**BCA Cloud Technology**

**SCHEME & SYLLABUS**

**BATCH: 2023-26**

**INDEX**

|  |  |  |
| --- | --- | --- |
| **S. No** | **Contents** | **Page No.** |
| 1 | Vision, Mission And Quality Policy Of University |  |
| 2 | Knowledge Wheel |  |
| 3 | Preamble |  |
| 4 | About Program and Program Outcomes (POs) |  |
| 5 | Examination System |  |
| 6 | Assessment & Grade Point Average: SGPA, CGPA |  |
| 7 | Guidelines for MOOC Courses |  |
| 8 | Teaching Scheme of all Semesters |  |
| 9 | Teaching Syllabus of all Semesters |  |

**Disclaimer:** The scheme, syllabus and other materials published in this booklet may be changed or modified as per the requirement after approval of competent authority. The decision taken by the management of Poornima University will be final and abiding to all.

**Student Details**

Name of Student:

Name of Program:

Semester: Year: Batch:

Faculty of:

******

***VISION***

To create knowledge based society with scientific temper, team spirit and dignity of labor to face global competitive challenges.

***Mission***

To evolve and develop skill based systems for effective delivery of knowledge so as to equip young professionals with dedication and commitment to excellence in all spheres of life.

***Quality Policy***

To provide Quality Education through Faculty development, updating of facilities and continual improvement meeting University norms and keeping stake holders satisfied.

***Knowledge Wheel***

At Poornima, the academic atmosphere is a rare blend of modern technical as well as soft skills and traditional systems of learning processes.



**About Program and Program Outcomes (PO):**

**Title of the Programme:** Bachelor of Computer Applications (BCA)

**Nature of the Programme:** BCA is a three year full-time programme.

**Program Outcomes (PO) :**

Graduates will be able to:

**PO1: Computational information:** Appreciate and apply mathematical organization, computing and domain information for the conceptualization of computing models from clear harms.

**PO2: Difficulty Analysis:** Talent to classify, significantly evaluate and prepare complex computing problems using fundamentals of computer knowledge and request domains.

**PO3: Drawing / Improvement of Solutions:** Facility to transform composite production scenarios and present-day issues into problems, explore, recognize and propose included solutions using rising technologies.

**PO4: Accomplish Investigations of Compound Computing Troubles:** Ability to invent and ways experiments interpret data and present well up to date conclusions.

**PO5: Current Implement Procedure:** Skill to select recent computing tools, skills and techniques compulsory for original software solutions

**PO6: Proficient Principles:** Facility to apply and give expert principles and cyber systems in a universal monetary situation.

**PO7: Ultimate Education:** Identify the need for and enlarge the ability to appoint in permanent education as a Computing qualified.

**PO8: Individual and team work:** Ability to job as a part or manager in various teams in multidisciplinary situations.

**PO9: Communication:** being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO10: Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**Examination System :**

1. **Marks Distribution of Theory Course:**

**THEORY COURSE**

**ESE (Th.)**

**60**

**IE (Th.)**

**40**

**CIE-II (Th.)**

**8**

**CIE-I (Th.)**

**16**

**MSE (Th.)**

**16**

1. **Marks Distribution of Practical Course :**

**PRACTICAL COURSE**

**ESE (Pr.)**

**40**

**IE (Pr.)**

**60**

**CIE-II (Pr.)**

**12**

**CIE-I (Pr.)**

**24**

**MSE (Pr.)**

**24**

**Th**.: Theory, Pr**.**: Practical, **ESE:** End Semester Examination, **MSE:** Mid Semester Examination, **CIE:** Continuous Internal Evaluation.

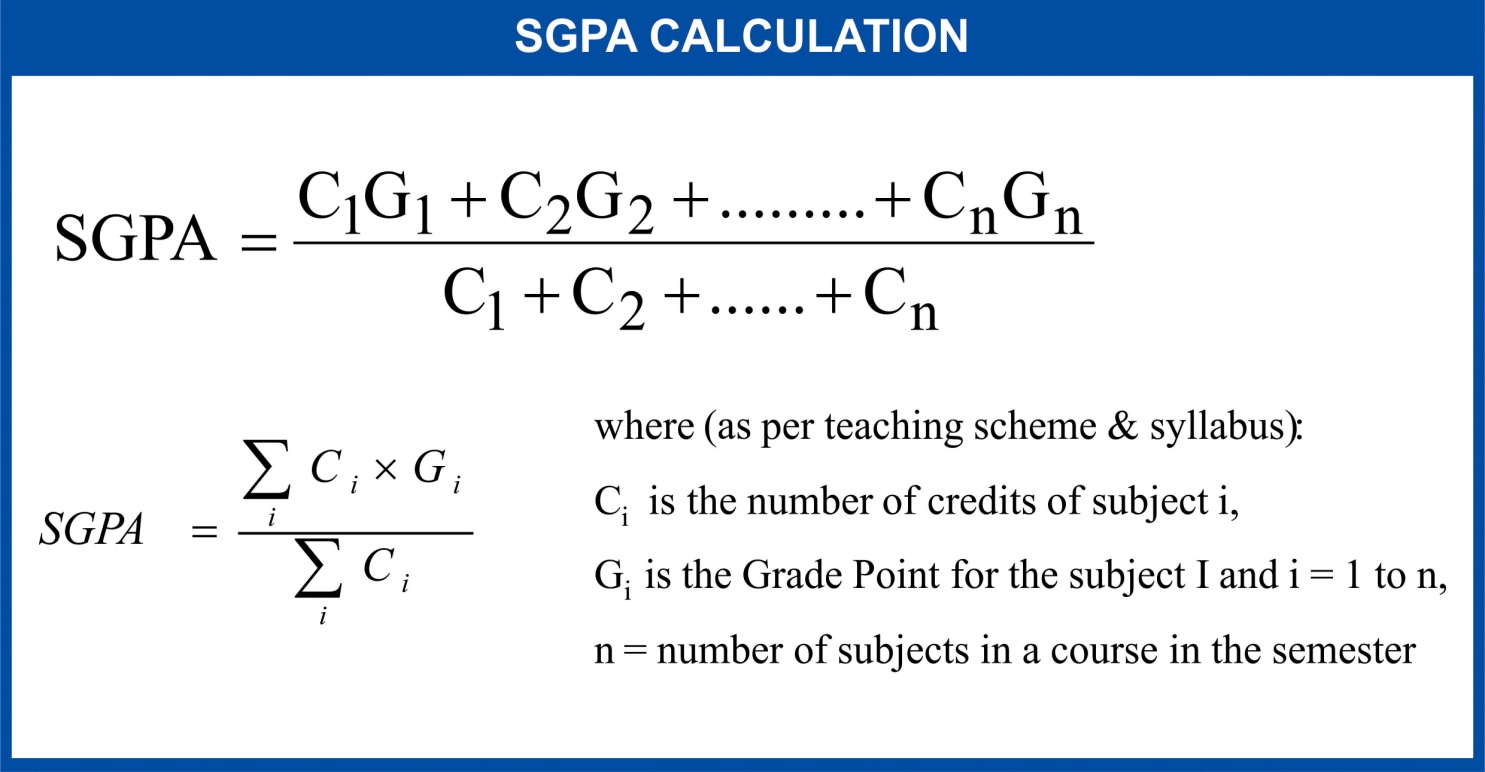
**CO Wise Marks Distribution:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Exam Entity** | **Theory Subject** | | **Practical/ Studio Subject** | |
| **Maximum Marks** | **CO to be Covered** | **CO to be Covered** | **Maximum Marks** |
| **CIE-I** | 16 ( 8 + 8) | 1 & 2 | 1 & 2 | 24 (12 + 12) |
| **MSE** | 16 ( 8 + 8) | 3 & 4 | 3 & 4 | 24 (12 + 12) |
| **CIE-II (Activity/ Assignment )** | 8 (8) | 5 | 5 | 12 (12) |
| **ESE** | 60 | - | - | 40 |
| **TOTAL** | 100 | - | - | 100 |

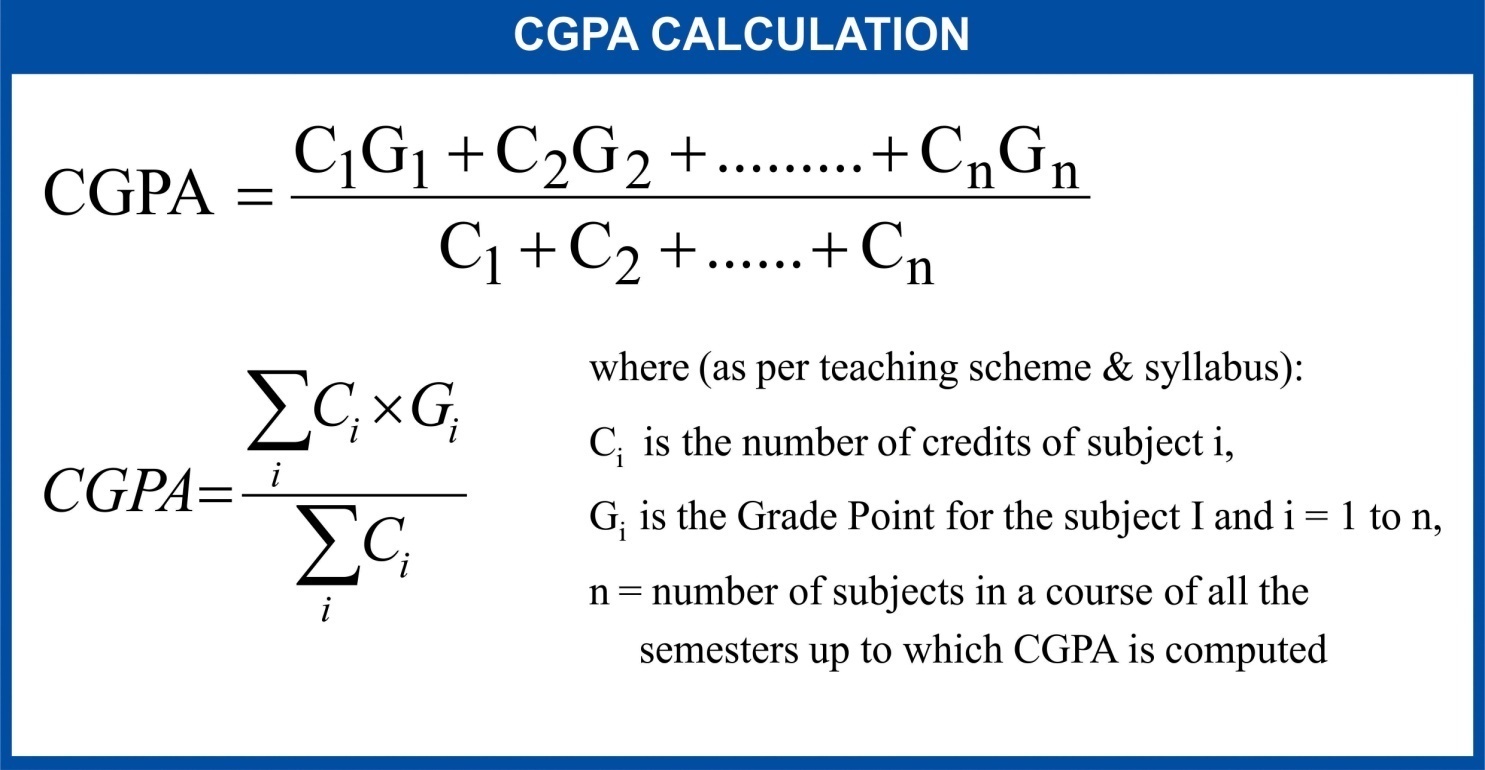
**Minimum Passing Percentage in All Exams:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S No.** | **Program Name** | **Minimum Passing Percentage in** | | |
| **IE**  **Component** | **ESE**  **Component** | **Total**  **Component** |
| **1** | Course Work for PhD Registration | **-** | **-** | **50%** |
| **2** | B. Arch. | **-** | **45%** | **50%** |
| **3** | MBA, MCA, M.Des., M.Tech., M.Plan, MHA, MPH | **-** | **40%** | **40%** |
| **4** | MBA, MCA, M.Des., M.Tech., M.Plan, MHA, MPH | **-** | **35%** | **35%** |

**SGPA Calculation**

****

**CGPA Calculation**

****

**Grading Table:**

**Applicable for B.Arch. & Ph.D. Courses Applicable for All Courses except B.Arch. & Ph.D.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Academic Performance | Grade | Grade Point | Marks Range (in %) |  | Academic Performance | Grade | Grade Point | Marks Range (in %) |
| Outstanding | O | 10 | 90≤ x ≤100 | Outstanding | O | 10 | 90≤ x ≤100 |
| Excellent | A+ | 9 | 80≤ x <90 | Excellent | A+ | 9 | 80≤ x <90 |
| Very Good | A | 8 | 70≤ x <80 | Very Good | A | 8 | 70≤ x <80 |
| Good | B+ | 7 | 60≤ x <70 | Good | B+ | 7 | 60≤ x <70 |
| Above Average | B | 6 | 50≤ x <60 | Above Average | B | 6 | 50≤ x <60 |
| Fail | F | 0 | x <50 | Average | C | 5 | 40≤ x <50 |
| Absent | Ab | 0 | Absent | Pass | P | 4 | 35≤ x <40 |
|  |  |  |  | Fail | F | 0 | x <35 |
|  |  |  |  |  | Absent | Ab | 0 | Absent |

**CGPA to percentage conversion rule:**

**Equivalent % of Marks in the Program = *CGPA* \*10**

**Award of Class**

|  |  |  |
| --- | --- | --- |
| **CGPA** | **Percentage** | **Equivalent Division** |
| 7.50 ≤ CGPA | 75% or more | First Division with Distinction |
| 6.00 ≤ CGPA < 7.50 | 60% ≤ x <75% | First Division |
| 5.00 ≤ CGPA < 6.00 | 50% ≤ x <60% | Second Division |
| 4.00 ≤ CGPA < 5.00 | 40% ≤ x < 50% | Pass Class |

**Guidelines for Massive Open Online Courses (MOOCs)**

**(Session 2023-24)**

Poornima University, in its never ending endeavor to equip students with best-of-class learning and knowledge, has undertaken to include MOOC courses as part of its credit scheme from session 2023-24 onwards. The objective behind this is to enable students to study courses designed by the best teachers in the country and to scale their knowledge base with the rest of learners from the nation. The MOOCs which are included under this scheme is can be chosen from SWAYAM and NPTEL.

1. **Introduction of MOOCs: SWAYAM and NPTEL**

**About SWAYAM:**

SWAYAM is a programme initiated by Government of India and designed to achieve the three cardinal principles of Education Policy viz., access, equity and quality. The objective of this effort is to take the best teaching learning resources to all, including the most disadvantaged. SWAYAM seeks to bridge the digital divide for students who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy.

This is done through a platform that facilitates hosting of all the courses, taught in classrooms to be accessed by anyone, anywhere at any time. All the courses are interactive, prepared by the best teachers in the country and are available, free of cost to any learner. However learners wanting a SWAYAM certificate should register for the final proctored exams that come at a fee and attend in-person at designated centers on specified dates. Eligibility for the certificate will be announced on the course page and learners will get certificates only if this criteria is matched.

The courses hosted on SWAYAM are in 4 quadrants – (1) video lecture, (2) specially prepared reading material that can be downloaded/printed (3) self-assessment tests through tests and quizzes and (4) an online discussion forum for clearing the doubts. Steps have been taken to enrich the learning experience by using audio-video and multi-media and state of the art pedagogy / technology.

In order to ensure that best quality content is produced and delivered, nine National Coordinators have been appointed. They are:

1. [AICTE](https://swayam.gov.in/nc_details/AICTE) (All India Council for Technical Education) for self-paced and international courses
2. [NPTEL](https://swayam.gov.in/nc_details/NPTEL) (National Programme on Technology Enhanced Learning) for Engineering
3. [UGC](https://swayam.gov.in/nc_details/UGC) (University Grants Commission) for non-technical post-graduation education
4. [CEC](https://swayam.gov.in/nc_details/CEC) (Consortium for Educational Communication) for under-graduate education
5. [NCERT](https://swayam.gov.in/nc_details/NCERT) (National Council of Educational Research and Training) for school education
6. [NIOS](https://swayam.gov.in/nc_details/NIOS) (National Institute of Open Schooling) for school education
7. [IGNOU](https://swayam.gov.in/nc_details/IGNOU) (Indira Gandhi National Open University) for out-of-school students
8. [IIMB](https://swayam.gov.in/nc_details/IIMB) (Indian Institute of Management, Bangalore) for management studies
9. [NITTTR](https://swayam.gov.in/nc_details/NITTTR) (National Institute of Technical Teachers Training and Research) for Teacher Training programme

Two types of courses are offered on SWAYAM platform: Credit Courses and Non- Credit Courses. Credit courses are offered for each semester in January and July every year. The list is available on SWAYAM official website: <https://onlinecourses.swayam2.ac.in/>

**About NPTEL:**

NPTEL (National Programme on Technology Enhanced Learning), is a joint venture of the IITs and IISc, funded by the Ministry of Education (MoE) Government of India, and was launched in 2003. Initially started as a project to take quality education to all corners of the country, NPTEL now offers close to 600+ courses for certification every semester in about 22 disciplines.

**Some highlights:**

* + Largest online repository in the world of courses in engineering, basic sciences and selected humanities and management subjects
  + YouTube channel for NPTEL – most subscribed educational channel, 1.3 billion views and 40+ lakhs subscribers
  + More than 56000 hours of video content, transcribed and subtitled
  + Most accessed library of peer-reviewed educational content in the world
  + Translation of more than 12000 hrs of English transcripts in regional Indian languages

**NPTEL Online Certification:**

The objective of enabling students obtain certificates for courses is to make students employable in the industry or pursue a suitable higher education programme. Through an online portal, 4, 8, or 12-week online courses, typically on topics relevant to students in all years of higher education along with basic core courses in sciences and humanities with exposure to relevant tools and technologies, are being offered. Enrolment to and learning from these courses is free. Following these online courses, an in-person, proctored certification exam is conducted and a certificate is provided through the participating institutions and industry, as applicable.

Some statistics regarding the open online courses since March 2014 till Dec 2021

Completed courses: 3496;

Enrollments across courses: 1.58 CRORE +

Number of exam registrations: 15.1 LAKH +

All the statistics pertaining to completed courses are available at [https://beta.nptel.ac.in/courses.](https://nptel.ac.in/courses)  
All courses are completely free to enroll and learn from. The certification exam is optional and comes at a fee of Rs 1000/course exam.

1. **MOOCs at Poornima University:**

MOOCs envelops best in class teaching - learning processes along with meeting the requirements of various courses in terms of quality of teaching and evaluation system. To promote the MOOCs among students of Poornima University, it is decided to consider the credits earned through MOOCs.

**(a) Options for MOOCs at Poornima University**

**(For this document, only those MOOCs will be considered which are available on SWAYAM & NPTEL platforms)**

* + Credit and Non-credit SWAYAM MOOCs can be opted by anyone, anytime, anywhere and in any language. However, prior-permission of the University Authorities is mandatory if the credits are to be transferred to regular degree.
  + In case of credit courses, there are two ways to opt these courses for the purpose of credit transfer to PU system as given below:

**OPTION–I: As Open Elective (for batches entered till 2022) / Multidisciplinary Courses (for batches admitted from 2023-24 onwards):**

Open Elective (for batches entered till 2022) / Multidisciplinary Courses (for batches admitted from 2023-24 onwards) are available at University level in offline mode for which relevant booklets are already published. **These courses carries 02 credits.** These category/type of courses (similar/different) are also available as MOOC courses. The respective Deans / HODs shall provide both the options to all the students to either select offline courses or MOOCs as per details given below:

* + Deans / HODs shall prepare a list of upto 05 appropriate MOOC courses of 02/03 credits each, well in advance (at-least 15 days prior to commencement of semester) and take approval from the Office of Dean, Academics / Pro-President, PU.
  + After approval, the respective Deans / HODs shall circulate a notice to all their respective students so that they can select any one course from the list, the credits **(only 02)** of which will be counted against Open Elective/ Multidisciplinary courses pertaining to that particular semester.
  + If the students are not willing to opt for MOOC Open Elective/ Multidisciplinary course, they can proceed with the current offline practice of opting for Multidisciplinary courses.
  + The tutor of the class shall monitor the progress (assignments, feedback, any problem etc.) on weekly basis and report to Head/Dean.

**OR**

**OPTION–II: As Major / Minor Courses:**

* + Deans / HODs shall identify a course of **03 credits** for each semester, well in advance (at-least 15 days prior to commencement of semester) and take approval from the Office of Dean, Academics / Pro-President, PU.
  + After approval, the respective Deans / HODs shall circulate a notice to all their respective students citing that the particular course will be conducted through MOOCs only and is compulsory for all respective students. The credits of this course will be counted against Major/Minor courses pertaining to that particular semester.
  + The tutor of the class shall monitor the progress (assignments, feedback, any problem etc.) on weekly basis and report to Head/Dean.
  + This is to be noted that if Deans / HODs decide to conduct any major/minor course in any semester through MOOCs, no offline course will be conducted against that.

**(b) Important points related to MOOCs at Poornima University**

* + Only one MOOC shall be allowed in a particular semester for the purpose of credit transfer in the beginning.
  + No attendance will be taken for MOOC courses.
  + Last period of T/T/S shall be taken for MOOC courses which shall be in self-study mode.
  + The method of assessments of MOOC such as assignments and examination are completely associated with that particular MOOC and no exam will be conducted by the department as well as by the Examination Cell.
  + The respective Dean / HOD must submit the detail of course i.e., code, name and credit of MOOC opted against that particular course in particular semester attached with highlighting in the related examination scheme of syllabus of that semester signed by BOS Convener / HoD and Dean of Faculty to the office of Pro-President before commencement of the classes.
  + SWAYAM will award a certificate to all the students passing the examination along with the credit earned. The center of examination for SWAYAM MOOCs will be finalized by SWAYAM. All the responsibility related to registration for MOOCs, timely submission of assignments, examinations etc. will be borne by the students only.
  + The list of registered students in MOOC along with name of course will be submitted to the Examination Cell by the Deans / HoDs before commencement of the classes.
  + Any student who would not be able to register/present/clear/pass the MOOC in the stipulated time, it is the choice of the student that he or she may register in next semester (odd or even) with MOOC again or appear as a back exam candidate of the University as per PU norms.
  + There will be no provision of re-evaluation of MOOC.
  + The scorecard and related certificate of MOOC along with a consolidated list of students with marks of assignment and final exam will be submitted to the examination cell by the concerned Dean / HOD for further process. It is also recommended that alteration/changes/scaling in marks obtained by the students in any MOOC will not be considered.
  + The exam registration fee of MOOC up to Max. INR 1000/- will be reimbursed to the student only after successful completion of the course in first attempt and submission of the fee receipt, score-card and certificate of the MOOC to the concerned department within stipulated time after declaration of the results.

**NOTE: This is to be noted that the procedure for getting approval from BOS, Faculty Board, Academic Council and BoM is to be followed as per regular process.**

**Attached Items:**

|  |  |
| --- | --- |
| Open Elective Booklet | Annexure-1 |
| Soft Skills Booklet | Annexure-2 |
| Value Added Course Booklet | Annexure-3 |

| **POORNIMA UNIVERSITY, JAIPUR**  **Faculty of Computer Science and Engineering** | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Name of Program :BCA with Minor in Artificial Intelligence and Data Science Duration: 3 years Total Credits: 131** | | | | | | | | | | | | |
| **Teaching Scheme for Batch 2023-26** | | | | | | | | | | | | |
| **Semester-I** | | | | | | | | | | | | |
| **Course Code** | **Name of Course** | **Teaching Scheme** | | | | |  | **Marks Distribution** | | | | **Credits** |
| **Lecture (L)** | **Tutorial (T)** | **Practical**  **(P)** | | | **SH** | **IE** | **ESE** | | **Total** |
| **A.** | **Major (Core Courses)** | | | | | | | | | | | |
| **A.1** | **Theory** |  |  |  |  | | |  |  | |  |  |
| BCACCA1101 | Programming Fundamentals of C | **3** | **-** | **-** | **1+ 1\*** | | | **40** | **60** | | **100** | **3** |
| BCACCA1102 | Operating System | **3** | **-** | **-** | **1\*** | | | **40** | **60** | | **100** | **3** |
| BCACCA1103 | Computer Fundamental and Office Automation | **3** | **-** | **-** | **1\*** | | | **40** | **60** | | **100** | **3** |
| BCACCA1104 | Introduction to Web Technology | **3** | **-** | **-** | **2\*** | | | **40** | **60** | | **100** | **3** |
| **A.2** | **Practical** |  |  |  |  | | |  |  | |  |  |
| BCACCA1201 | Programming Fundamentals of C Lab | **-** | **-** | **2** |  | | | **60** | **40** | | **100** | **1** |
| BCACCA1202 | Operating System Lab | **-** | **-** | **2** |  | | | **60** | **40** | | **100** | **1** |
| BCACCA1203 | Office Automation Lab | **-** | **-** | **2** |  | | | **60** | **40** | | **100** | **1** |
| BCACCA1204 | Web Technology Lab |  |  | **2** |  | | | **60** | **40** | | **100** | **1** |
| **B.** | **Minor Stream Courses/Department Elective** | | | | | | | | | | | |
| **B.1** | **Theory** |  |  |  | |  | |  |  | |  |  |
| BCTCCA1101 | Fundamentals of Cloud Technology | **3** |  |  | | **1\*** | | **40** | **60** | | **100** | **3** |
| **B.2** | **Practical** |  |  |  | |  | |  |  | |  |  |
|  | - | - | - | - | |  | | - | - | | - |  |
| **C** | **Multidisciplinary Courses** | | | | | | | | | | | |
|  | - | **-** | - | - | |  | | - | - | | - | **-** |
| **D** | **Ability Enhancement Courses (AEC)** | | | | | | | | | | | |
| BULCHU1202 | Foundation English | **-** | **-** | **2** | |  | | **60** | **40** | | **100** | **1** |
| **E** | **Skill Enhancement Courses (SEC)** | | | | | | | | | | | |
| BULCSE1201 | Skill Enhancement Generic Course –I | **-** | **-** | **2** | |  | | **60** | **40** | | **100** | **1** |
| **F** | **Value Added Courses (VAC)** | | | | | | | | | | | |
| BUVCSA1102 | Environmental Studies | **2** | **-** | **-** | |  | | **40** | | **60** | **100** | **2** |
| **G** | **Summer Internship / Research Project / Dissertation** | | | | | | | | | | | |
|  |  |  |  |  | |  | |  |  | |  |  |
| **Total** | | **17** | **-** | **12** | | **1+6\*** | |  |  | |  |  |
| **Total Teaching Hours** | | **30/36** | | | |  | |  |  | |  | **23** |

SH: Supporting Hours

* Classes will be conducted fortnight on I,III and IV Saturday

| **POORNIMA UNIVERSITY, JAIPUR**  **Faculty of Computer Science and Engineering** | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Name of Program : BCA with Minor in Artificial Intelligence and Data Science Duration: 3 years Total Credits: 131** | | | | | | | | | | | | | |
| **Teaching Scheme for Batch 2023-26** | | | | | | | | | | | | | |
| **Semester-II** | | | | | | | | | | | | | |
| **Course Code** | **Name of Course** | **Teaching Scheme** | | | | |  | **Marks Distribution** | | | | | **Credits** |
| **Lecture (L)** | **Tutorial (T)** | **Practical**  **(P)** | | | **SH** | **IE** | **ESE** | | **Total** | |
| **A.** | **Major (Core Courses)** | | | | | | | | | | | | |
| **A.1** | **Theory** |  |  |  | | |  |  |  | |  | |  |
| BCACSA2101 | Basic of Mathematics | **3** |  |  | | | **1\*** | **40** | **60** | | **100** | | **3** |
| BCACCA2102 | Computer Networks | **3** |  |  | | | **1\*** | **40** | **60** | | **100** | | **3** |
| BCACCA2103 | Python Programming | **3** |  |  | | | **1\*** | **40** | **60** | | **100** | | **3** |
| BCACCA2104 | Linux and Shell Script | **3** |  |  | | | **1\*** | **40** | **60** | | **100** | | **3** |
| BCACCA2105 | Software Engineering | **3** |  |  | | | **1\*** | **40** | **60** | | **100** | | **3** |
| **A.2** | **Practical** |  |  |  | | |  |  |  | |  | |  |
| BCACCA2201 | Computer Networks Lab |  |  | **2** | | |  | **60** | **40** | | **100** | | **1** |
| BCACCA2202 | Python Programming Lab |  |  | **2** | | |  | **60** | **40** | | **100** | | **1** |
| BCACCA2203 | Linux and Shell Script Lab |  |  | **2** | | |  | **60** | **40** | | **100** | | **1** |
| BCACCA2204 | **Software Enginee**ring Lab |  |  | **2** | | |  | **60** | **40** | | **100** | | **1** |
| **B.** | **Minor Stream Courses** | | | | | | | | | | | | |
| **B.1** | **Theory** |  |  |  | |  | |  |  | |  |  | |
| **B.2** | **Practical** |  |  |  | |  | |  |  | |  |  | |
| **C** | **Multidisciplinary Courses** | | | | | | | | | | | | |
| BCAEMC2121 | MOOC Course-I | 1 | - | - | | 1\* | | **40** | | **60** | **100** | **1** | |
| **D** | **Ability Enhancement Courses (AEC)** | | | | | | | | | | | | |
| BULCHU2204 | Language Lab | - | - | 2 | |  | | 60 | 40 | | 100 | 1 | |
| **E** | **Skill Enhancement Courses (SEC)** | | | | | | | | | | | | |
| BULCSE2201 | Skill Enhancement Generic Course –II | **-** | **-** | **2** | |  | | **60** | **40** | | **100** | **1** | |
| **F** | **Value Added Courses (VAC)** | | | | | | | | | | | | |
| BUVCSA2102 | Environment & Sustainability | **2** | **-** | **-** | |  | | **40** | **60** | | **100** | **2** | |
| **G** | **Summer Internship / Research Project / Dissertation** | | | | | | | | | | | | |
|  | - | - | - | - |  | | | - | | - | - | - | |
| **Total** | | **18** | - | **12** | **6\*** | | |  | |  |  |  | |
| **Total Teaching Hours** | | **30/36** | | |  | | |  | |  |  | **24** | |

SH: Supporting Hours

* Classes will be conducted fortnight on I,III and IV Monday

| **POORNIMA UNIVERSITY, JAIPUR**  **Faculty of Computer Science and Engineering** | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Name of Program :BCA with Minor in Artificial Intelligence and Data Science Duration: 3 years Total Credits: 131** | | | | | | | | | | | | |
| **Teaching Scheme for Batch 2023-26** | | | | | | | | | | | | |
| **Semester-III** | | | | | | | | | | | | |
| **Course Code** | **Name of Course** | **Teaching Scheme** | | |  | | **Marks Distribution** | | | | | **Credits** |
| **Lecture (L)** | **Tutorial (T)** | **Practical**  **(P)** | **SH** | | **IE** | | **ESE** | **Total** | |
| **A.** | **Major (Core Courses)** | | | | | | | | | | | |
| **A.1** | **Theory** |  |  |  |  | |  |  | |  | |  |
| BCACCA3101 | Relational Database Management System | **3** |  |  | **1\*** | | **40** | **60** | | **100** | | **3** |
| BCACCA3102 | OOPS with Java | **3** |  |  | **1\*** | | **40** | **60** | | **100** | | **3** |
| BCACCA3103 | Data Structure and Algorithm | **3** | **-** | **-** | **1\*** | | **40** | **60** | | **100** | | **3** |
| BCACCA3104 | Computer Organization and Architecture | **3** | **-** | **-** | **1\*** | | **40** | **60** | | **100** | | **3** |
| **A.2** | **Practical** |  |  |  |  | |  |  | |  | |  |
| BCACCA3201 | Relational Database Management System Lab | - | - | **2** |  | | **60** | **40** | | **100** | | **1** |
| BCACCA3202 | OOPS with Java Lab | - | - | **2** |  | | **60** | **40** | | **100** | | **1** |
| BCACCA3203 | Data Structure and Algorithm Lab | - | - | **2** |  | | **60** | **40** | | **100** | | **1** |
| **B.** | **Minor Stream Courses** | | | | | | | | | | | |
| **B.1** | **Theory** |  |  |  |  | |  |  | |  | |  |
| BCTCCA3101 | Principles of Virtualization | 3 | - | - | **1\*** | | **40** | **60** | | **100** | | **3** |
| **B.2** | **Practical** |  |  |  |  | |  |  | |  | |  |
| BCTCCA3201 | Principles of Virtualization Lab | - | - | **2** |  | | **60** | **40** | | **100** | | **1** |
| **C** | **Multidisciplinary Courses** | | | | | | | | | | | |
| BCAEMC3121 | MOOC Course-II | **1** | \_ | \_ | 1\* | |  |  | |  | | **1** |
| **D** | **Ability Enhancement Courses (AEC)** | | | | | | | | | | | |
| BULCHU3208 | Communication Skills-I | **-** | **-** | **2** |  | | **60** | **40** | | **100** | | **1** |
| **E** | **Skill Enhancement Courses (SEC)** | | | | | | | | | | | |
| BULCSE3201 | Skill Enhancement Generic Course –III | - | - | 2 |  | | **60** | **40** | | | **100** | **1** |
| **F** | **Value Added Courses (VAC)** | | | | | | | | | | | |
| BUVCCE3101 | Digital Marketing | **2** | - | **-** | |  | **60** | **40** | | **100** | | **2** |
| **G** | **Summer Internship / Research Project / Dissertation** | | | | | | | | | | | |
|  | NIL | - | - | - |  | | - | - | | - | | - |
| **Total** | | **18** | - | **12** | 6\* | |  |  | |  | |  |
| **Total Teaching Hours** | | **30/36** | | |  | |  |  | |  | | **24** |

SH: Supporting Hours

* Classes will be conducted fortnight on I,III and IV Monday

| **POORNIMA UNIVERSITY, JAIPUR**  **Faculty of Computer Science and Engineering** | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Name of Program : BCA with Minor in Artificial Intelligence and Data Science Duration: 3 years Total Credits: 131** | | | | | | | | | | | | | | | |
| **Teaching Scheme for Batch 2023-26** | | | | | | | | | | | | | | | |
| **Semester-IV** | | | | | | | | | | | | | | | |
| **Course Code** | **Name of Course** | **Teaching Scheme** | | | | |  | **Marks Distribution** | | | | | | **Credits** | |
| **Lecture (L)** | **Tutorial (T)** | | **Practical**  **(P)** | | **SH** | **IE** | | **ESE** | | **Total** | |
| **A.** | **Major (Core Courses)** | | | | | | | | | | | | | | |
| **A.1** | **Theory** |  |  | |  |  | |  | |  | |  | | |  |
| BCACCA4101 | Big Data Analysis | **3** | - | | - | **1\*** | | **40** | | **60** | | **100** | | | **3** |
| BCACCA4102 | Design and Analysis of Algorithm | **3** | - | | - | **1\*** | | **40** | | **60** | | **100** | | | **3** |
| **A.2** | **Practical** |  |  | |  |  | |  | |  | |  | | |  |
| BCACCA4201 | Big Data Analysis Lab | - | - | | **2** |  | | **60** | | **40** | | **100** | | | **1** |
| BCACCA4202 | Design and Analysis of Algorithm Lab | - | - | | **2** |  | | **60** | | **40** | | **100** | | | **1** |
| **B.** | **Minor Stream Courses** | | | | | | | | | | | | | | |
| **B.1** | **Theory** |  |  | |  |  | | |  |  | | |  | |  |
| BCTCCA4101 | Cloud Web Services | **3** | - | | - | **1\*** | | | **40** | **60** | | | **100** | | **3** |
| BCTCCA4102 | Network Administration | **3** | - | | - | **1+1\*** | | | **40** | **60** | | | **100** | | **3** |
| **B.2** | **Practical** |  |  | | - |  | | |  |  | | |  | |  |
| BCTCCA4201 | Cloud Web Services Lab | - | - | | **2** |  | | | **60** | **40** | | | **100** | | **1** |
| BCTCCA4202 | Network Administration Lab | - | - | | **2** |  | | | **60** | **40** | | | **100** | | **1** |
| **C** | **Multidisciplinary Courses** | | | | | | | | | | | | | | |
| BCAEMC4121 | MOOC Course-III | **1** | - | | - | 1\* | | | - | - | | |  | | **1** |
| **D** | **Ability Enhancement Courses (AEC)** | | | | | | | | | | | | | | |
| BULCHU4109 | Negotiation skills & Persuasive Communication | **2** | **-** | | **-** |  | | | **40** | **60** | | | **100** | | **2** |
| **E** | **Skill Enhancement Courses (SEC)** | | | | | | | | | | | | | | |
| BULCSE4201 | Skill Enhancement Generic Course –IV | **-** | **-** | | **2** |  | | | **60** | **40** | | | **100** | | **1** |
| **F** | **Value Added Courses (VAC)** | | | | | | | | | | | | | | |
| BUVCCE4102 | Business Intelligence | **2** | - | **-** | |  | | | **40** | | **60** | | **100** | | **2** |
| **G** | **Summer Internship / Research Project / Dissertation** | | | | | | | | | | | | | | |
| BCACCA4401 | Industrial Training Seminar-1 | **-** | **-** | **2** | | **1\*** | | | **60** | **40** | | | **100** | | **1** |
| **Total** | | **17** | **-** | **12** | | **1+6\*** | | | **-** | **-** | | | **-** | |  |
| **Total Teaching Hours** | | **30/ 36** | | | |  | | |  |  | | |  | | **23** |

SH: Supporting Hours

* Classes will be conducted fortnight on I,III and IV Monday

| **POORNIMA UNIVERSITY, JAIPUR**  **Faculty of Computer Science and Engineering** | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Name of Program : BCA with Minor in Artificial Intelligence and Data Science Duration: 3 years Total Credits: 131** | | | | | | | | | | | | | | |
| **Teaching Scheme for Batch 2023-26** | | | | | | | | | | | | | | |
| **Semester-V** | | | | | | | | | | | | | | |
| **Course Code** | **Name of Course** | **Teaching Scheme** | | |  | **Marks Distribution** | | | | | | | **Credits** | |
| **Lecture (L)** | **Tutorial (T)** | **Practical**  **(P)** | **SH** | **IE** | | **ESE** | | | **Total** | |
| **A.** | **Major (Core Courses)** | | | | | | | | | | | | | |
| **A.1** | **Theory** |  |  |  |  |  | |  | | |  | |  | |
| BASCCA5101 | Advanced Data Structure | **3** | - | - | **1\*** | **40** | | **60** | | | **100** | | **3** | |
| **A.2** | **Practical** |  |  |  |  |  | |  | | |  | |  | |
| **B.** | **Minor Stream Courses** | | | | | | | | | | | | | |
| **B.1** | **Theory** |  |  |  |  |  | |  | | | |  | |  |
| BCTCCA5101 | Cloud Deployment | **3** |  | **-** | **1\*** | **40** | | **60** | | | | **100** | | **3** |
| BCTCCA5102 | Cloud Container | **3** |  | **-** | **1\*** | **40** | | **60** | | | | **100** | | **3** |
| BCTCCA5103 | Cryptography and Cloud Security | **3** |  | **-** |  | **40** | | **60** | | | | **100** | | **3** |
| BCTCCA5104 | Advanced Cloud Technology | **3** |  | **-** | **1\*** | **40** | | **60** | | | | **100** | | **3** |
| **B.2** | **Practical** |  |  |  |  |  | |  | | | |  | |  |
| BCTCCA5201 | Cloud Deployment Lab | **-** | **-** | **2** |  | **60** | | **40** | | | | **100** | | **1** |
| BCTCCA5202 | Cloud Container Lab | **-** | **-** | **2** |  | **60** | | **40** | | | | **100** | | **1** |
| BCTCCA5203 | Cryptography and Cloud Security Lab | **-** | **-** | **2** |  | **60** | | **40** | | | | **100** | | **1** |
| **C** | **Multidisciplinary Courses** | | | | | | | | | | | | | |
| BCAEMC5121 | MOOC Course-IV | **1** | - | - | 1\* | | 60 | | 40 | | 100 | | **1** | |
| **D** | **Ability Enhancement Courses (AEC)** | | | | | | | | | | | | | |
| BULCHU5115 | Entrepreneurial & Managerial Skills | **2** | **-** | **-** |  | | **60** | | **40** | | **100** | | **2** | |
| **E** | **Skill Enhancement Courses (SEC)** | | | | | | | | | | | | | |
| BULCSE5201 | Skill Enhancement Generic Course –V | - | - | **2** |  | | **60** | | **40** | | **100** | | **1** | |
| **F** | **Value Added Courses (VAC)** | | | | | | | | | | | | | |
| BUVCCE5102 | Internet of Things | **2** | - | **-** |  | | **60** | | | **40** | **100** | | **2** | |
| **G** | **Summer Internship / Research Project / Dissertation** | | | | | | | | | | | | | |
| BCACCA5401 | Industrial Training Seminar-II |  |  | **2** | **1\*** | | **60** | | **40** | | **100** | | **1** | |
| **Total** | | **20** | **-** | **10** | **6\*** | |  | |  | |  | |  | |
| **Total Teaching Hours** | | **30/36** | | |  | |  | |  | |  | | **25** | |

SH: Supporting Hours

* Classes will be conducted fortnight on I,III and IV Monday

| **POORNIMA UNIVERSITY, JAIPUR**  **Faculty of Computer Science and Engineering** | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Name of Program : BCA with Minor in Artificial Intelligence and Data Science Duration: 3 years Total Credits: 131** | | | | | | | | | | |
| **Teaching Scheme for Batch 2023-26** | | | | | | | | | | |
| **Semester-VI** | | | | | | | | | | |
| **Course Code** | **Name of Course** | **Teaching Scheme** | | | **Marks Distribution** | | | | | **Credits** |
| **Lecture (L)** | **Tutorial (T)** | **Practical**  **(P)** | **IE** | **ESE** | | | **Total** |
| **A.** | **Major (Core Courses)** | | | | | | | | | |
| **A.1** | **Theory** |  |  |  |  |  | | |  |  |
| BCACCA6101 | IPR and Patent | **3** | - | - | **40** | **60** | | | **100** | **3** |
| **A.2** | **Practical** |  |  |  |  |  | | |  |  |
| **B.** | **Minor Stream Courses** | | | | | | | | | |
| **B.1** | **Theory** |  |  |  |  | | |  |  |  |
| BCTCCA6101 | Cloud migration and Data Center | **3** | **-** | **-** | **40** | | | **60** | **100** | **3** |
| **B.2** | **Practical** |  |  |  |  | | |  |  |  |
| BCTCCA6201 | Cloud migration and Data Center Lab | **-** | **-** | **2** | **60** | | | **40** | **100** | **1** |
| **C** | **Multidisciplinary Courses** | | | | | | | | | |
|  |  |  |  |  |  | | |  |  |  |
| **D** | **Ability Enhancement Courses (AEC)** | | | | | | | | | |
| BULCHU6120 | Presentation and Interview Skills | 2 | - | - | **40** | | | **60** | **100** | **2** |
| **E** | **Skill Enhancement Courses (SEC)** | | | | | | | | | |
| BULCSE6201 | Skill Enhancement Generic Course –VI | - | - | **2** | **60** | | | **40** | **100** | **1** |
| **F** | **Value Added Courses (VAC)** | | | | | | | | | |
|  | NIL |  |  |  |  | |  | |  |  |
| **G** | **Summer Internship / Research Project / Dissertation** | | | | | | | | | |
| BCACCA6501 | Project/Internship | **-** | **-** | **4** | **60** | | | **40** | **100** | **2** |
| **Total** | | **8** | - | **8** |  | | |  |  |  |
| **Total Teaching Hours** | | **16** | | |  | | |  |  | **12** |

**Major (Core Courses)**

**Theory**

**Code: BCACCA1101 Programming Fundamentals of C 3 Credits [LTP: 3-0-0]**

**COURSE OUTCOME**

Students will be able to:

* Learn data types, loops, functions, array, pointers, string, structures and files.
* Develop conditional and iterative statements to write C programs.
* Implement concept of string using array.
* Allocate memory dynamically using pointers.
* Apply C Programming to solve real time problems.

1. **OUTLINE OF THE COURSE**

|  |  |  |
| --- | --- | --- |
| **Unit No.** | **Title of The Unit** | **Time required for the Unit (Hours)** |
| **1.** | **Introduction to C Programming** | **6** |
| **2.** | **Decision Making & Looping** | **6** |
| **3.** | **Array and string** | **8** |
| **4.** | **Advance programming in C** | **8** |
| **5.** | **File handling & Additional features** | **8** |

1. **DETAILED SYLLABUS**

|  |  |
| --- | --- |
| **Unit** | **Unit Details** |
| **1.** | **Introduction to C Programming** |
|  | * Introduction of Unit * Introduction to computer-based problem solving, Program design and implementation issues- Flowcharts & Algorithms. * Types of Languages – Machine language, assembly language, high level languages, Assemblers, Compilers, Interpreters. * Overview of C, Data Types, Constants & Variables, Literals, Operators & Expressions * Conclusion & Real Life Application |
| **2.** | **Decision Making & Looping** |
|  | * Introduction of Unit * Decision making in C- if statement, if-else statement, Nested if statement, if else if Ladder, Switch case * Loop control in C – for loop, while loop, do-while loop * Control flow in C- break, continue and goto statement. * Conclusion & Real Life Application |
| **3.** | **Array and string** |
|  | * Introduction of Unit * Array- 1D array, 2D array and dynamic array * Scope rules- Local & global variables. * Functions-parameter passing, call by value and call by reference, calling functions with arrays, command line argument, recursion- basic concepts. * String – String in-build functions. * Conclusion of the Unit |
| **4.** | **Advance programming in C** |

|  |  |
| --- | --- |
|  | * Introduction of Unit * Pointers- The & and \* operator, pointer expression, assignments, arithmetic, comparison, arrays of pointers, pointers to pointers, initializing pointers, pointers to functions, function retuning pointers. * Structures- Basics, declaring, referencing structure elements, array of structures, passing structures to * functions, structure pointers, arrays and structures within structures, typedef. * Unions – Declaration, uses * Enumerated data-types * Conclusion of the Unit |
| 5. | **File handling Additional features &** |
|  | * Introduction of Unit * File Handling – The file pointer, file accessing functions-fopen, fclose, putc, getc, fprintf, reading and writing into a file * Advance features- storage classes and dynamic memory allocation * C Preprocessor- #define, #include, #undef, Conditional compilation directives. * C standard library and header files: Header files, string functions, mathematical functions, Date and Time functions. * Conclusion of the Unit |

1. **RECOMMENDED STUDY MATERIAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Text Books:** | **Author** | **Edition** | **Publication** |
| 1. | Let us C, 6th Edition | Yashwant Kanitkar | th  6 Edition | PBP Publication |
| 2. | The C programming Language | Richie and Kenninghan | 2004 | BPB Publication, |
| 3. | Programming in ANSI C 3rdEdition, 2005 | E.Balagurusamy | 3 Edition, 2005 | Programming in ANSI C |
| **Reference Book** | | | | |
| 1. | The C programming Language Richie and Kenninghan PBP Publication,2004 | | | |
| 2. | Programming in ANSI C 3rd Edition, 2005 Balaguruswmy Tata McGraw Hill | | | |
| **Online Resources** | | | | |
| 1. | <https://www.programiz.com/c-programming/examples> | | | |
| 2. | <https://www.w3resource.com/c-programming-exercises> | | | |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - |
| **CO2** | - | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO4** | - | 3 |  | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO5** | - | 2 | 2 | 3 | 1 | - | - | - | - | - | - | - | - | - | - |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Code: BCACCA1102 Operating System 3 Credits [LTP: 3-0-0]**

**COURSE OUTCOME**

Students will be able to:

* + Know structure and organization of the file system.
  + Get concept what a process is and how processes are synchronized and scheduled.
  + Acquire different approaches to memory management.
  + Use system calls for managing processes, memory and the file system.
  + Know the data structures and algorithms used to implement an OS.

1. **OUTLINE OF THE COURSE**

|  |  |  |
| --- | --- | --- |
| **Unit No.** | **Title of The Unit** | **Time required for the Unit (Hours)** |
| **1** | **Operating System Overview** | **08** |
| **2** | **Process Management** | **08** |
| **3** | **Process Deadlocks** | **08** |
| **4** | **Memory Management** | **09** |
| **5** | **File Management** | **07** |

1. **DETAILED SYLLABUS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit** | **Unit Details** | | |
| **1.** | **Operating System Overview** | | |
|  | * Introduction of Unit * Definition, Two views of operating system, Evolution of operating system, Types of OS. * System Call, Handling System Calls, System Programs, Operating System Structures, * The Shell, Open Source Operating Systems * Conclusion of Unit | | |
| **2.** | **Process Management** | | |
|  | * Introduction of Unit * Process v/s Program, Multi-programming, Process Model, Process States, Process Control Block. * Threads, Thread v/s Process, User and Kernel Space Threads. * Inter Process Communication, Race Condition, Critical Section * Implementing Mutual Exclusion: Mutual Exclusion with Busy Waiting * Interrupts, Lock Variables, Strict Alteration, Peterson‘s Solution, Test and Set Lock. * Sleep and Wake-up, Semaphore, Monitors, Message Passing. * Classical IPC problems: Producer Consumer, Sleeping Barber, Dining Philosopher Problem * Process Scheduling: Goals, Batch System Scheduling (First-Come First-Served, Shortest Job First, Shortest Remaining Time Next), Interactive System Scheduling (Round-Robin Scheduling, Priority Scheduling, Multiple Queues), Overview of Real Time System Scheduling * Conclusion of Unit | | |
| **3.** | **Process Deadlocks** | | |
|  | * Introduction of Unit * Introduction, Deadlock Characterization, Preempt able and Non-preempt able Resources * Resource – Allocation Graph, Conditions for Deadlock. | | |
|  | | * Handling Deadlocks: Ostrich Algorithm, Deadlock prevention, Deadlock Avoidance. * Deadlock Detection (For Single and Multiple Resource Instances), Recovery From * Deadlock (Through Preemption and Rollback) * Conclusion of Unit |
| **4.** | | **Memory Management** |
|  | | * Introduction of Unit * Introduction, Monoprogramming vs. Multi-programming, Modeling Multiprogramming, Multiprogramming with fixed and variable partitions, Relocation and Protection. * Memory management (Bitmaps & Linked-list), Memory Allocation Strategies * Virtual memory: Paging, Page Table, Page Table Structure, Handling Page Faults, TLB‘s * Page Replacement Algorithms: FIFO, Second Chance, LRU, Optimal, LFU, Clock, WS- Clock, Concept of Locality of Reference, Belady‘s Anomaly * Segmentation: Need of Segmentation, its Drawbacks, Segmentation with Paging(MULTICS) * Conclusion of Unit |
| **5.** | | **File Management** |
|  | | * Introduction of Unit * File Overview: File Naming, File Structure, File Types, File Access, File Attributes, File Operations, Single Level, two Level and Hierarchical Directory Systems, File System Layout. * Implementing Files: Contiguous allocation, Linked List Allocation, Linked List * Allocation using Table in Memory, Inodes. * Directory Operations, Path Names, Directory Implementation, Shared Files * Free Space Management: Bitmaps, Linked List * Conclusion of Unit |

1. **RECOMMENDED STUDY MATERIAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Text Books:** | **Author** | **Edition** | **Publication** |
| 1 | Operating system concepts | Silberschatz, Galvin,  Gagne | 8th  edition | John Wiley and Sons |
| 2 | Modern Operating System | A.S.Tanenbaum | 2nd  Edition | Pearson |
| **Reference Books** | | | | |
| 1. | Operating Systems-S Halder, Alex A Aravind Pearson Education Second Edition 2016. | | | |
| **Online Resources** | | | | |
| 1. | <https://www.coursera.org/courses?query=operating%20system> | | | |
| 2. | [https://hackr.io › tutorials › learn-operating-systems](https://hackr.io/tutorials/learn-operating-systems) | | | |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - |
| **CO2** | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** |  | - | 2 | 2 | - | - | - | - | - | - | - | - | - | - | - |
| **CO4** | 2 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - |
| **CO5** |  | 3 | 2 | 3 | 1 | - | - | - | - | - | - | - | - | - | - |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Code: BCACCA1103 Computer Fundamental and Office Automation 3 Credit [LTP: 3-0-0]**

**COURSE OUTCOME**

Students will be able to:

CO1: Understand the basics of computer systems and its components.

CO2: Possess the knowledge of operating systems.

CO3: Understand and apply the basic concepts of a word processing package.

CO4: Understand and apply the basic concepts of electronic spreadsheet software.

CO5: Understand and create a presentation using PowerPoint tool.

1. **OUTLINE OF THE COURSE**

|  |  |  |
| --- | --- | --- |
| **Unit No.** | **Title of The Unit** | **Time required for the Unit (Hours)** |
| **1.** | Fundamentals of computer | 08 |
| **2.** | Operating system (Windows XP) | 06 |
| **3.** | Word Processing | 08 |
| **4.** | Excel Spreadsheet | 08 |
| **5.** | PowerPoint Presentations | 06 |

1. **DETAILED SYLLABUS**

|  |  |
| --- | --- |
| **Unit** | **Unit Details** |
| **1.** | **Fundamentals of computer** |
|  | * Introduction to Fundamentals of computer * Overview Of a Computer * Functional Components of a computer (Working of each unit) * Evolution Of Computers, Generations Of Computers, Classification Of Computers, Applications Of Computers * Hardware: Block diagram of computer, Input and Output devices, Memory and storages devices, Different ports and its uses, Different type of printers * Conclusion of unit |
| **2.** | **Operating system (Windows XP)** |
|  | * Introduction to Operating system (Windows XP) * Windows concepts, Features * Windows Structure, Desktop, Task bar, Start Menu, My Computer, Recycle Bin * Windows Accessories, calculator, Notepad, Paint, Word pad, Character Map * Windows Explorer, Entertainment, * Installation of Hardware and Software * Using scanner, system tools, communication, sharing information between computers * Conclusion of unit |
| **3.** | **Word Processing** |
|  | * Introduction to Word Processing * Typing, Editing, Proofing & Reviewing * Formatting Text & Paragraphs * Automatic Formatting and Styles * Working with Tables, Graphics and Frames * Mail Merge * Automating Your Work * printing Documents * Conclusion of unit |
| **4.** | **Excel Spreadsheet** |
|  | * Introduction to Excel Spreadsheet * Working & Editing In Workbooks * Creating Formats & Links * Formatting a Worksheet & creating graphic objects * Creating Charts (Graphs) * Formatting and analyzing data * Organizing Data in a List (Data Management) * Sharing & Importing Data, Printing. * Conclusion of unit |
| **5.** | **Power Point Presentations** |
|  | * Introduction to PowerPoint Presentations * Getting started in PowerPoint * Creating a presentation, Creating & editing slides * Previewing a slide show * Adding picture & graph * Adding sound & video * Adding auto shape * Animating objects. * Conclusion of unit |

* 1. **RECOMMENDED STUDY MATERIAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Text Books:** | **Author** | **Edition** | **Publication** |
| 1. | Digital Logic and Computer Design | M.M. Mano | Thirteenth Impression | Pearson Education |
| 2. | Fundamentals of Computers | V. Rajaraman | 3rd Edition | PHI New Delhi |
| **Reference Book** | | | | |
| 1. | Microsoft Office 2003: The Complete Reference, McGraw-Hill Inc. | | | |
| 2. | T.C. Bartee, 1991, Computer Architecture and Logical Design, McGraw Hill. | | | |
| 3. | Microsoft Office 2000- Training Guide, Maria Reid-Karl Schwartz, Diana Rain, BPB Publications | | | |
| **Online Resources** | | | | |
| 1. | <https://www.tutorialspoint.com/computer_fundamentals/index.htm> | | | |
| 2. | <https://onlinecourses.swayam2.ac.in/cec19_cs06/preview> | | | |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - |
| **CO2** | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | 3 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO4** | 1 | 2 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - |
| **CO5** | 2 |  | 2 |  | 2 | - | - | - | - | - | - | - | - | - | - |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Code: BCACCA1104 Introduction to Web Technology 3 Credits [LTP: 3-0-0]**

**COURSE OUTCOME:**

Students will be able to:

* + Create an effective web page, including an in-depth consideration of information architecture.
  + Become familiar with graphic design principles that relate to web design and learn how to implement theories into practice.
  + Develop skills in analyzing the usability of a web site.
  + Plan and conduct user research related to web usability.
  + Apply HTML & CSS to solve real time web problems.

1. **OUTLINE OF THE COURSE**

|  |  |  |
| --- | --- | --- |
| **Unit No.** | **Title of the unit** | **Time required for the**  **Unit(Hours)** |
| **1.** | **Introduction to HTML And Internet** | **8** |
| **2.** | **HTML & CSS** | **8** |
| **3.** | **HTML5, CSS3** | **8** |
| **4.** | **XML** | **6** |
| **5.** | **Practical Website Development** | **6** |

1. **DETAILED SYLLABUS**

|  |  |
| --- | --- |
| **Unit** | **Unit Details** |
| **1.** | **Introduction to HTML And Internet** |
|  | * Introduction, History of internet, Internet Design Principles, Internet Protocols - FTP,TCP/IP, SMTP, Telnet, etc., Client Server Communication, Web System architecture * Evolution of the Web, Web architectures, Web clients and servers, Static and Dynamic Web Applications, Front end and back end web development. * HTML, CSS, JS, XML; HTTP, secure HTTP, etc; URL, Web Services – SOAP, REST * Conclusion of the Unit |
| **2.** | **HTML & CSS** |
|  | * Introduction to Html, Html Document structure, Html Editors, Html element/tag & attributes, Designing simple page - Html tag, Head tag, Body tag; * More HTML Tags - Anchor tag, Image tag, Table tag, List tag, Frame tag, Div tag ; Html forms - Input type, Text area, Select , Button, Images. * Introduction to CSS, Syntax, Selectors ,Embedding CSS to Html, Formatting fonts, Text & background color, Inline styles, External and Internal Style Sheets, Borders & boxing * Conclusion of the Unit |
| **3.** | **HTML5, CSS3** |
|  | * Introduction to HTML5. * Introduction to CSS3, New features, Local storage, Web Sockets, Server events, Canvas, * Audio & Video, Geolocation, Microdata, Drag and Drop. Browser life cycle and browser rendering stages. Service workers * Conclusion of the Unit |
| **4.** | **XML** |
|  | * Introduction to XML * Difference b/w Html & XML, XML editors. * XML Elements & Attributes XML DTD. * XML Schema, XML Parser. * Document Object Model (DOM), XML DOM. * Conclusion of the Unit |
| **5.** | **Practical website development** |
|  | * Commonly used Web Servers and browsers, Setting up a server and domain name, website types and structures, * Web authoring tools, Web hosting, website maintenance, generating traffic to your website. * Conclusion of the Unit |

1. **RECOMMENDED STUDY MATERIAL:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.**  **No** | **Text Books:** | **Author** | **Edition** | **Publication** |
| **1** | Practical Web Design for  Absolute Beginners | AdrianW. West | 2016 | Apress 2016 |
| **2** | Introducing Web  Development | Jorg Krause | 2017 | Apress2017 |
| **3** | HTML & CSS:The  Complete Reference | Thomas Powell | 2010  Fifth Edition | McGrawHill |
| **Reference Book** | | | | |
| 1 | [HTML and CSS: Design and Build Websites – by Jon Duckett](https://www.amazon.com/HTML-CSS-Design-Build-Websites/dp/1118008189/?tag=codeinwp0d3-20) | | | |
| 2 | [Head First HTML and CSS: A Learner‘s Guide to Creating Standards-Based Web Pages – by Elisabeth Robson](https://www.amazon.com/Head-First-HTML-CSS-Standards-Based/dp/0596159900/?tag=codeinwp0d3-20)  [& Eric Freeman](https://www.amazon.com/Head-First-HTML-CSS-Standards-Based/dp/0596159900/?tag=codeinwp0d3-20) Publisher- ORELLY | | | |
| **Online Resources** | | | | |
| 1 | <https://www.w3schools.com/html/html_links.asp> | | | |
| 2 | <https://www.tutorialrepublic.com/html-tutorial/html-links.php> | | | |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | - | 3 | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO2** | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO4** | 2 | 3 | 3 | 2 | 2 |  | - | - | - | - | - | - | - | - | - |
| **CO5** | - | - | 3 |  | - | - | - | - | - | - | - | - | - | - | - |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**PRACTICAL**

**Code: BCACCA1201 Programming Fundamentals of C Lab 1 Credit [LTP: 0-0-2]**

**Course Outcome: -**

Students will be able to:

* + Gain concept of functional hierarchical code organization.
  + Work with textual information, characters and strings
  + Implement file handling concepts
  + Implement real time applications using the power of C language features.
  + Overcome and solve possible errors during program execution.
  1. **LIST OF EXPERIMENTS:**

|  |  |
| --- | --- |
| **1** | Given the values of the variables x, y and z, write a program to rotate their values such that x has the value of y, y has the value of z, and z has the value of x |
| **2** | Write a program that reads a floating point number and then displays the right-most digit of the integral part of the number. |
| **3** | Write a C program to calculate the sum of digits of given number. |
| **4** | Program to find largest and smallest number from four given number. |
| **5** | Program to find whether a year is leap or not |
| **6** | Write a C program in which enter any number by the user and perform the operation of Sum of digits of entered number. |
| **7** | Write a C Program to convert Decimal number to Binary number |
| **8** | Find the sum of this series upto n terms  1+2+3+4+5+6+……….. |
| **9** | Program to print Armstrong‘s numbers from 1 to 100. |
| **10** | Write a program to convert years into Minute, Hours, Days, Months, Seconds using switch () statements |
| **11** | Write a C menu driven program |
| **12** | Write a program to generate the various pattern of numbers |
| **13** | Write a C Program to print the reverse of an integer number |
| **14** | Write a C program to perform the factorial of given number |
| **15** | Write a C program in which a function prime that returns 1 if its argument is a prime and return zero otherwise. |
| **16** | Write a C program to calculate factorial of a number using recursion. |
| **17** | Write a C program in which enter 10 elements by the user and perform the operation of sorting in ascending order |
| **18** | Write a C program to perform to perform Matrix addition and multiplication operations. |

|  |  |
| --- | --- |
| **19** | Write a program to determine the length of the string and find its equivalent ASCII codes. |
| **20** | Write a program to delete all the occurrences of the vowels in a given text. Assume that the text length will be of one line |
| **21** | Write a program to maintain the library record for 100 books with book name, author‘s name, and edition, year of publishing and price of the book. |

* 1. **RECOMMENDED STUDY MATERIAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Text Books:** | **Author** | **Edition** | **Publication** |
| 1. | Let us C | Yashwant Kanetkar | 6th Edition | PBP Publication |
| 2. | The C programming Language | Richie and Kenninghan | 2nd Edition  2004 | PBP  Publication,2004 |
| 3. | Programming in ANSI C | E Balaguruswamy | 3rd Edition,  2005 | Tata McGraw Hill |
| **Reference Book** | | | | |
| 1. | The C programming Language by Richie and Kenninghan, PBP Publication,2004 | | | |
| 2. | Programming in ANSI C 3rd Edition, 2005 byE.Balagurusamy, Tata McGraw Hill | | | |
| **Online Resources** | | | | |
| 1. | <https://www.programiz.com/c-programming/examples> | | | |
| 2. | <https://www.w3resource.com/c-programming-exercises> | | | |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | 2 | 2 | 2 | 1 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO4** | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO5** | - | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | - | - | - |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Course Outcome: -**

**Code: BCACCA1202 Operating System Lab 1 Credit [LTP: 0-0-2]**

Students will be able to:

* + Implement basic Scheduling algorithms and memory allocation techniques.
  + Implement memory management techniques like MVT and MFT
  + Implement memory allocation algorithms.
  + Detect deadlocks and avoid them.
  + Implement different page replacement algorithms

1. **LIST OF EXPERIMENTS:**

|  |  |
| --- | --- |
| 1. | Write a C program to simulate the following non-preemptive CPU scheduling algorithms to find turnaround time and waiting time. a) FCFS b) SJF c) Round Robin d) Priority |
| 2. | Write a C program to simulate the following file allocation strategies. a) Sequential b) Indexed c) Linked |
| 3. | Write a C program to simulate multi-level queue scheduling algorithm considering the following scenario. All the  processes in the system are divided into two categories – system processes and user processes. System processes are to be given higher priority than user processes. Use FCFS scheduling for the processes in each queue |
| 4. | Write a C program to simulate the MVT and MFT memory management techniques. |
| 5. | Write a C program to simulate the following contiguous memory allocation techniques a) Worst-fit b) Best-fit c) First-fit |
| 6. | Write a C program to simulate paging technique of memory management |
| 7. | Write a C program to simulate Bankers algorithm for the purpose of deadlock avoidance. |
| 8. | Write a C program to simulate disk scheduling algorithms a) FCFS b) SCAN c) C-SCAN |
| 9. | Write a C program to simulate page replacement algorithms a) FIFO b) LRU c) LFU |
| 10. | Write a C program to simulate page replacement algorithms |
| 11. | Write a C program to simulate producer-consumer problem using semaphores. |
| 12. | Write a C program to simulate the concept of Dining-Philosophers problem. |

1. **RECOMMENDED STUDY MATERIAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Text Books:** | **Author** | **Edition** | **Publication** |
| 1. | Operating system concepts | Silberschatz, Galvin,  Gagne | 8thEdition | John Wiley and Sons |
| 2. | Modern Operating System | A.S.Tanenbaum | 2nd  Edition | Pearson |
| **Reference Book** | | | | |
| 1. | Operating Systems-S Halder, Alex A Aravind Pearson Education Second Edition 2016. | | | |
| **Online Resources** | | | | |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | - | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - | - |
| **CO4** | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO5** | - | 3 | 2 | 1 | 1 | - | - | - | - | - | - | - | - | - | - |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Code: BCACCA1203 Office Automation Lab 1 Credit [LTP: 0-0-2]**

**Course Outcome: -**

Students will be able to:

* + Prepare document in MS word using pictures and editing properly.
  + Construct forms in MS. Word
  + Protect a document from unauthorized access by assigning password
  + Prepare worksheet to keep records and how to use mathematical formula in same
  + Present a Presentation using MS Power point

1. **LIST OF EXPERIMENTS:**

|  |  |
| --- | --- |
| **1** | **MS Word**  Prepare a document about any tourist destination of your choice with appropriate pictures and editing  features. |
| **2** | **Prepare a News Paper Layout. Insert appropriate pictures wherever necessary. Use the following** Features:   * Three Column and Four Column setting * Set One or Two Advertisements * Use Bullets and Numbering. |
| **3** | **Create a Document consisting of Bio-data. It includes**   * A table giving your qualification and /or experience of work. Table should be Bordered and Shaded. * A Multilevel list giving your areas of interest and further areas of interest. The sub areas should be numbered as 'a','b', etc while the area should be numbered as '1','2',etc. * The information should be divided in ―General‖ and ―Academic‖ sections. * The header should contain ―BIO-DATA ‖while the footer should have page numbers in the format Page1of 10. * Assign a password for the document to protect it from unauthorized access. |
| **4** | Assume that you are coordinating a seminar in your organization. Write a letter to 10 different IT companies asking them to participate in the seminar using mail merge facility. |
| **5** | Prepare a document which contains template of marks card of students. Assume that there are 10 students. The footer for the document should be 'Poornima University Jaipur'. |
| **6** | Prepare a document about any topic In mathematics which uses mathematical symbols. (At least 5 mathematical symbols should be used). Assign a password for the document to protect it from  unauthorized access. Demonstrate the use of Hyperlink Option. Sets margins to your document, a font of size and double spaced document |
| **7** | **MS-Excel**  Open a new work book, save it as JavaCoffeeBar.xls. In sheet 1 write following sales data for JavaCoffee bar to show their first 6 months sales.   * Select cell B4:D4 and change the horizontal alignment to center and text to 90degree. * All titles should be in bold * Format all cells numbers to currency style and adjust width as necessary. * Add border to data.. |
| **8** | Prepare a worksheet to maintain student information. The work sheet should Contain Roll Number, Name and marks in 5 subjects. (Max Marks is 100).Validate the marks. Calculate the total marks. Assign the grade according to the following. Assign grade 'A' if the total marks is above 450. From 401 to 449 assign the grade as 'B'. From 351 to 400 assign the Grade as 'C'. From 300 to 350 the grade to be assigned is 'D'. For the total marks less than 300 No grade is assigned. A student is eligible to get a grade only when he gets 40 and above in all the subjects. In such cases the grade is―FAIL‖.(Assume  that there are 10 students) |
| **9** | Prepare a pay-bill using a worksheet. The work sheet should contain Employee Id, Name ,Designation, |
|  | Experience and Basic Salary and Job ID. If Job Id is 1 then DA is 40% of the basic salary. HRA is Rs. 4500. If Job Id is 2 then DA is 35% of the basic salary. HRA is Rs.3500. If Job Id is 3 then DA is 30% of the basic salary. HRA is Rs. 2500. If Job Id is 4 then DA is 25% of the basic salary and HRA is RS.2500. For all the other Job ids DA is 20% of the basic salary and HRA is Rs. 1500. For all the above Job ids PF to be deducted is 4%. For the job ids between1-4 Rs.100 to be deducted as Professional Tax. Find the netpay. |
| **10** | For the above employee worksheet perform the following operations   * Use filter to display the details of employees whose salary is greater than 10,000. * Sort the employees on the basis of their net pay * Use advance filter to display the details of employees whose designation is "Programmer‖ and Net Pay is greater than 20,000 with experience greater than 2yrs |
| **11** | Using Excel project the Products ales for any five products for five years.   * Compute the total sales of each product in the five years. * Compute the total sales of all the products in five year. * Compute the total sales of all products for each year. * Represent annual sale of all the products using Pie-Chart. * Represent annual sales of all products using Bar Chart. * Represent sale of a product for five years using Pie-Chart. * Label and format the graphs |
| **12** | Create a statement of Telephone Bill Charge for a customer.   * Telephone Calls * Up to150calls- free * 151to500calls-0.80percall * 501 to1000calls-1.00percall * 1001to2000-1.25percall * Above2000- 1.40percall |
| **13** | Perform Following:   * Using Excel write sales data with columns product, month and sales. Write at least 5 records. Create Pivot Table chart and Report for the data. * Create a macro to change the name of worksheet as Macro Example, merge first three columns of first row and write heading as DATA in green color with yellow background * Link word document in excel worksheet to show the usage of linking and embedding. |
| **14** | MS Power Point  Assume that you are going to give a presentation about Information Technology. (Choose some latest technologies). The presentation should have minimum 10 slides. Insert appropriate images wherever necessary. Use proper formatting, Diagrams and tables. Show the usage of action buttons, hyperlinks,  and animations. |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 2 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | 2 | 2 | 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO4** | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO5** | - | 3 | 3 | 1 | 1 | - | - | - | - | - | - | - | - | - | - |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Code: BCACCA1204 Web Technology Lab 1 Credit [LTP: 0-0-2]**

**Course Outcome: -**

Students will be able to:

* + - Apply the principles of creating an effective web page, including an in-depth consideration of information architecture.
    - Become familiar with graphic design principles that relate to web design and learn how to implement theories into practice.
    - Develop skills in analyzing the usability of a web site.
    - Evaluate how to plan and conduct user research related to web usability.
    - Learn the language of the web: HTML and CSS.

1. **LIST OF EXPERIMENTS:**

|  |  |
| --- | --- |
| **1** | **Hello World Web Page**   1. Create a web page using basic HTML features like tags, attributes, elements and page title. 2. How to install and configure a web server |
| **2** | **Create a My Profile Page**   1. Using text boxes, check boxes, radio buttons and submit buttons. 2. Design a web page using CSS include the following:    1. Control the repetition of image with back ground-repeat property.    2. Define style for links asa: link, b:active,c:hover,d:visited.    3. Add customized cursors for links. |
| **3** | **Profile Page Create a My**   1. A more functional web page by making use of headings, paragraphs, lists, images and links. 2. Design a web page using CSS include the following:    1. Use different font styles.    2. Set back ground image for both the page and single elements on the page. |
| **4** | Create XML Http Request and retrieve data from a text file and an XML file. |
| **5** | **Create the following webpage**   1. Show the class time table in a tabular format. 2. Create a web page using HTML to show your geolocation. |
| **6** | Create a webpage using HTML for audio and video player. |
| **7** | Create a log in registration form using PHP. |
| **8** | Develop a PHP web page to manipulating files such as creating ,writing, reading and uploading. |
| **9** | Create a dynamic web page by using PHP conditional operators, loops and strings to create an dynamic time table page. |
| **10** | Develop a PHPweb application track the user as how many times visited and last visited time |
| **11** | Develop a static website–I. |
| **12** | Develop a static website–II. |

**C.RECOMMENDED STUDY MATERIAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Text Books:** | **Author** | **Edition** | **Publication** |
| 1. | Practical Web Design for Absolute Beginners | AdrianW. West | 2016 | Apress 2016 |
| 2. | Introducing Web Development | Jorg Krause | 2017 | Apress2017 |
| 3. | HTML & CSS: The  Complete Reference | Thomas Powell | 2010, FifthEdition | McGrawHill |
| **Reference Book** | | | | |
| 1. | [HTML and CSS: Design and Build Websites – by Jon Duckett](https://www.amazon.com/HTML-CSS-Design-Build-Websites/dp/1118008189/?tag=codeinwp0d3-20) | | | |
| 2. | [Head First HTML and CSS: A Learner‘s Guide to Creating Standards-Based Web Pages – by Elisabeth](https://www.amazon.com/Head-First-HTML-CSS-Standards-Based/dp/0596159900/?tag=codeinwp0d3-20)  [Robson & Eric Freeman](https://www.amazon.com/Head-First-HTML-CSS-Standards-Based/dp/0596159900/?tag=codeinwp0d3-20) Publisher- ORELLY | | | |
| **Online Resources** | | | | |
| 1. | <https://www.w3schools.com/html/html_links.asp> | | | |
| 2. | <https://www.tutorialrepublic.com/html-tutorial/html-links.php> | | | |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 2 | 1 | 1 | - | - | - | - |  |  |  |  |  |  |  |  |
| **CO2** | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | 2 | 3 | 2 | 1 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO4** | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO5** | 2 | - | 2 | 2 | 1 | - | - | - | - | - | - | - | - | - | - |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Minor Courses**

**Theory**

**Code: BCTCCA1101 Fundamentals of Cloud Technology 3 Credit [LTP: 3-0-0]**

**COURSE OUTCOME**

Students will be able to:

* Be familiar with the fundamentals and essentials of Cloud Computing.
* To know a sound foundation of the Cloud computing so that they are able to start using and adopting Cloud Computing services and tools in their real life scenarios.
* To manage the student different platform and Services of Cloud
* Explore some important cloud computing driven commercial systems such as GoogleApps, Microsoft Azure and Amazon Web Services and other businesses cloud applications.
* To able to handle the daily and commercial life use of Cloud and capable to apply in it

1. **OUTLINE OF THE COURSE**

|  |  |  |
| --- | --- | --- |
| **Unit No.** | **Title of The Unit** | **Time required for the Unit (Hours)** |
| **1.** | **Fundamentals of Cloud Computing** | **07** |
| **2.** | **Cloud Models** | **08** |
| **3.** | **Cloud Platforms** | **08** |
| **4.** | **Cloud Computing - Challenges, Risk and**  **Mitigation** | **07** |
| **5.** | **Managing the Cloud** | **07** |

1. **DETAILED SYLLABUS**

|  |  |
| --- | --- |
| **Unit** | **Unit Details** |
| **1.** | **Fundamentals of Cloud Computing** |
|  | * Introduction of Unit * Cloud Computing Basics – History of Cloud Computing, Characteristics of Cloud Computing, Need for Cloud computing, Advantages and Possible Disadvantages of cloud computing , * Cloud Deployment Models- Public, Private, Hybrid Community, Other deployment Models. * Evolving Data Center into Private Cloud, Datacenter Components * Extracting Business value in Cloud Computing – Cloud Security, Cloud Scalability, Distribution over the Internet, * Conclusion of Unit |
| **2.** | **Cloud Models** |
|  | * Introduction of Unit * Introduction to Cloud Services, Infrastructure as a Service (IaaS) – Overview, Virtualization,Container, Pricing Models * Service Level Agreements, Migrating to the Cloud, IaaS Networking options, Virtual Private Cloud(VPC), IaaS Storage – File and Object storage * Data Protection, IaaS security, Benefits, Risks and Examples of IaaS. Platform as a Service (PaaS) – Overview, IaaS vs PaaS, PaaS Examples, benefits and risks. Software as a Service (SaaS) – Introducing SaaS: SaaS Examples – Office 365, Google G Suite, Salesforce.com * Evaluating SaaS – user and vendor perspective, Impact of SaaS, Benefits and risks of SaaS. Other Services on Cloud, Cloud Delivery Models Considerations * Conclusion of Unit |
| **3.** | **Cloud Platforms** |
|  | * Introduction of Unit * Introducing Cloud Platforms, Evaluating cloud platforms, Cloud Platform technologies-Amazon Web Services, Microsoft Azure, Google Cloud Platform, Salesforce.com * Impact of Cloud platforms. Private Cloud Platforms – Introducing Private clouds – Microsoft Azure |
|  | stack, Open stack, AWS Greengrass, Impact of Private clouds   * Cloud Migration : Delivering Business Processes from the Cloud: Business process, examples, Broad Approaches to Migrating into the Cloud, The Seven-Step Model of Migration into a Cloud, * Efficient Steps for migrating to cloud Risks: Measuring and assessment of risks, * Conclusion of Unit |
| **4.** | **Cloud Computing - Challenges, Risk and**  **Mitigation** |
|  | * Introduction of Unit * Cloud Storage, Application performance, Data Integration, Security. Ensuring Successful Cloud Adoption: Designing a Cloud Proof of Concept, Vendor roles and capabilities, moving to the Cloud. Impact of Cloud on IT Service Management. * Risks and Consequences of Cloud Computing – Legal Issues, Compliance Issues, Privacy and Security. * Conclusion of Unit |
| **5.** | **Managing the Cloud** |
|  | * Introduction of Unit * Managing and Securing Cloud Services, Virtualization and the Cloud, Managing Desktops and devices on the cloud, SOA and Cloud computing, Managing the Cloud environment, * Planning for the Cloud – Economic Cost Model and Leveraging the Cloud, Cloud computing resources, Cloud Dos and Don’ts. * Conclusion of Unit |

1. **RECOMMENDED STUDY MATERIAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Text Books:** | **Author** | **Edition** | **Publication** |
| 1. | Cloud computing a practical approach - | Anthony T.Velte , Toby J. Velte Robert  Elsenpeter, | Latest | TMH. |
| 2. | Cloud Computing: Web-Based Applications  That Change the Way You Work and Collaborate Online - | Michael Miller | 2008 | Que 2008 |
| **Reference Book** | | | | |
| 1 | Cloud computing for dummies- Judith Hurwitz , Robin Bloor , Marcia Kaufman ,Fern Halper, Wiley Publishing, Inc, 2010 | | | |
| 2 | Professional Mobile Application Development Jeff McWherter, Scott Pearson Education, 2012 | | | |
| **Online Resources** | | | | |
| 1. | https:/[/www.edx.org/learn/cloud\_computing](http://www.edx.org/learn/cloud_computing) | | | |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | 3 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO4** | 1 | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO5** | 1 | 2 | 3 | - | 2 | - | - | - | - | - | - | - | - | - | - |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Ability Enhancement Courses (AEC)**

**CODE: BULCHU1202 Foundation English 1 Credit [LTP: 0-0-2]**

**COURSE OUTCOMES**

Students would be able to:

CO1: Demonstrate the grammar skills involved in writing sentences and short paragraphs.

CO2: Build up a good command over English grammar and vocabulary to be able to ace error spotting.

CO3: Define unknown words in sentence level context using a picture dictionary or by creating a memory link for support.

CO4: Understand, analyze and effectively use the conventions of the English language.

CO5: Develop their interest in reading and enhance their oral and silent reading skills along with sharpen their critical and analytical thinking

**A. OUTLINE OF THE COURSE**

|  |  |  |
| --- | --- | --- |
| **Unit No.** | **Title of the Unit** | **Time required for the Unit**  **(Hours)** |
| **1** | **Basics of Grammar** | **8** |
| **2** | **Spotting the Grammatical Errors and Rectification** | **2** |
| **3** | **Vocabulary Building** | **4** |
| **4** | **Basics of Writing Skills** | **2** |
| **5** | **Reading Comprehension** | **8** |

**B. LIST OF EXPERIMENTS**

|  |  |
| --- | --- |
| 1 | Parts of Speech: Theory & Practice through various Exercises |
| 2 | Sentence Structures: Theory & Practice through various Exercises |
| 3 | Tenses: Theory & Practice through various Exercises |
| 4 | Spotting the Errors: Applying the rules and Practice Questions |
| 5 | Vocabulary Building-I: Practice by sentence formation |
| 6 | Vocabulary Building-II: Practice by sentence formation |
| 7 | Paragraph Writing |
| 8 | Article Writing |
| 9 | Précis Writing |
| 10 | Formal & Informal Letter Writing |
| 11 | Reading Comprehension- I: Beginner’s level reading and Answering the Questions (Competitive Exams) |
| 12 | Reading Comprehension- II: Intermediate’s level reading and Answering the Questions (Competitive Exams) |

**Skill Enhancement Courses (SEC)**

**CODE: BULCSE1201 Skill Enhancement Generic Course -I 1 Credit [LTP: 0-0-2]**

**COURSE OUTCOMES:**

Students will be able to:

CO.1: Enhance problem solving skills.

CO.2: Prepare for various public and private sector exams & placement drives

CO.3: Communicate effectively & appropriately in real life situation.

CO.4: Improve verbal ability skill among students.

CO.5: Enrich their knowledge and to develop their logical reasoning thinking ability.

|  |  |
| --- | --- |
| **LIST OF ACTIVITIES** | |
| 1 | SMART Goals,Goal Setting (IKIGAI), Wheel of Satisfaction, Exchanging pleasantries |
| 2 | Root Words, Prefix-Suffix, Antonyms, Synonyms & Analogies, Sentence Correction-1 |
| 3 | Numbers,Relations & Functions, HCF & LCM, Average & Divisibility |
| 4 | Resume Tips & Resume Review |
| 5 | How to win friends & Influence people, Sentence Correction-2 |
| 6 | Series & Progressions |
| 7 | Number Series & Letter Series, Crypto-arithmetic, SWOT/SWOC |
| 8 | Percentage, Profit & Loss, Ratio Proportion, CI & SI |
| 9 | Mixtures and Allegations, Short Cut Tricks, Seating Arrangement, Sequencing & Ranking |
| 10 | Surds & Indices, Problem on ages,Solving Equations - Quadratic & Linear |
| 11 | Time & Distance, Boats & Streams, Clocks and Calendars |
| 12 | GD, Practice of GD, Reading and Comprehension |

**Value Added Courses (VAC)**

**CODE: BUVCSA1102 Environment Studies 2 Credit [LTP: 2-0-0]**

**COURSE OUTCOMES:**

**S**tudents would be able to:

CO1: Understand the scope of environmental studies and explain the concept of ecology, ecosystem and biodiversity.

CO2: Implement innovative ideas of controlling different categories of Environmental Pollution. CO3: Explain different environmental issues together with various Environmental Acts, regulations and International Agreements.

CO4: Summarize social issues related to population, resettlement and rehabilitation of project affected persons and demonstrate disaster management with special reference to floods, earthquakes, cyclones ,landslides.

CO5: Determine the local environmental assets with simple ecosystems and identify local flora and fauna.

* 1. **OUTLINE OF THE COURSE**

|  |  |  |
| --- | --- | --- |
| **Unit No.** | **Title of the unit** | **Time required for the Unit (Hours)** |
| **1.** | Introduction to Environmental Studies | **5** |
| **2.** | Environmental Pollution and its Control | **5** |
| **3.** | Environmental Policies & Practices | **5** |
| **4.** | Human Communities and the Environment | **5** |
| **5.** | Field Work | **4** |

* 1. **DETAILED SYLLABUS**

|  |  |
| --- | --- |
| **Unit** | **Unit Details** |
| **1.** | **Introduction to Environmental Studies** |
|  | * Introduction of Unit * Multidisciplinary nature of environmental studies Concept of sustainability and sustainable development. * Ecosystem: Structure and function of ecosystem * Energy flow in an ecosystem: food chains, food webs and ecological succession. Casestudies\ * Case studies of the following ecosystems: Forest ecosystem, Grassland ecosystem, Desertecosystem * Aquatic ecosystems * Biodiversity and Conservation * Conclusion & Real Life Application |
| **2.** | **Environmental Pollution and its Control** |
|  | * Introduction of Unit * Environmental pollution: types, causes, effects and controls; Air, water, soil and noisepollution * Nuclear hazards and human health risks * Solid waste management: Control measures of urban and industrial waste. * Pollution case studies * Conclusion & Real Life Application |
| **3.** | **Environmental Policies & Practices** |

|  |  |
| --- | --- |
|  | * Introduction of Unit * Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture * Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies. * Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. * International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD) * Conclusion & Real Life Application |
| **4.** | **Human Communities and the Environment** |
|  | * Introduction of Unit * Human population growth: Impacts on environment, human health and welfare. * Resettlement and rehabilitation of project affected persons; case studies. * Disaster management: floods, earthquake, cyclones and landslides. * Conclusion & Real Life Application |
| **5.** | **Field Work** |
|  | * Introduction of Unit * Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc. * Visit to a local polluted site-Urban/Rural/Industrial/Agricultural. * Study of common plants, insects, birds and basic principles of identification. * Study of simple ecosystems-pond, river, Delhi Ridge, etc. * Conclusion & Real Life Application |

**C.RECOMMENDED STUDY MATERIAL:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Reference Book** | **Author** | **Edition** | **Publication** |
| 1 | Environmental Studies | Erach Barucha | Latest | UGC |
| 2 | Environmental Studies | Benny Joseph | Latest | Tata Mcgraw Hill |
| 3 | Environmental Studies | R. Rajagopalan | Latest | Oxford University Press |
| 4 | Principles of Environmental  Science and Engineering | P. Venugoplan Rao | Latest | Prentice Hall of India. |
| 5 | Environmental Science and Engineering | Meenakshi | Latest | Prentice Hall India. |

**Semester-II**

**Code: BCACSA2101 Basic Mathematics 3Credits [LTP: 3-0-0]**

**COURSE OUTCOME**

Students will be able to:

* + - To analyze and prove relationships between matrices, rank of matrix and systems of equations, Inverses.
    - Analyze the correlation and regression with their properties
    - Determine the basic concepts of matrix Algebra
    - Analyze the equal and unequal intervals for Interpolation problem
    - Analyze the numerical methods to solve differential equations

1. **OUTLINE OF THE COURSE**

|  |  |  |
| --- | --- | --- |
| **Unit No.** | **Title of The Unit** | **Time required for the Unit (Hours)** |
| **1.** | **Data representation and Analysis** | **08** |
| **2.** | **Regression and Correlation** | **08** |
| **3.** | **Matrices** | **08** |
| **4.** | **Interpolation Methods** | **08** |
| **5.** | **Numerical integration and differentiation** | **08** |

1. **DETAILED SYLLABUS**

|  |  |
| --- | --- |
| **Unit** | **Unit Details** |
| **1.** | **Data representation and Analysis** |
|  | * Introduction of Unit * Statistical diagram: scattered diagram, histogram, ogiecurve, pilchard * Measure of Central Tendency, Mean, Median, Mode. * Measure of Dispersion : Range, Quartile Deviation * Standard Deviation * Conclusion & Real Life Application |
| **2.** | **Regression and Correlation** |
|  | * Introduction of Unit * Measure of association between two variables Types of correlation , Karl Pearson‘s Coefficient of correlation * Spearman‘s Rank correlation and its interpretations * Regression Analysis: Concept and difference between correlation and regression, linear regression equations, * Properties of regression coefficients * Conclusion & Real Life Application |
| **3.** | **Matrices** |
|  | * Introduction of Unit * Definition of Matrix * Types of Matrices * Arithmetic operations of Matrices (Addition, Scalar Multiplication, Matrix Multiplication) * Determinants * Computation of Inverse * Conclusion of Unit |
| **4.** | **Interpolation Methods** |
|  | * Introduction of Unit * Finite difference, Forward and backward differences, Interpolation and Extrapolation, * Newton‘s forward interpolation formula, Newton‘s back ward interpolation formula, * Lagrange‘s interpolation formula * Newton‘s divided difference formula * Conclusion & Real Life Application |
| **5.** | **Numerical Integration and differentiation** |
|  | * Introduction of Unit * Numerical integration, Gaussian integration Trapezoidal Method, Simpson‘s rule (1/3,3/8), * Numerical differentiation Euler‘s method, Modified Euler‘s method, Runge Kutta 4th order method,. * Conclusion & Real Life Application |

1. **RECOMMENDED STUDY MATERIAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.No** | **Text Books:** | **Author** | **Edition** | **Publication** |
| 1. | Business Mathematics | V.K. Kapoor | Latest | S. Chand and Sons Publications |
| 2. | Introductory Methods of Numerical  Analysis | S.S. Sastry | Latest | Prentice Hall of India |
| 3. | Computer Oriented Numerical Methods | V. Rajaraman | Latest | Prentice Hall of India |
| **Reference Book** | | | | |
| 1. | HigherEngineeringMathematics,GrewalB.S.andGrewalJ.S,KhannaPublishers,NewDelhi, Latest Edition | | | |
| 2. | A textbook of Computer based numerical and Statistical Techniques: A.K. Jaiswal & Anju Khandelwal,  New Age International Publishers | | | |
| **OnlineResources** | | | | |
| 1. | https://[www.udemy.com/course/computer-oriented-numerical-techniques/](http://www.udemy.com/course/computer-oriented-numerical-techniques/) | | | |
| 2. | <https://onlinecourses.swayam2.ac.in/cec22_ma02/preview> | | | |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 2 |  | 3 |  | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **CO2** |  | 3 | 2 | 1 | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **CO3** |  | 3 | 1 | 1 | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **CO4** |  | 3 | 1 | 1 | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **CO5** |  | 3 | 1 | 1 | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Code: BCACCA2102 Computer Networks 3 Credits [LTP: 3-0-0]**

**COURSE OUTCOME**

Students will be able to:

* + Gain the knowledge of the basic computer network technology and become familiar with layered communication architectures (OSI and TCP/IP).
  + Acquire basics of Framing and Error detection including parity, checksums, and CRC.
  + Gain the knowledge of the basic IP configuration used for Networking. Also clear the concept of Logical and Physical Addressing
  + Know the concepts of reliable data transfer and how TCP implements these concepts.
  + Learn the principles of WAN routing and the semantics.

1. **OUTLINE OF THE COURSE**

|  |  |  |
| --- | --- | --- |
| **Unit No.** | **Title of The Unit** | **Time required for the Unit (Hours)** |
| **1.** | **Networking Fundamentals & Internet** | **09** |
| **2.** | **Basics Presentation &Application Layer** | **07** |
| **3.** | **Basics of Transport layer &Network, Layer** | **08** |
| **4.** | **Basics of Data Link Layer** | **07** |
| **5.** | **Basics of WAN Technology** | **07** |

1. **DETAILED SYLLABUS**

|  |  |
| --- | --- |
| **Unit** | **Unit Details** |
| **1.** | **Networking Fundamentals & Internet** |
|  | * Basics of Network & Networking, Types of Networks: LAN, MAN, WAN, Peer-to-Peer & Client/Server, Workgroup V/S. Domain, Network Topologies. The Internet, Network Devices- NIC, Hub, Switch, Bridge, Router, Gateways, Firewall, Repeater, CSU/DSU, and modem, Introduction of OSI model, and TCP/IP Model, Comparison between OSI model & TCP/IP model. Physical Layer: Types of Transmission Media, Communication Modes, Wiring Standards and Cabling- straight through cable, crossover cable, rollover cable, Media connectors (Fiber optic, Coaxial, and TP etc.) Switching Methods (Circuit/Packet Switching) Uni-cast, Multicast, Broadcast * Conclusion &Real Life Application |
| **2.** | **Basics Presentation &Application Layer** |
|  | * Presentation Layer protocols:-TLS, SSL, MIME * Application Layer: Functions and support, Application Layer Protocols: DHCP, DNS, HTTP/HTTPS, FTP, TFTP, SFTP, Telnet, Email: SMTP, POP3/IMAP, NTP. * Conclusion &Real Life Application |
| **3.** | **Basics of Transport layer &Network, Layer** |
|  | * Transport Layer: Transmission Control Protocol(TCP), User Datagram Protocol (UDP), Overview of Ports & Sockets * Network Layer: Internet Protocol (IP), IP standards, versions, functions, The IPv4 Datagram Format, IPv4 addressing, IPv4 address Classes, IPv4 address types, Default Gateway, Public & Private IP Address, methods of assigning IP address, Subnet Mask and sub-neting, IPv6 address, types, assignment, Data encapsulation, Introduction to Routing and Switching concepts. * Conclusion &Real Life Application |
| **4.** | **Basics of Data Link Layer** |
|  | * Application of Data Link Layer: Framing and Error detection and correction. Stop and Wait protocol, Sliding Window protocols Go-Back-N Protocol, Channel allocation problem, Multiple access protocols: ALOHA, Carrier sense multiple access protocols. Wireless Networking, Types of Wireless Networks: Ad-hoc mode, Infrastructure mode, wireless LAN standards: IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, wireless security Protocols: WEP,WPA, 802.1X. * Conclusion &Real Life Application |
| **5.** | **Basics of WAN Technology** |
|  | * What Is a WAN?, WAN Switching, WAN Switching techniques Circuit Switching, Packet Switching etc., Connecting to the Internet : PSTN, ISDN, DSL, CATV, Satellite-Based Services, Last Mile Fibre, Cellular Technologies * Connecting LANs: Leased Lines, SONET/SDH, Packet Switching, Remote Access: Dial-up Remote Access, Virtual LAN, Virtual Private Networking * Conclusion &Real Life Application |

1. **RECOMMENDED STUDY MATERIAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Text Books:** | **Author** | **Edition** | **Publication** |
| **1.** | Computer Network | AndrewS. Tanenbaum | 2013 | Pearson |
| **2.** | Computer Networking: Top Down Approach | Kurose. Ross | 2017 | Pearson |
| **Reference Book** | | | | |
| 1. | [Networking All in One –](https://www.amazon.com/HTML-CSS-Design-Build-Websites/dp/1118008189/?tag=codeinwp0d3-20) Doug Lowe 7thedition Publisher- Wiley | | | |
| **Online Resources** | | | | |
| 1. | <https://www.edx.org/learn/computer-networking> | | | |
| 2. | https://[www.youtube.com/watch?v=VwN91x5i25g](http://www.youtube.com/watch?v=VwN91x5i25g) | | | |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - |
| **CO2** | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO4** | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO5** | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - | - |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Code:BCACCA2103 Python Programming 3 Credits [LTP: 3-0-0]**

**COURSE OUTCOME**

Students will be able to:

* + Acquire the basic terminology used in computer programming to write, compile and debug programs in Python programming language.
  + Use different data types to design programs involving decisions, loops, and functions for problem solving
  + Apply various object oriented programming
  + Handle the exceptions which are raised during the execution of Python scripts
  + Implement files and classes in the Python programming environment

1. **OUTLINE OF THE COURSE**

|  |  |  |
| --- | --- | --- |
| **Unit No.** | **Title of The Unit** | **Time required for the Unit (Hours)** |
| **1** | **Introduction to Python Programming** | **07** |
| **2** | **Python Operators and Control Flow statements** | **09** |
| **3** | **Data Structures, Python Functions and Packages** | **09** |
| **4** | **Object Oriented Programming** | **08** |
| **5** | **File I/O Handling and Exception Handling** | **09** |

1. **DETAILED SYLLABUS**

|  |  |
| --- | --- |
| **Unit** | **Unit Details** |
| **1.** | **Introduction to Python Programming** |
|  | * Introduction to Unit * What is Python, * Uses of Python Programming Language / Python Applications * Features of Python Programming Language * Python-2 and Python-3 differences * Python environment setup — Installation and working of IDE * Running Simple Python scripts to display 'welcome' message. * Python Data Types: Numbers, String, Tuples, Lists, Dictionary. Declaration and use of data types * Python building blocks — Identifiers, Keywords, Indention, Variables, Comments * Conclusion of unit |
| **2.** | **Python Operators and Control Flow statements** |
|  | * Introduction to Unit * Basic Operators: Arithmetic, Comparison/ Relational, Assignment, Logical, Bitwise, Membership, Identity operators, Python Operator Precedence * Control Flow: * Conditional Statements (if, if ... else, nested if) * Looping in python (while loop, for loop, nested loops) * loop manipulation using continue, pass, break, else. * .Conclusion of Unit |
| **3.** | **Data Structures, Python Functions and Packages** |
|  | * Introduction to Unit * Lists, Tuple, Sets, Dictionaries * String and Slicing * Use of Python builtUser defined functions and its types * Command-line Arguments * Python Packages: Introduction, Writing Python packages * Using standard packages (e.g. math, scipy, Numpy, matplotlib, pandas etc.) * user defined packages * Conclusion of Unit |
| **4.** | **Object Oriented Programming** |
|  | * Introduction of Unit * Creating Classes and Objects * Inheritance * Method Overloading and Overriding * Data Hiding * Data abstraction, Abstract classes * Types of Methods : Instance Methods , Static Methods , Class Methods * Accessing attributes , Built-In Class Attributes * Destroying Objects * Conclusion of Unit |
| **5.** | **File I/O Handling and Exception Handling** |
|  | * Introduction of Unit * Types of File * File Objects, File Built-in Function, File Built-in Methods * File Built-in Attributes * Read/write operations Reading Text * Moving cursor in file inbuilt -functions * Errors in Python : Compile-Time Errors ,Runtime Errors , Logical Errors * What is Exception? * try….except…else, try-finally clause * Regular expressions * Conclusion of Unit |

1. **RECOMMENDED STUDY MATERIAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Text Books:** | **Author** | **Edition** | **Publication** |
| 1. | Core Python Programming | Chun, JWesley | 2007 | Pear son, |
| 2. | Head First Python | Barry,Paul | 2010 | ORielly, |
| **Reference Book** | | | | |
| 1 | Learning Python Lutz, Mark O Rielly, 2009 | | | |
| **Online Resources** | | | | |
| 1 | https://[www.learnpython.org/](http://www.learnpython.org/) | | | |
| 2 | https://realpython.com/start-here/ | | | |
| 3 | https://[www.programiz.com/python-programming](http://www.programiz.com/python-programming) | | | |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - |
| **CO2** | 2 | 3 | 2 | 2 | 3 | - | - | - | - | - | - | - | - | - | - |
| **CO3** |  | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO4** | - | - |  | 3 |  | - | - | - | - | - | - | - | - | - | - |
| **CO5** | - | 1 | 3 | - | 2 | - | - | - | - | - | - | - | - | - | - |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Code:BCACCA2104 Linux and Shell Script 3 Credits [LTP: 3-0-0]**

**COURSE OUTCOME**

Students will be able to:

* Use various Linux commands that are used to manipulate system operations at admin level and a prerequisite to pursue job as a Network administrator.
* Write Shell Programming using Linux commands.
* Design and write application to manipulate internal kernel level Linux File System.
* Develop IPC-API‘s that can be used to control various processes for synchronization.
* Develop Network Programming that allows applications to make efficient use of resources available on different machines in a network.

1. **OUTLINE OF THE COURSE**

|  |  |  |
| --- | --- | --- |
| **Unit No.** | **Title of The Unit** | **Time required for the Unit (Hours)** |
| **1.** | **Introduction to Linux and Linux utilities** | **07** |
| **2.** | **Introduction to shells** | **08** |
| **3.** | **Unix file structure** | **08** |
| **4.** | **Process and signals** | **07** |
| **5.** | **Inter process communication** | **07** |

1. **DETAILED SYLLABUS**

|  |  |
| --- | --- |
| **Unit** | **Unit Details** |
| **1.** | **Introduction to Linux and Linux utilities** |
|  | * Introduction of Unit * INTRODUCTION TO LINUX AND LINUX UTILITIES: A brief history of LINUX, architecture of LINUX, * features of LINUX, introduction to vi editor. * Linux commands- PATH, man, echo, printf, script, passwd, uname, who, date, stty, pwd, cd, mkdir, * rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip, file handling utilities, security by file permissions, * process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask, * ulimit, ps, w, finger, arp, ftp, telnet, rlogin.Text Processing utilities and backup utilities , tail, head , * sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, cpio * Conclusion of Unit |
| **2.** | **Introduction to shells** |
|  | * Introduction of Unit * Introduction to Shells: Linux Session, Standard Streams, Redirection, Pipes, Tee Command, * Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, * Variables, Predefined Variables, Options, Shell/Environment Customization. * Filters: Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, * Sorting, Translating Characters, Files with Duplicate Lines, Count Characters, Words or Lines, * Comparing Files. * Conclusion of Unit |
| **3.** | **Unix file structure** |
|  | * Introduction of Unit * Grep: Operation, grep Family, Searching for File Content. * Sed :Scripts, Operation, Addresses, commands, Applications, grep and sed. * UNIX FILE STRUCTURE: Introduction to UNIX file system, inode (Index Node), file descriptors, * system calls and device drivers. * Conclusion of Unit |
| **4.** | **Process and signals** |

|  |  |
| --- | --- |
|  | * Introduction of Unit * PROCESS AND SIGNALS: Process, process identifiers, process structure: process table, viewing * processes, system processes, process scheduling, starting new processes: waiting for a process, * zombie processes, orphan process, fork, vfork, exit, wait, waitpid, exec, signals functions, unreliable * signals, interrupted system calls, kill, raise, alarm, pause, abort, system, sleep functions, signal sets. * File locking: creating lock files, locking regions, use of read and write with locking, competing locks,other lock commands, deadlocks. * Conclusion of Unit |
| **5.** | **Inter process communication** |
|  | * Introduction of Unit * INTER PROCESS COMMUNICATION: Pipe, process pipes, the pipe call, parent and child * processes, and named pipes: fifos, semaphores: semget, semop, semctl, message queues: msgget, * msgsnd, msgrcv, msgctl, shared memory: shmget, shmat, shmdt, shmctl, ipc status commands. * INTRODUCTION TO SOCKETS: Socket, socket connections - socket attributes, socket addresses, * socket, connect, bind, listen, accept, socket communications. * Awk and perl Programming: Awk pattern scanning and processing language, BEGIN and END patterns, Awk arithmetic and variables, Awk built in variable names and operators, arrays, strings, * functions, perl; the chop() function, variable and operators, $\_ and $. , Lists, arrays, regular expression and substitution, file handling, subroutines, formatted printing. * Conclusion of Unit |

1. **RECOMMENDED STUDY MATERIAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Text Books:** | **Author** | **Edition** | **Publication** |
| 1. | *Advanced Programming in the UNIX*  *Environment* | *W. Richard. Stevens* | 3rd  edition | Pearson Education |
| 2. | Unix and shell Programming | [*Stephen Kochan,*](https://www.amazon.in/s/ref%3Ddp_byline_sr_book_1?ie=UTF8&field-author=Stephen%2BKochan&search-alias=stripbooks) [*Patrick*](https://www.amazon.in/s/ref%3Ddp_byline_sr_book_2?ie=UTF8&field-author=Patrick%2BWood&search-alias=stripbooks)  [*Wood*](https://www.amazon.in/s/ref%3Ddp_byline_sr_book_2?ie=UTF8&field-author=Patrick%2BWood&search-alias=stripbooks) | Latest | Sams |
| **Reference Book** | | | | |
| 1. | Linux System Programming, *Robert Love, O’Reilly*, SPD. | | | |
| 2. | Advanced Programming in the UNIX environment, 2nd Edition, *W.R.Stevens*, Pearson Education. | | | |
| 3. | UNIX Network Programming, *W.R. Stevens*, PHI.  UNIX for Programmers and Users, 3rd Edition, *Graham Glass, King Ables*, Pearson Education | | | |
| **Online Resources** | | | | |
| 1. | https://[www.tutorialspoint.com/unix/shell\_scripting.htm](http://www.tutorialspoint.com/unix/shell_scripting.htm) | | | |
| 2. | https://[www.javatpoint.com/shell-scripting-tutorial](http://www.javatpoint.com/shell-scripting-tutorial) | | | |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - |
| **CO2** | - | 3 | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | 3 | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO4** | - | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | - |
| **CO5** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Code: BCACCA2105 Software Engineering 3 Credits [LTP: 3-0-0]**

**COURSE OUTCOME**

Students will be able to:

* Gather and specify requirements of the software projects.
* Analyze software requirements with existing tools.
* Differentiate different testing methodologies.
* Apply the basic project management practices in real life projects.
* Work in a team as well as independently on software projects

1. **OUTLINE OF THE COURSE**

|  |  |  |
| --- | --- | --- |
| **Unit No.** | **Title of The Unit** | **Time required for the Unit (Hours)** |
| **1** | **Software Process Models** | **8** |
| **2** | **Software Design** | **8** |
| **3** | **Introduction to Software Testing** | **10** |
| **4** | **Software Quality Management** | **8** |
| **5** | **Software Project Management** | **8** |

1. **DETAILED SYLLABUS**

|  |  |
| --- | --- |
| **Unit** | **Unit Details** |
| **1.** | **Software Process Models** |
|  | * Introduction to Unit * How to develop software? * Different models - Water fall model – Prototyping – evolutionary model- Spiral model– RAD model - Agile models: Extreme Programming, and Scrum-pros and cons of each model * Requirements Analysis-Functional and Non-functional requirements, * Software Requirement Specification(SRS)–Decision tables–DecisionTrees * Conclusion of the Unit |
| **2.** | **Software Design** |
|  | * Introduction to Unit * Overview of design process: High-level and detailed design * Cohesion and Coupling Design Methodologies * Function–Oriented software design: Structured Analysis using DFD Structured Design using Structure * Architectural Design, Interface design, Component Leve ldesign * Software Reuse and Software Maintenance issues * Conclusion of the Unit |
| **3.** | **Introduction to Software Testing** |
|  | * Coding, Code Review, documentation. * Testing: - Unit testing, Black-box Testing, White-box testing, * Cyclomatic complexity measure, coverage analysis, mutation testing, * Debugging techniques, Integration testing, System testing, * Regression testing. * Conclusion of the Unit |
| **4.** | **Software Quality Management** |
|  | * Introduction to Unit * Overview of SQA Planning * Software configuration management |

|  |  |
| --- | --- |
|  | * Study of ISO9000 &CMM * Software reverse engineering * Software reengineering * Conclusion of the Unit |
| **5.** | **Software Project Management** |
|  | * Introduction to Unit * Various phases of Project Management –Planning– Organizing– Staffing– Directing and Controlling, Metrics for project size estimation * Software Project Cost Estimation–COCOMO models * Software Project Scheduling * CASEtools:CASEdefinitions–CASEClassifications–AnalysisandDesignWorkbenches,Testing Workbenches * Conclusion of the Unit |

1. **RECOMMENDED STUDY MATERIAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Text Books:** | **Author** | **Edition** | **Publication** |
| 1. | Fundamentals of Software Engineering, | RajibMall | PHI | 2018 |
| 2. | Software Engineering | I.Sommerville | Pearson Education | Asia |
| **Reference Book** | | | | |
| 1 | Software engineering, Roger SPressman | | | |
| 2 | An Integrated Approach to Software Engineering, Pankaj Jalote | | | |
| **Online Resources** | | | | |
| 1 | https://[www.javatpoint.com/software-engineering-tutorial](http://www.javatpoint.com/software-engineering-tutorial) | | | |
| 2 | https://[www.geeksforgeeks.org/software-engineering/](http://www.geeksforgeeks.org/software-engineering/) | | | |
| 3 | https://[www.tutorialandexample.com/software-engineering-tutorial](http://www.tutorialandexample.com/software-engineering-tutorial) | | | |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - |
| **CO2** | - | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - |
| **CO4** | - | 3 | 2 | 3 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO5** | - | 2 | - | 2 | - | - | - | - | 3 | - | 3 | 1 |  | - | - |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Practical**

**Code:BCACCA2201 Computer Network Lab 1 Credit [LTP: 0-0-2]**

**COURSE OUTCOME**

Students will be able to:

* + Use the clamping tool for making Cross and Straight cable and identify network IP
  + Create local area network and do file sharing activity
  + Configure switch and routers
  + Configure WEP and Ethernet.
  + Recognize static and dynamic routing

1. **List of Programs:**

|  |  |
| --- | --- |
| **1** | Study of different types of Network cables and Practically implement the cross-wired cable and straight through cable using clamping tool |
| **2** | Study/Demonstration of Network Devices and network IP in Detail. |
| **3** | Troubleshooting Scenarios Network -I (Basic network command and Network configuration commands. |
| **4** | Connect the computers with file sharing in Local Area Network. |
| **5** | Creating LAN using different topology using Cisco Packet Tracer |
| **6** | Configure DHCP Server using Cisco PacketTracer |
| **7** | Performing an Initial Switch Configuration. |
| **8** | Performing an Initial Router Configuration |
| **9** | Configuring WEP on a Wireless Router |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - |
| **CO2** | - | - | - | 2 | 2 | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | - | - | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO4** | - | - | 2 | 1 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO5** | - | - | 2 | 2 | - | - | - | - | - | - | - | - | - | - | 2 |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Code:BCACCA2202 Python Programming Lab 1 Credit [LTP: 0-0-2]**

**COURSE OUTCOME**

Students will be able to:

* Write Python code, develop medium-difficulty applications in Python
* Implement Python programs with conditionals and loops
* Apply the concept of List and Dictionary.
* Implement Read and write data from/to files in Python
* Develop Python programs step-wise by defining functions

1. **LIST OF EXPERIMENTS:**

|  |  |
| --- | --- |
| **1** | Write a python program to compute the GCD and LCM of two numbers. |
| **2** | Write python program to perform following operations on Lists:   1. Create list 2. Access list 3. Update list (Add item, Remove item) 4. Delete list |
| **3** | Write a Python program to remove the ―i‖ th occurrence of the given word in a list where words  Repeat |
| **4** | Write a Python program to count the frequency of words appearing in a string using a dictionary. |
| **5** | Write Python program to create a dictionary with key as first character and value as words starting  With that character. |
| **6** | Write a Python program to check if a substring is present in a given string. |
| **7** | Write a Python program to find the intersection and union of two lists. |
| **8** | Write a Python program to find the length of a list using recursion. |
| **9** | Writer a Python program to read a file and capitalize the first letter of every word in the file. |
| **10** | Write a Python program to read the contents of a file in reverse order |
| **11** | Write a python program to create a package (Engg), sub -package( years),modules (sem) and create  staff and student function to module |
| **12** | Write a python program to read 3 subject marks and display pass or failed using class and object |

1. **RECOMMENDED STUDY MATERIAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Text Books:** | **Author** | **Edition** | **Publication** |
| 1 | Core Python Programming | Chun, JWesley | 2007 | Pearson, |
| 2 | Head First Python | Barry,Paul | 2010 | ORielly, |
| **Reference Book** | | | | |
| 1 | Learning Python Lutz, Mark, O Rielly, 2009 | | | |
| **Online Resources** | | | | |
| 1 | https://[www.learnpython.org/](http://www.learnpython.org/) | | | |
| 2 | https://realpython.com/start-here/ | | | |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | - | 2 | 2 | - | - | - | - | - | - | - | - | - | - | - |
| **CO4** | - | - | 2 | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO5** | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | 2 |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Code:BCACCA2203 Linux and Shell Script Lab 1 Credit [LTP: 0-0-2]**

**COURSE OUTCOME**

Students will be able to:

* + Use shell script to create files and handle text documents
  + Create child processes, background process and zombies
  + Familiarize basic concepts of shell programming
  + Demonstrate use of system calls
  + Demonstrate Inter process communication

1. **LIST OF EXPERIMENTS:**

|  |  |
| --- | --- |
| 1 | Study and Practice on various commands like man, passwd, tty, script, clear, date, cal, cp, mv,ln, rm,  unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who, w. |
| 2 | Study and Practice on various commands like cat, tail, head , sort, nl, uniq, grep, egrep,fgrep,cut, paste,  join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio. |
| 3 | 1. Write a Shell Program to print all .txt files and .c files. 2. Write a Shell program to move a set of files to a specified directory. |
| 4 | 1. Write a Shell program to display all the users who are currently logged in after a specified time. 2. Write a Shell Program to wish the user based on the login time. |
| 5 | a) Simulate cat command. b) Simulate cpcommand. |
| 6 | a) Simulate head command. b) Simulate tail command. |
| 7 | a) Simulate mv command. b) Simulate nlcommand. |
| 8 | Write a program to handle the signals like SIGINT, SIGQUIT, SIGFPE. |
| 9 | Implement the following IPC forms  a) FIFO b) PIPE |
| 10 | Implement message queue form of IPC. |
| 11 | Implement shared memory form of IPC. |
| 12 | Write a Socket program to print system date and time (Using TCP/IP). |

1. **RECOMMENDED STUDY MATERIAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No** | **Text Books:** | **Author** | **Edition** | **Publication** |
| 1. | UNIX Shell Scripting | Randal Michael | 2003 | Wiley |
| 2. | Bash Cookbook | Carl Albing, JP  Vossen | 2017 | O‘Reilly |
| 3. | Linux Command Line and Shell Scripting Bible | [Richard](https://www.amazon.in/Richard-Blum/e/B004MPC65G/ref%3Ddp_byline_cont_book_1) [Blum](https://www.amazon.in/Richard-Blum/e/B004MPC65G/ref%3Ddp_byline_cont_book_1) , [ChristineBresnahan](https://www.amazon.in/Christine-Bresnahan/e/B00EKM0XVK/ref%3Ddp_byline_cont_book_2) | 2015 | Wiley |
| **Reference Book** | | | | |
| 1. | Linux Command Line and Shell Scripting Bible 4th Edition by Richard Blum | | | |
| **Online Resources** | | | | |
| 1. | https://[www.tutorialspoint.com/unix/shell\_scripting.htm](http://www.tutorialspoint.com/unix/shell_scripting.htm) | | | |
| 2. | https://[www.javatpoint.com/shell-scripting-tutorial](http://www.javatpoint.com/shell-scripting-tutorial) | | | |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | - | 3 | 2 |  | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | 2 | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - |
| **CO4** | - | - | 2 | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO5** | - | - | 2 | 1 | - | - | - | - | - | - | - | - | - | - | - |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Code:BCACCA2204 Software Engineering Lab 1 Credit [LTP: 0-0-2]**

1. **List of programs**

|  |  |
| --- | --- |
| **Part - A** |  |
|  | Below list of experiments focuses on Project Development and Project Management Skill. It gives you complete understanding of scratch to end scenario of any project.  **Experiment 1:**  Library Management System: The library management system is software, which automates the job of a librarian.  **Task-1**: The user can inquire about the availability of a book in which he can search by entering the author’s name or by entering the title of the book.  **Task -2**: The user can borrow a book. He / She must provide the username and the card number, which is unique and confidential to each user. By confirming the authenticity of a user, the library management system provides information about the number of books already borrowed by the user and by referring to the database whether the user can borrow books or not. The library management system allows the user to enter the title and the author of the book and hence issues the book if it is available.  **Task-3**: By entering the user details and the book details the user can return the borrowed book.  **Experiment 2:**  To develop an AUTOMATED BANKING SYSTEM, which is required to perform the following functions:  **Task-1:** The customer logs into the system using card number and pin number. The system checks for validation.  **Task-2:** The system queries the customer for the type of account either fixed deposit or credit account. After getting the type of account the system shows the balance left.  **Task-3:** The system queries the customer for the transaction type either withdrawal or deposit and the required amount. The user enters the amount and the transaction if carries out.  **Experiment 3:**  AIRLINE RESERVATION SYSTEM: Ticket reservation system for airlines has to be developed. The system developed should contain the following features:  **Task-1:** Search for information about the flight by means of flight number and destination  **Task-2:** While displaying information about the flight it has to provide availability of seats.  **Task-3:** While reserving tickets the system obtain following information from the user Passenger Name, Sex, Age, Address. Credit Card Number, Bank Name. Flight number, Flight name, Date of Journey and number of tickets to be booked.  **Task-4:** Based on the availability of tickets, the ticket has to be issued. The ticket issued should contain the following information –ticket number, flight no, flight name, date of journey, number of passengers, sex, age and departure time.  **Task-5:** Cancellation of booked tickets should be available. |
| **Part - B** | **Experiment 4:**  EMPLOYEE MANAGEMENT APPLICATION: A payroll application is to be developed which is  required to perform the following functions: |
|  | **Task-1:** It must provide a user in employee mode with the details of an employee, which includes his name, department, date of joining and salary.  **Task-2:** It must validate an user to enter in administrator mode using password. It must provide a user to enter in administrator mode to view or modify an employee’s details using his employee ID. It must also allow the user to add a new employee and delete records of an existing employee.  **Experiment 5:**  HOSPITAL MANAGEMENT APPLICATION: A hospital application is to be developed which is required to perform the following functions:  **Task-1:** It must provide a user in admin mode with the details of a patient, doctor.  **Task-2:** It must provide a user in doctor mode who can modify the details of the illness and the treatment. |

**MAPPING OF CO VS PO/PSO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | - | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | 2 | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - |
| **CO4** | - | - | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO5** | - | - | 2 | 2 | - | - | - | - | - | - | - | - | - | - | - |

Note: On the basis of mapping of COs with POs, this course is related to Employability/Skill Development

**Ability Enhancement Courses (AEC)**

**Code:BULCHU2204 LANGUAGE LAB 1 Credit [LTP:0-0-2]**

**COURSE OUTCOMES:**

The students would be able to

CO 1: Identify common errors in spoken and written communication.

CO 2: Get familiarized with English vocabulary and language proficiency.

CO 3: Improve nature and style of sensible writing, acquire employment and workplace communication skills.

CO 4: Improve their Technical Communication Skills through Technical Reading and Writing practices.

CO 5: Perform well in campus recruitment, engineering and all other general competitive examinations.

1. **OUTLINE OF THE COURSE**

|  |  |  |
| --- | --- | --- |
| **Unit No.** | **Title of the unit** | **Time required for the Unit (Hours)** |
| **1.** | **Everyday Conversations** | **8** |
| **2.** | **Asking for** | **7** |
| **3.** | **Reporting/ Describing** | **7** |
| **4.** | **Meeting People** | **7** |
| **5.** | **Expressing & Talking about** | **7** |

1. **DETAILED SYLLABUS**

|  |  |
| --- | --- |
| **Unit** | **Unit Details** |
| **1.** | **Everyday Conversations** |
|  | * Introduction to the Unit * Introducing self / others * Weather * Classroom * Asking about facilities around * Describing a person / thing * Points to cover: Vocabulary, grammar, Construction of sentences, listening * Methodology: Role plays, Videos, Classroom conversation, worksheets * Conclusion & Real Life Application |
| **2.** | **Asking for** |
|  | * Introduction to the Unit * Help/ Suggestion/ ideas * Clarification/ Directions * Time/ food * Advice * Uses * Points to cover: Vocabulary, grammar, Construction of sentences, listening * Methodology: Role plays, Videos, Classroom conversation, worksheets * Conclusion & Real-Life Application |
| **3.** | **Reporting/ Describing** |
|  | * Introduction to the Unit * Incidences * Personalities * Experiences * Wants/Needs * Intentions * Points to cover: Vocabulary, grammar, Construction of sentences, listening * Methodology: Role plays, Videos, Classroom conversation, worksheets * Conclusion& Real-Life Application |
| **4.** | **Meeting People** |
|  | * Introduction to the Unit * Greetings * Starting the Conversation * Small talks * Closing the conversation * Points to cover: Vocabulary, Grammar, Construction of sentences, listening * Methodology: Role plays, Videos, Classroom conversation, worksheet * Conclusion& Real-Life Application |
| **5.** | **Expressing & Talking about** |
|  | * Introduction to the Unit * Happiness/Displeasure * Preferences * Doubts * Views * Unawareness * Points to cover: Vocabulary, grammar, Construction of sentences, listening * Methodology: Role plays, Videos, Classroom conversation, worksheetsInterests * Different Cultures, Clothes, cars, institutes, situations * Schedules, prices * Points to cover: Vocabulary, grammar, Construction of sentences, listeningMethodology: Role plays, Videos, Classroom conversation, worksheets * Conclusion& Real-Life Application |

**RECOMMENDED STUDY MATERIAL:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No** | **Reference Book** | **Author** | **Publication** |
| 1. | Speak Now Level I & II | Jack C Richards &  David Bohlke | Oxford Press |
| 2. | Business Benchmark, Level – | Guy Brook-Hart | Upper Intermediate by Cambridge  University Press |
| 3. | Practical English Usage | Michel Swan | Oxford University Press |
| 4. | Cambridge Grammar for English: A comprehensive Guide for spoken &  written English | Ronald Carter, Michael McCarthy | (South Asian edition), Cambridge University Press |

**Skill Enhancement Courses (SEC)**

**Code:BULCSE2201 Skill Enhancement Generic Course -II 1 Credit [LTP: 0-0-2]**

**COURSEOUTCOMES:**

Students will be able to:

CO.1: Enhance problem solving skills.

CO.2: Prepare for various public and private sector exams & placement drives

CO.3: Communicate effectively & appropriately in real life situation.

CO.4: Improve verbal ability skill among students.

CO.5: Enrich their knowledge and to develop their logical reasoning thinking ability.

|  |  |
| --- | --- |
| **LIST OF LABS** | |
| 1 | Types of Interviews, Interview Practice |
| 2 | Time & Work, Syllogisms |
| 3 | Critical Reasoning |
| 4 | Mensuration, Cubes & Dices |
| 5 | Para Jumble, Permutations & Combinations |
| 6 | Blood Relations & Direction Sense, Manners & Etiquette |
| 7 | Idiom & Phrases, Prefix-Suffix |
| 8 | Probability. Puzzles |
| 9 | Data Sufficiency, Logical Choices & Connectives |
| 10 | Date Interpretations, Deductions |
| 11 | Essay Writing, E-mail Writing |
| 12 | Personal Grooming |

**Value Added Courses (VAC)**

**Code: BUVCSA2102 Environment and Sustainability 2 Credits [LTP: 2-0-0]**

# COURSEOUTCOMES

# Students would be able to:

CO1: Understanding of the concept of sustainable development

CO2: Classification of energy resources depending upon their origin and their conservation

CO3: Understanding of the Disaster Management

CO4: Summarize social issues related to population, resettlement and rehabilitation of project affected persons

CO5: Understanding of the local environmental assets with simple ecosystems and identify local flora and fauna.

1. **OUTLINE OF THE COURSE**

|  |  |  |
| --- | --- | --- |
| **Unit No.** | **Title of the Unit** | **Time required for the Unit (Hours)** |
| **1.** | **Introduction of Sustainable development concept** | **5** |
| **2.** | **Energy resources and conservation** | **5** |
| **3.** | **Disaster Management** | **5** |
| **4.** | **Role of Environment in Human Society** | **5** |
| **5.** | **Field Work** | **4** |

1. **DETAILED SYLLABUS**

|  |  |
| --- | --- |
| **Unit** | **Unit Details** |
| **1.** | **Introduction of Sustainable development concept** |
|  | * Introduction of Unit * Concept of sustainability and sustainable development. * Ecosystem: Structure and function of ecosystem * Energy flow in an ecosystem: food chains, food webs and ecological succession. * Case studies of the following ecosystems: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems * Biodiversity and Conservation * Conclusion & Real Life Application |
| **2.** | **Energy resources and conservation** |
|  | * Introduction of Unit * Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies. * Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. * International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD) * Conclusion & Real Life Application |
| **3.** | **Disaster Management** |
|  | * Introduction of the Unit * Disaster management: floods, earthquake, cyclones and landslides. * Climate change, global warming, ozone layer depletion |

|  |  |
| --- | --- |
|  | * Acid rain and impacts on human communities and agriculture * Conclusion & Real Life Application |
| 4. | **Role of Environment in Human Society** |
|  | * Introduction of Unit * Human population growth: Impacts on environment, human health and welfare. * Resettlement and rehabilitation of project affected persons; case studies. * Disaster management: floods, earthquake, cyclones and landslides. * Conclusion & Real Life Application |
| 5. | **Field Work** |
|  | * Introduction of Unit * Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc. * Visit to a local polluted site-Urban/Rural/Industrial/Agricultural. * Study of common plants, insects, birds and basic principles of identification. * Study of simple ecosystems-pond, river, dissert etc. * Conclusion & Real Life Application |

1. **RECOMMENDED STUDY MATERIAL:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr.**  **No** | **Reference Book** | **Author** | **Edition** | **Publication** |
| 1 | Natural Resource Conservation – Management for Sustainable Future | Owen, O.S, Chiras, D.D, &Reganold, J.P. | 1998 | Prentice Hall. |
| 2. | Fundamentals of Materials for Energy  and Environmental Sustainability. | Ginley, D.S. &Cahen, D | 2011 | Cambridge University  Press. |
| 3. | Environmental Science. | Miller, T.G. | 2012 | Wadsworth  Publishing Co |
| 4. | Conservation of Natural Resources | Klee, G.A | 2001 | Prentice Hall Publication. |