support environment, Coding the procedural design, Good coding style and review of correctness and readability.

8 Hours

UNIT-V
Software Maintenance: Maintenance as part of software evaluation, reasons for maintenance, types of maintenance (Perceptive, adoptive, corrective), designing for maintainability, techniques for maintenance. Comprehensive examples using available software platforms/case tools, Configuration Management.

Referential Books:

- K.K.Aggarwal & Yogesh Singh "Software engineering", 2nd Edition., New Age International 2005.
- I.Sommerville, "Software Engineering", Addison Wesley, 2002.
- James Peter, W. Pedrycz, "Software Engineering: An Engineering Approach" John Wiley & Sons.

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Optimization Techniques
BCA-404

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I
Linear programming
Central Problem of linear Programming various definitions included Statements of basic theorem and also their properties, simplex methods, primal and dual simplex method, transport problem, tic-tac problem, and its solution. Assignment problem and its solution. Graphical Method Formulation, Linear Programming Problem.

8 Hours

UNIT-II
Queuing Theory
Characteristics of queuing system, Classification of Queuing Model Single Channel Queuing Theory, Generalization of steady state M/M/1 queuing models (Model-I, Model-II).

8 Hours

UNIT-III
Replacement Theory
Replacement of item that deteriorates replacement of items that fail. Group replacement and individual replacement.

8 Hours

UNIT-IV
Inventory Theory
Cost involved in inventory problem- single item deterministic model economics long size model without shortage and with shorter having production rate infinite and finite.

8 Hours

UNIT-V
Job Sequencing
Introduction, solution of sequencing problem Johns on s algorithm for n jobs through 2 machines [8]

Referential Books:

- Gillet B.E. "Introduction to Operation Research"
- Taha,H.A. "Operation Resear ch - an introduction"
- Kanti Swarup "Operation Research"
- S.D.Sharma "Operation Research"
- Hira & Gupta "Operation Research"

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Elements of Statistics
BCA-405

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I

Population, Sample and Data Condensation

Definition and scope of statistics, concept of population and simple with Illustration, Raw data, attributes and variables, classification, frequency distribution, cumulative frequency distribution.

8 Hours

UNIT-II

Measures of Central Tendency

Concept of central Tendency, requirements of a good measures of central tendency, Arithmetic mean, Median, Mode, Harmonic Mean, Geometric mean for grouped and ungrouped data.

8 Hours

UNIT-III

Measures of Dispersion:

Concept of dispersion, Absolute and relative measure of dispersion, range variance, Standard deviation, Coefficient of variation.

8 Hours

UNIT-IV

Permutations and Combinations

Permutations of 'n' dissimilar objects taken 'r' at a time (with or without repetitions), Simple examples, Applications,

Sample space, Events and Probability

Experiments and random experiments, Ideas of deterministic and non-deterministic experiments; Definition of sample space, discrete sample space, events; Types of events, Union and intersections of two or more events, mutually exclusive events, Complementary event, Exhaustive event; Simple examples. Classical definition of probability, Addition theorem of probability without Proof (upto three events are expected). Definition of conditional probability Definition of independence of two events, simple numerical problems.

8 Hours

UNIT-V

Statistical Quality Control

Introduction, control limits, specification limits, tolerance limits, process and product control; Control charts for X and R; Control charts for number of defective {n-p chart} ,control charts for number of defects {c - chart}

Referential Books:

1. S.C.Gupta - Fundamentals of statistics - Sultan chand & sons , Delhi.
2. D.N.Elhance - Fundamentals of statistics - Kitab Mahal, Allahabad.
3. Montogomery D.C. – Statistical Quality Control - John Welly and Sons
4. Goon, Gupta And Dasgupta - Fundamentals of statistics - The world press private ltd. , Kolkata.

Computer Graphics lab
BCA-451

Credit-2

L	T	P
0	0	4

Content:

1. Implementation of line generation using slope's method, DDA and Bresenham's algorithms.
2. Implementation of circle generation using Mid-point method and Bresenham's algorithm.
3. Implementation of ellipse generation using Mid-point method.
4. Implementation of polygon filling using Flood-fill, Boundary-fill and Scan-line algorithms.
5. Implementation of 2D transformation: Translation, Scaling, Rotation, Mirror Reflection and Shearing (write a menu driven program).
6. Implementation of Line Clipping using Cohen-Sutherland algorithm and Bisection Method.
7. Implementation of Polygon Clipping using Sutherland-Hodgman algorithm.
8. Implementation of 3D geometric transformations: Translation, Scalind and rotation.
9. Implementation of Curve generation using Interpolation methods.
10. Implementation of Curve generation using B-spline and Bezier curves.
11. Implementation of any one of Back face removal algorithms such as Depth-Buffer algorithm, Painter's algorithm, Warnock's algorithm, Scan-line algorithm).

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Operating System lab
BCA-452

Credit-2

L	T	P
0	0	4

Content:

EXPERIMENT-1

Study of UNIX commands with all their important options

EXPERIMENT-2

Program maintenance using make utility

EXPERIMENT-3

Study system calls related to process & process control

EXPERIMENT-4

Study system calls related to file operations.

EXPERIMENT-5

Study of functions related to threads (POSIX)

EXPERIMENT-6

Inter process communication (POSIX-IPC) using pipe

EXPERIMENT-7

Inter process communication (POSIX-IPC) using shared memory

EXPERIMENT-8

Study system calls related to semaphore

EXPERIMENT-9

Simulation of Process scheduling algorithm: Feedback policy

EXPERIMENT-10

Simulation of I/O requests scheduling algorithm: Elevator algorithm

EXPERIMENT-11

Simulation of deadlock handling algorithm: Banker's algorithm

EXPERIMENT-12

Simulation of Memory management algorithm: LRU page replacement algorithm.

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Introduction to DBMS
BCA-501

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I
Introduction: Characteristics of database approach, data models, DBMS architecture and data independence.

8 Hours

UNIT-II
E-R Modeling: Entity types, Entity set, attribute and key, relationships, relation types, roles and structural constraints, weak entities, enhanced E-R and object modeling, Sub classes; Super classes, inheritance, specialization and generalization.

8 Hours

UNIT-III
File Organization: Indexed sequential access files; implementation using B & B++ trees, hashing, hashing functions, collision resolution, extendible hashing, dynamic hashing approach implementation and performance.

8 Hours

UNIT-IV
Relational Data Model: Relational model concepts, relational constraints, relational alzebra SQL: SQL queries, programming using SQL.

8 Hours

UNIT-V
EER and ER to relational mapping: Data base design using EER to relational language. Data Normalization: Functional Dependencies, Normal form up to 3rd normal form. Concurrency Control: Transaction processing, locking techniques and associated, database recovery, security and authorization. Recovery Techniques, Database Security

Referential Books:

- Abraham Silberschatz, Henry Korth, S.Sudarshan, "Database Systems Concepts", 4th Edition, McGraw Hill, 1997.
- Jim Melton, Alan Simon, "Understanding the new SQL: A complete Guide", Morgan Kaufmann Publishers, 1993.
- A.K.Majumdar, P. Bhattacharya, "Database Management Systems", TMH, 1996.
- Bipin Desai, "An Introduction to database systems", Galgotia Publications, 1991.

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Java Programming and Dynamic Webpage Design
BCA-502

Credit-4

L	T	P
3	1	0

Content:

UNIT-I **8 Hours**

Java Programming: Data types, control structured, arrays, strings, and vector, classes (inheritance, package, exception handling) multithreaded programming.

UNIT-II **8 Hours**

Java applets, AWT controls (Button, Labels, Combo box, list and other Listeners, menu bar) layout manager, string handling (only main functions)

UNIT-III **8 Hours**

Networking (datagram socket and TCP/IP based server socket) event handling, JDBC: Introduction, Drivers, Establishing Connection, Connection Pooling.

UNIT-IV **8 Hours**

HTML: use of commenting, headers, text styling, images, formatting text with <FONT>, special characters, horizontal rules, line breaks, table, forms, image maps, <META> tags, <FRAMESET> tags, file formats including image formats.

Java Servlets: Introduction, HTTP Servlet Basics, The Servlet Lifecycle, Retrieving Information, Sending HTML Information, Session Tracking, Database Connectivity

UNIT-V **8 Hours**

Java Server Pages: Introducing Java Server Pages, JSP Overview, Setting Up the JSP Environment, Generating Dynamic Content, Using Custom Tag Libraries and the JSP Standard Tag Library, Processing Input and Output.

Referential Books:

- Patrick Naughton and Herbertz Schildt, "J ava-2 The Complete Reference" 199, TMH.
- Shelley Powers, "Dynamic Web Publishing" 2nd Ed. Techmedia, 1998.
- Ivor Horton, "Beginning Java-2" SPD Publication
- Jason Hunter, "Java Servlet Programming" O'Reilly
- Shelley Powers, "Dynamic Web Publishing" 2nd Ed. Techmedia, 1998

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Introduction Computer Network
BCA-503

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I

Basic Concepts: Components of data communication, distributed processing, standards and organizations. Line configuration, topology, Transmission mode, and categories of networks. OSI and TCP/IP Models: Layers and their functions, comparison of models. Digital Transmission: Interfaces and Modems: DTE-DCE Interface, Modems, Cable modems.

8 Hours

UNIT-II

Transmission Media: Guided and unguided, Attenuation, distortion, noise, throughput, propagation speed and time, wavelength, Shannon capacity, comparison of media.

8 Hours

UNIT-III

Telephony: Multiplexing, error detection and correction: Many to one, one too many, WDM, TDM, FDM, Circuit switching, pack et switching and message switching. Data link control protocols: Li ne discipline, flow control, error control, synchronous and asynchronous protocols, character and bit oriented protocols, Link access procedures. Point to point controls: Transmission states, PPP layers, LCP, Authentication, NCP. ISDN: Services, Historical outline, subscriber's access, ISDN Layers and broadcast ISDN.

8 Hours

UNIT-IV

Devices: Repeaters, bridges, gateways, routers, The Network Layer; Design issues, Routing algorithms, Congestion control Algorithms, Quality of service, Internetworking, Network-Layer in the internet.

8 Hours

UNIT-V

Transport and upper layers in OSI Model: Transport layer functions, connection management, functions of session layers, presentation layer and application layer.

Referential Books:

- A.S.Tanenbaum, "Computer Networks"; Pearson Education Asia, 4th Ed. 2003.
- Behrouz A.Forouzan, "Data Communication and Networking", 3rd Ed. Tata MCGraw Hill, 2004.
- William stallings, "Data and computer communications", Pearson education Asia, 7th Ed., 2002.

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Numerical Methods
BCA-504

Credit-4

L	T	P
3	1	0

Content:

UNIT-I **8 Hours**

Roots of Equations: Bisections Method, False Position Method, Newton's Raphson Method, Rate of convergence of Newton's method.

UNIT-II **8 Hours**

Interpolation and Extrapolation: Finite Differences, The operator E, Newton's Forward and Backward Differences, Newton's dividend differences formulae, Lagrange's Interpolation formula for unequal Intervals, Gauss's Interpolation formula, Starling formula, Bessel's formula, Laplace- Everett formula.

UNIT-III **8 Hours**

Numerical Differentiation Numerical Integration: Introduction, direct methods, maxima and minima of a tabulated function, General Quadratic formula, Trapezoidal rule, Simpson's One third rule, Simpson's three- eight rule.

UNIT-IV **8 Hours**

Solution of Linear Equation: Gauss's Elimination method and Gauss's Siedel iterative method.

UNIT-V **8 Hours**

Solution of Differential Equations: Euler's method, Picard's method, Fourth-order Ranga – Kutta method.

Referential Books:

- Scarborough, "Numerical Analysis".
- Gupta & Bose S.C. "Introduction to Numerical Analysis, "Academic Press, Kolkata,
- S.S.Shashtri, "Numerical Analysis", PHI

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Database Management System Lab
BCA-551

Credit-2

L	T	P
0	0	4

Content:

The program me to be implemented using SQL

1. Create Table, SQL for Insertion, Deletion, Update and Retrieval using aggregating functions.
2. Write Programs in PL/SQL, Understanding the concept of Cursors.
3. Write Program for Join, Union & intersection etc.
4. Creating Views, Writing Assertions, and Triggers.
5. Creating Forms, Reports etc.
6. Writing codes for generating read and update operator in a transaction using different situations.
7. Implement of 2PL concerning central algorithm.
8. Developing code for understanding of distributed transaction processing.
9. Students are advised to use Developer 2000 Oracle 8+ version for above experiments.
10. However, depending on the availability of Software's students may use power builder/SQL Server/DB2 etc.

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Java Programming Lab
BCA-552

Credit-2

L	T	P
0	0	4

Content:

The programmed to be implemented using JAVA language:

1. Write a program in Java for illustrating, overloading, over riding and various forms of inheritance.
2. Write programs to create packages and multiple threads in Java.
3. Write programs in Java for event handling Mouse and Keyboard events.
4. Using Layout Manager create different applications.
5. Write programs in Java to create and manipulate Text Area, Canvas, Scroll Bars, Frames and Menus using swing/AWT.
6. Using Java create Applets.
7. Use Java Language for Client Server Interaction with stream socket connections.
8. Write a program in java to read data from disk file.

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Summer Training
BCA-553

Credit-4

L	T	P
0	0	0

Content:

Students have to undergo six to eight-week industrial training at end of Fourth semester.

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

Computer Network Security
BCA-601

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I

Introduction: Attack, Services and Mechanism, Model for Internetwork Security. Cryptography: Notion of Plain Text, Encryption, Key, Cipher Text, Decryption and cryptanalysis; Public Key Encryption, digital Signatures and Authentication.

8 Hours

UNIT-II

Network Security:

Authentication Application: Kerberos, X.509, Directory Authentication Service, Pretty Good Privacy, S/Mime.

8 Hours

UNIT-III

IP security Architecture: Overview, Authentication header, Encapsulating Security Pay Load combining Security Associations, Key Management.

8 Hours

UNIT-IV

Web Security: Requirement, Secure Socket Layer, Transport Layer Security, and Secure Electronic Transactions.

Network Management Security: Overview of SNMP Architecutre-SMMPVI1 Communication Facility, SNMPV3.

8 Hours

UNIT-V

System Security: Intruders, Viruses and Relate Threats, Firewall Design Principles. Comprehensive examples using available software platforms/case tools, Configuration Management.

Referential Books:

- W. Stallings, Networks Security Essentials: Application & Standards, Pearson Education, 2000.
- W.Stallings, Cryptography and Network Security, Principles and Practice, Pearson Education, 2000.

Saavesh

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

E-COMMERCE
BCA-602

Credit-4

L	T	P
3	1	0

Content:

8 Hours

UNIT-I

Introduction to E-Commerce:

The Scope of Electronic Commerce, Definition of Electronic Commerce, Electronic E-commerce and the Trade Cycle, Electronic Markets, Electronic Data Interchange, Internet Commerce, E-Commerce in Perspective. Business Strategy in an Electronic Age: Supply Chains, Porter's Value Chain Model, Inter Organizational Value Chains, Competitive Strategy, Porter's Model, First Mover Advantage Sustainable Competitive Advantage, Competitive Advantage using E-Commerce, Business Strategy, Introduction to Business Strategy, Strategic Implications of IT, Technology, Business Environment, Business Capability, Exiting Business Strategy, Strategy Formulation & Implementation Planning, E-Commerce Implementation, E-Commerce Evaluation.

8 Hours

UNIT-II

Business-to-Business Electronic Commerce:

Characteristics of B2B EC, Models of B2B EC, Procurement Management Using the Buyer's Internal Marketplace, Just in Time Delivery, Other B2B Models, Auctions and Services from Traditional to Internet Based EDI, Integration with Back-end Information System, The Role of Software Agents for B2B EC, Electronic marketing in B2B, Solutions of B2B EC, Managerial Issues, Electronic Data Interchange (EDI), EDI: The Nuts and Bolts, EDI & Business.

8 Hours

UNIT-III

Internet and Extranet:

Automotive Network Exchange, The Largest Extranet, Architecture of the Internet, Intranet and Extranet, Intranet software, Applications of Intranets, Intranet Application Case Studies, Considerations in Intranet Deployment, The Extranets, The structures of Extranets, Extranet products & services, Applications of Extranets, Business Models of Extranet Applications, Managerial Issues. Electronic Payment Systems : Is SET a failure, Electronic Payments & Protocols, Security Schemes in Electronic payment systems, Electronic Credit card system on the Internet, Electronic Fund transfer and Debit cards on the Internet, Stored – value Cards and E- Cash, Electronic Check Systems, Prospect of Electronic Payment Systems, Managerial Issues.

8 Hours

UNIT-IV

Public Policy: From Legal Issues to Privacy:

EC- Related Legal Incidents, Legal Incidents, Ethical & Other Public Policy Is sues, Protecting Privacy, Protecting Intellectual Property, Free speech, Internet Indecency & Censorship, Taxation & Encryption Policies.

Other Legal Issues: Contracts, Gambling & More, Consumer & Seller Protection in EC.

8 Hours

UNIT-V

Infrastructure for EC:

It takes more than Technology, A Network Of Networks, Internet Protocols, Web- Based client/ Server, Internet Security, selling on the web, Chatting on the Web, Multimedia delivery, Analyzing Web Visits, Managerial Issues.

- **Referential Books:**
- David Whiteley, " E-Commerce", Tata McGraw Hill, 2000
- Eframi Turban, Jae Lee, David King, K. Mi chale Chung, "Electronic Commerce", Pearson Education, 2000

MAJOR PROJECT
BCA-651

Credit-12

L	T	P
0	0	4

Content:

A group of students have to make a latest technology based project in their respective stream. It may be hardware or software based.

Evaluation:

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

Rama University Uttar Pradesh, Kanpur
Faculty of Engineering & Technology

COLLOQUIUM
BCA-652

Credit-4

L	T	P
0	0	2

Content:

An academic meeting or seminar usually led by a different lecture and on a different topic at each meeting. An address to an academic meeting or seminar.

Chairperson
Signature: .....
Name: Dr. Vivek Srivastava
Date:

Internal Members
Signature:
1..... 2.....
Name: Mr. Sarvesh Kumar Mr. Somendra Tripathi
Date:

Signature: 3.....
Name: Ms. Neelu Kushwaha
Date:

External Members
Signature:
1..... 2.....
Name: Dr. Amod Tiwari Mr. Vishal Nagar
Date: