



BHARATI VIDYAPEETH

(Deemed to be University), Pune

'A+' Accreditation (Third Cycle) by 'NAAC' in 2017

Category-I Deemed to be University Graded by UGC

'A' Grade University Status by MHRD Govt. of India

Ranked 73rd by NIRF – 2022

FACULTY OF MANAGEMENT STUDIES

BACHELOR OF COMPUTER APPLICATION DEGREE

(THREE YEARS) / HONORS (FOUR YEARS)

FRAMED AS PER NATIONAL EDUCATION POLICY (NEP 2020)

SYLLABUS

Applicable with effect from 2022-23

Contents

Sr.No.	Particulars	Page No.
I	Preamble	3
II	Vision	3
III	Mission	3
IV	Aims	3
V	Learning Outcome Based Curriculum framework	4
VI	Duration of Programme	6
VII	Academic Bank of Credits (ABC)	6
VIII	Eligibility Criteria for admission	7
IX	Grading System for Programmes under faculty of Management Studies	7
X	Standard of Passing	8
XI	Award of Honors	10
XII	Rules of ATKT	11
XIII	Internship	11
XIV	Specializations	13
XV	Course Structure	14
XVI	Question Paper Patterns for University Examination	21
	Semester I Syllabus Contents	22

Bharati Vidyapeeth (Deemed to be University), Pune
Faculty of Management Studies

Bachelor of Computer Application (Honors) FOUR YEARS

Revised Course Structure (To be effective from 2022-2023)

I. BCA (Honors) Four Years Programme :

The Bachelor of Computer Application (Honors) Programme is a full time four year programme offered by Bharati Vidyapeeth (Deemed to be University), Pune and conducted in Regular mode at its management institutes located in New Delhi, Pune, Navi Mumbai, Kolhapur, Sangli, Karad and Solapur. All the seven institutes have excellent faculty members, computer laboratories, Libraries, and other facilities to provide proper learning environment to the students. The University is accredited by NAAC with 'A+' grade. The expectations and requirements of the Software Industry, immediately and in the near future, are considered while designing the BCA programme. While designing the BCA Programme, the above facts are considered and the requirements for higher studies and immediate employment are visualized. This effort is reflected in the Vision and Mission statements of the BCA programme, the statements also embody the spirit of the vision of Dr. Patangraoji Kadam, the Founder of Bharati Vidyapeeth — “Social Transformation Through Dynamic Education”

II. Vision:

Preparing the Students to cope with the rigor of Post Graduate Programmes in global and creating high caliber solution architects for software development, who will also be sensitive to societal concerns.

III. Mission:

- We aim to drive transformation, technology and innovation through problem solving approach and research development.
- We aim to provide students with the IT tools to become productive and lifelong learner.

IV. Aims:

- To impart quality computer education to enhance logical computing and programming skills.
- To implement innovative techniques and process in learning and evaluation.
- To further creativity and pursuit of excellence in computer applications.

V. Learning Outcome Based Curriculum Framework -

1. Programme Education Objectives:

The Bachelor of Computer Application (Honors) Four Years degree programme has the following objectives...

- I. To prepare the youth to take up positions as system analysts, system engineers, software engineers and programmers.
- II. To aim at developing 'systems thinking' 'abstract thinking', 'skills to analyze and synthesize', and 'skills to apply knowledge', through 'extensive problem solving sessions', 'hands on practice under various hardware/software environments' and 'projects developed'.
- III. To prepare students with 'social interaction skills', 'communication skills', 'life skills', 'entrepreneurial skills', and 'research skills' which are necessary for career growth and for leading quality life are also imparted.

2. Programme Outcomes (POs) :

On completion of BCA (Honors) Four Year Degree Programme the expected programme outcomes that a student should be able to demonstrate are the following:

PO1. Computational Knowledge: Understand and apply mathematical foundation, computing and domain knowledge for the conceptualization of computing models from defined problems.

PO2. Problem Analysis: Ability to identify, critically analyze and formulate complex computing problems using fundamentals of computer science and application domains.

PO3. Design / Development of Solutions: Ability to transform complex business scenarios and contemporary issues into problems, investigate, understand and propose integrated solutions using emerging technologies.

PO4. Conduct Investigations of Complex Computing Problems: Ability to devise and conduct experiments, interpret data and provide well informed conclusions.

PO5. Modern Tool Usage: Ability to select modern computing tools, skills and techniques necessary for innovative software solutions

PO6. Professional Ethics: Ability to apply and commit professional ethics and cyber regulations in a global economic environment.

PO7. Life-long Learning: Recognize the need for and develop the ability to engage in continuous learning as a Computing professional.

PO8. Project Management: Ability to understand management and computing principles with computing knowledge to manage projects in multidisciplinary environments.

PO9. Communication Efficacy: Communicate effectively with the computing community as well as society by being able to comprehend effective documentations and presentations.

PO10. Societal & Environmental Concern: Ability to recognize economical, environmental, social, health, legal, ethical issues involved in the use of computer technology and other consequential responsibilities relevant to professional practice.

PO11. Individual & Team Work: Ability to work as a member or leader in diverse teams in multidisciplinary environment.

PO12. Innovation and Entrepreneurship: Identify opportunities, entrepreneurship vision and use of innovative ideas to create value and wealth for the betterment of the individual and society.

3. Programme Specific Outcomes (PSOs) :

After the completion of the course, a student is able to

PSO1: Ability to learn the various programming languages with database concepts along with development environment

PSO2 : Ability to apply theoretical and practical knowledge to solve business problems through data communication technology concepts.

PSO3 : Flourish the innovation and research attitude to develop IT artifact.

PSO4: Foster analytical and critical thinking abilities for efficient programming

PSO5: Demonstrate and apply the programming knowledge to develop effective software solution.

PSO6: Enrich the knowledge in the areas of Advanced technologies and business practices.

PSO7: Maintain the personality with environmental and social concerns

4. Graduate Attributes:

After completing BCA (Honors) Four Year Degree programme the students will be able to acquire following attributes and skills to groom the overall personality.

- **Knowledge of Discipline of Computer Science:** This Graduate will be capable of demonstrating comprehensive and considered knowledge of a discipline. Student enables to evaluate and utilize information and apply their knowledge and professional skills in the field of IT.
- **Creativity:** Graduates will be trained to develop skills needed for creativity to design and implement computer application software. Also able to think and imagine IT solution for real life problems / applications.
- **Intellectual Rigour:** The graduates are expected to have clarity in thinking. Graduates will be involved to develop constructively and methodically, exploring ideas, theories and philosophies. It also relates to the ability to analyse and construct knowledge with depth, insight and intellectual maturity.
- **Problem Solving and Design:** Graduate empower not only within the context of their programmes, but also in their personal and professional lives. Graduate should have ability to identify problems, think creatively to find alternative solutions and evaluate those for selecting effective algorithm to solve the problem efficiently.
- **Ethical Practices:** Graduate should adopt tolerance, responsibility, open-mindedness about cultural diversity, linguistic difference, and the complex nature of our world. Graduate should behave appropriately towards colleagues and the community and being sensitive to local and global social justice issues
- **Communication and Social Skills:** Graduate have the ability to communicate clearly and to work well in a team setting is critical to sustained and successful employment. Good communication and social skills involve the ability to listen to, as well as clearly express information back to others in a variety of ways - oral, written, and visual - using a range of technologies.
- **Life-Long Learning:** Graduate is having open, curious, willing to investigate, and consider new knowledge and ways of thinking. He / She should able to adopt and grasp the new upcoming technologies in IT sector.
- **Self-Management:** Graduates must have capabilities for self-organisation, self-review, personal development and lifelong learning.
- **Critical thinker and problem solver:** Ability to employ critical thinking and efficient problem solving skills for different kinds of problem related to computer science
- **Team player/worker:** Capable of working effectively in diverse teams in both classroom, laboratory, in industry and project-based situations.

VI. Duration:

The duration of the BCA Bachelor's degree Program having six semesters and BCA (Honors) Degree Program is of four years spread across Eight Semesters with multiple entry and exit options. Student should complete the 4 years degree programme within 7 years.

a) Following EXIT options are available with the students:

Exit Option	Minimum Credits Requirements	NSQF Level	Bridge course
Under graduate Certificate - After successful completion of First Year	40	5	10 credits bridge course(s) lasting two months including at least 06 credits job specific internship that would help the learner to acquire job ready competencies to enter the workforce.
Under graduate Diploma - After successful completion of Second Year	80	6	
Bachelor's Degree - After successful completion of Third Year	120	7	
Bachelor's Degree with Honors - After successful completion of Fourth Year OR Bachelor's Degree with Honors (Research) - After successful completion of Fourth Year	160	8	

Note : Student is free to complete some interdisciplinary courses from other institutes provided he/she should earn 50% required credits from home HEI.

Student should complete the core disciplinary courses from home University (HEI) to get exit option for UG certificate/ UG diploma/ Bachelor Degree.

b) Following Entry options are available with the students :

- Student who opt Exit option at the end of 1st / 2nd / 3rd year, can reenter the same programme within three years from Exit.
- Student with Bachelors Degree can opt for Bachelor degree with Honors
- Student with Bachelors Degree can opt for Bachelor degree with Honors (Research) if the student secure CGPA ≥ 7.5

National Skills Qualifications Framework (NSQF) Levels :

Option	NSQF Level	Professional Knowledge	Skill
At the end of first year	5	Knowledge of facts, principles, processes, concepts in a field of work or study	The student will have fundamental knowledge of computation, problem solving ability and basic website designing ability.
At the end of Second year	6	Factual and theoretical knowledge in the broad context within a field of work or study	Additionally the student will have advanced programming skills along with system development ability
At the end of Third year	7	Wide ranging factual and theoretical knowledge in the broad context within a field of work or study	Additionally, student will have skills of Web Application development with Technical Writing and Report Generation.
At the end of Fourth year	8	Comprehensive, cognitive theoretical knowledge and practical skills to develop creative solutions to abstract problem	Additionally, student will have skills of solving business application applying advanced technology

VII. Academic Bank Of Credits (ABC) :

As per the National Educational Policy (NEP) 2020, the Academic Bank of Credit offer the flexibility of curriculum framework and interdisciplinary /multidisciplinary academic mobility of students across Higher Educational Institutes (HEIs) with appropriate credit transfer mechanism. In furtherance to these guidelines the Faculty of Management Studies, Bharati Vidyapeeth (Deemed to be University) Pune has designed a four years undergraduate program offered at its constituent units.

As a pre-requisite a student should register in the Bharati Vidyapeeth (Deemed to be University) Academic Bank of Credit. The credits earned by the student/learner will be stored in it. A Student/learner would be required to complete the course as per the ABC (Academic Bank Credit) policy of UGC. The validity of the credits earned for a course is seven years only.

VIII. Eligibility Criteria for admission:

A candidate applying for BCA(Honors) Four years programme should have passed higher secondary (10 + 2) or equivalent examination (10+3) of any recognized Board with satisfying the conditions to pass a common All India Entrance test (BU-MAT) conducted by Bharati Vidyapeeth (Deemed to be University), Pune. The final admission is based solely on the merit at the BU-MAT test.

IX. Grading System for Programmes under Management Studies:

- **Grade Points** : The Faculty of Management Studies, Bharati Vidyapeeth (Deemed to be University) has suggested 10-point grading system for all programmes designed by its various Board of Studies. A grading system is a 10-point system if the maximum grade point is 10. The system is given in Table I below.

Table I: The 10-point Grading System Adapted for Programmes under FMS

Range of Percent Marks	[80,100]	[70,79]	[60,69]	[55,59]	[50,54]	[40,49]	[00,39]
Grade Point	10.0	9.0	8.0	7.0	6.0	5.0	0.0
Grade	O	A+	A	B+	B	C	D

Formula to calculate GP is as under:

Set $x = \text{Max}/10$ where Max is the maximum marks assigned for the examination (i.e. 100)

Formula to calculate the individual evaluation

Range of Marks	Formula for the Grade Point
$8x \leq \text{Marks} \leq 10x$	10
$5.5x \leq \text{Marks} \leq 8x$	Truncate (M/x) +2
$4x \leq \text{Marks} \leq 5.5x$	Truncate (M/x) +1

➤ **Scheme of Examination**

Courses having Internal Assessment (IA) and University Examinations (UE) shall be evaluated by the respective constituent units and the University at the term end for **40** and **60** Marks respectively. The total marks of IA and UE shall be 100 Marks and it will be converted into grade points and grades.

For Comprehensive Continuous Assessment (CCA) The subject teacher may use the following assessment tools:

- Class Tests**
- Presentations**
- Class Assignments**
- Case studies**
- Practical Assignments**
- Mini Projects**
- Oral**

- h) **MOOCs** - The Bharati Vidyapeeth (Deemed to be University), Pune offering MOOCS (Massive Open Online Courses Subjects) so as to provide wide access to online learning. The student will complete MOOCS courses as a part of Continuous Evaluation System (CES)

X. Standard of Passing:

For all courses, both UE and IA constitute separate heads of passing. In order to pass in such courses and to earn the assigned credits, the student/learner must obtain a minimum grade point of 5.0 (40% marks) at UE and also a minimum grade point of 5.0 (40% marks) at IA.

If Student fails in IA, the learner passes in the course provided, he/she obtains a minimum 25% marks in IA and GPA for the course is at least 6.0 (50% in aggregate). The GPA for a course will be calculated only if the learner passes at UE.

A student who fails at UE in a course has to reappear only at UE as backlog candidate and clear the Head of Passing. Similarly, a student who fails in a course at IA he has to reappear only at IA as backlog candidate and clear the Head of Passing to secure the GPA required for passing.

The 10 point Grades and Grade Points according to the following table

Range of Marks (%)	Grade	Grade Point
$80 \leq \text{Marks} \leq 100$	O	10
$70 \leq \text{Marks} < 80$	A+	9
$60 \leq \text{Marks} < 70$	A	8
$55 \leq \text{Marks} < 60$	B+	7
$50 \leq \text{Marks} < 55$	B	6
$40 \leq \text{Marks} < 50$	C	5
Marks < 40	D	0

The performance at UE and IA will be combined to obtain GPA (Grade Point Average) for the course. The weights for performance at UE and IA shall be 60% and 40% respectively.

GPA is calculated by adding the UE marks out of 60 and IA marks out of 40. The total marks out of 100 are converted to grade point, which will be the GPA.

Formula to calculate Grade Points (GP)

Suppose that “Max” is the maximum marks assigned for an examination or evaluation, based on which GP will be computed. In order to determine the GP, Set $x = \text{Max}/10$ (since we have adopted 10 point system). Then GP is calculated by the following formulas

Range of Marks	Formula for the Grade Point
$8x \leq \text{Marks} \leq 10x$	10
$5.5x \leq \text{Marks} < 8x$	Truncate (M/x) +2
$4x \leq \text{Marks} < 5.5x$	Truncate (M/x) +1

Two kinds of performance indicators, namely the Semester Grade Point Average (SGPA) and the Cumulative Grade Point Average (CGPA) shall be computed at the end of each term. The SGPA measures the cumulative performance of a learner in all the courses in a particular semester, while the CGPA measures the cumulative performance in all the courses since his/her enrolment. The CGPA of learner when he /she completes the programme is the final result of the learner.

The SGPA is calculated by the formula

$$SGPA = \frac{\sum C_k * GP_k}{\sum C_k}$$

where, C_k is the Credit value assigned to a course and GP_k is the GPA obtained by the learner in the course. In the above, the sum is taken over all the courses that the learner has undertaken for the study during the Semester, including those in which he/she might have failed or those for which he/she remained absent. **The SGPA shall be calculated up to two decimal place accuracy.**

The CGPA is calculated by the following formula

$$CGPA = \frac{\sum C_k * GP_k}{\sum C_k}$$

where, C_k is the Credit value assigned to a course and GP_k is the GPA obtained by the learner in the course. In the above, the sum is taken over all the courses that the learner has undertaken for the study from the time of his/her enrolment and also during the semester for which CGPA is calculated.

The CGPA shall be calculated up to two decimal place accuracy.

The formula to compute equivalent percentage marks for specified CGPA: = (Final CGPA-0.5)*10

XI. Award of Honours:

A student who has completed the minimum credits specified for the programme shall be declared to have passed in the programme. The final result will be in terms of letter grade only and is based on the CGPA of all courses studied and passed. The criteria for the award of honours are given below.

Range of CGPA	Final Grade	Performance Descriptor	Equivalent Range of Marks (%)
$9.5 \leq \text{CGPA} \leq 10$	O	Outstanding	$80 \leq \text{Marks} \leq 100$
$9.0 \leq \text{CGPA} \leq 9.49$	A+	Excellent	$70 \leq \text{Marks} < 80$
$8.0 \leq \text{CGPA} \leq 8.99$	A	Very Good	$60 \leq \text{Marks} < 70$
$7.0 \leq \text{CGPA} \leq 7.99$	B+	Good	$55 \leq \text{Marks} < 60$
$6.0 \leq \text{CGPA} \leq 6.99$	B	Average	$50 \leq \text{Marks} < 55$
$5.0 \leq \text{CGPA} \leq 5.99$	C	Satisfactory	$40 \leq \text{Marks} < 50$
CGPA below 5.0	F	Fail	Marks below 40

XII. Rules of ATKT:

- a) For admission to Semester V of BCA Third year, Students/Learners should pass all the courses under Sem I and II.
- ii) For admission to Semester VII of BCA Fourth year, Students/Learners should pass all the courses under Sem,III and IV.

XIII. INTERNSHIP:

At the end of Semester VI, each student shall undertake Internship in an Industry for 50 (Fifty Days). It is mandatory for the students to seek written approval from the Faculty Guide about the Topic & the Organisation before commencing the Internship.

During the Internship students are expected to take necessary guidance from the faculty guide allotted by the Institute. To do it effectively they should be in touch with their guide through e-mail or telecom. Internship Project should be a Computer Application to Real life business activity.

The learning outcomes and the utility to the organization must be highlighted in Internship Project Report.

General chapterization of the report shall be as under;

- 1) Introduction
- 2) Theoretical background
- 3) Company profile
- 4) Objectives of the study
- 5) System Requirements
- 6) System Analysis & Design
- 7) Implementation & Testing
- 8) Conclusion & Suggestions

References:

Annexure: -

TECHNICAL DETAILS:

1. The report shall be printed on A-4 size white bond paper.
2. 12 pt. Times New Roman font shall be used with 1.5 line spacing for typing the report.
3. 1" margin shall be left from all the sides.
4. Considering the environmental issues, students are encouraged to print on both sides of the paper.
5. The report shall be hard bound as per the standard format of the cover page given by the Institute and shall be golden embossed.
6. The report should include a Certificate (on company's letter head) from the company duly signed by the competent authority with the stamp.
7. The report shall be signed by the respective guide(s) & the Director of the Institute 10 (Ten) days before the viva-voce examinations.
8. Student should prepare two hard bound copies of the Summer Internship Project Report and submit one copy in the institute. The other copy of the report is to be kept by the student for their record and future references.
9. In addition to this students should prepare two soft copies of their Summer IP reports & submit one each in Training & Placement Department of the Institute & Library

The Internship shall be assessed out 200 Marks. The breakup of these marks is as under;

Viva- voce examination = 120 (One Hundred Twenty) Marks

Internship Report = + 80 (Eighty) Marks

200 (Two Hundred) Marks

The examiners' panel shall be decided as per the guidelines received from the University.

The viva –voce shall evaluate the project based on

- i. Actual work done by the student in the organization
- ii. Student's knowledge about the company & Business Environment
- iii. Learning outcomes for the student
- iv. Utility of the study to the organization

XIV. Specializations:

BCA three year degree programme and BCA(Hons.) four year degree programme 2022 offers specialization to the students/learners in the third year of both the programmes. The students/learner are required to select any one specialization from the list provided below.

Sr. No.	Specialization Course	Course No	Course Name
01	Data analysis	505-1-A	Data analysis using Excel
		605-1-B	R Programming
02	Information Security	505-2-A	Information Security Concepts
		605-2-B	Information Security Administration
03	Big Data	505-3-A	Introduction to Big Data
		605-3-B	HADOOP
04	Information Systems	505-4-A	E-Commerce
		605-4-B	Knowledge Management

Prerequisite for offering the specialization –

- There must be minimum 10 (Ten) students for a particular specialization.

XV. Course Structure:**SEMESTER I**

Course Number	Course Title	Course Type	Credits	Hours / Week			IA	EoTE	Total Marks
				L	T	P			
101	Fundamentals of Information Technology	DSC	3	3	1	-	40	60	100
102	C Programming	DSC	3	3	1	-	40	60	100
103	Organization of IT Business	MDC	3	3	1	-	40	60	100
104	Discrete Mathematics	MDC	3	3	1	-	40	60	100
105	Lab on MS-Office Suite	DSC	2	-	-	4	40	60	100
106	Lab on C Programming	DSC	2	-	-	4	40	60	100
107	Human Universal Values	VBC	2	2	-		50	-	50
108	Language – I	AEC	2	2	-	-	50	-	50
Total			20	16	4	8	340	360	700

SEMESTER II

Course Number	Course Title	Course Type	Credits	Hours / Week			IA	EoTE	Total
				L	T	P			
201	Web Development Technology	DSC	3	3	1	-	40	60	100
202	DBMS I	DSC	3	3	1	-	40	60	100
203	Data Structures using C	DSC	3	3	1	-	40	60	100
204	Financial Accounting	MDC	3	3	1	-	40	60	100
205	Lab on Data Structures using C	DSC	2	-	-	4	40	60	100
206	Lab on Web Development Technology	DSC	2			4	40	60	100
207	Environmental Studies	VBC	2	2	-	-	50	-	50
208	Community Work (Swaccha Bharat Abhiyan)	VBC	2	2	-	-	50	-	50
Total			20	16	4	8	340	360	700

SEMESTER III

Course Number	Course Title	Course Type	Credits	Hours / Week			IA	EoTE	Total
				L	T	P			
301	Operating Systems	DSC	3	3	1	-	40	60	100
302	Software Engineering	DSC	3	3	1	-	40	60	100
303	Java Programming	DSC	3	3	1	-	40	60	100
304	Statistics	MDC	3	3	1	-	40	60	100
305	Lab on Oracle	DSC	2	-	-	4	40	60	100
306	Lab on Java	DSC	2	-	-	4	40	60	100
307	Start-up Management	AEC	2	2	-	-	50	-	50
308	Yoga & Meditation	VBC	2	2	-	-	50	-	50
Total			20	16	4	8	340	360	700

SEMESTER IV

Course Number	Course Title	Course Type	Credits	Hours / Week			IA	EoTE	Total
				L	T	P			
401	Computer Networks	DSC	3	3	1	-	40	60	100
402	Advanced JAVA	DSC	3	3	1	-	40	60	100
403	Advanced HTML with Javascript and CSS	DSC	3	3	1	-	40	60	100
404	Optimization Techniques	MDC	3	3	1	-	40	60	100
405	Lab on JAVA,	DSC	2	-	-	4	40	60	100
406	Lab on HTML, Javascript and CSS & Minor Project - I	DSC	2	-	-	4	40	60	100
407	Cyber security	SEC	2	2	-	-	50	-	50
408	Mathematical Aptitude	AEC	2	2	-	-	50	-	50
Total			20	16	4	8	340	360	700

SEMESTER V

Course Number	Course Title	Course Type	Credits	Hours / Week			IA	EoTE	Total
				L	T	P			
501	Basic Python Programming	DSC	3	3	1	-	40	60	100
502	Dot Net programming using C#	DSC	3	3	1	-	40	60	100
503	Entrepreneurship Development	MDC	3	3	1	-	40	60	100
504	Elective I	DSE	3	3	1	-	40	60	100
505	Lab on Python	DSC	2	-	-	4	40	60	100
506	Lab on Dot Net and C#	DSC	2	-	-	4	40	60	100
507	IT based Aptitude	AEC	2	2	-	-	50	-	50
508	Human Rights	VBC	2	2	-	-	50	-	50
Total			20	16	4	8	340	360	700

SEMESTER VI

Course Number	Course Title	Course Type	Credits	Hours / Week			IA	EoTE	Total
				L	T	P			
601	Data warehousing and Data Mining	DSC	3	3	1	-	40	60	100
602	Web Programming (PHP)	DSC	3	3	1	-	40	60	100
603	Software Project Management	DSC	3	3	1	-	40	60	100
604	Elective II	DSE	3	3	1	-	40	60	100
605	Lab on Web programming with Project	DSC	2	-	-	4	40	60	100
606	Lab on Data Visualization	DSC	2	-	-	4	40	60	100
607	Digital marketing	SEC	2	2	-	-	50	-	50
608	Indian Culture	VBC	2	2	-	-	50	-	50
Total			20	16	4	8	340	360	700

SEMESTER VII

Course Number	Course Title	Course Type	Credits	Hours / Week			IA	EoTE	Total
				L	T	P			
701	Cloud Computing	DSC	3	3	1	-	40	60	100
702	Mobile Application Development	DSC	3	3	1	-	40	60	100
703	Internet of Things	DSC	3	3	1	-	40	60	100
704	Object Oriented Analysis and Design	DSC	3	3	1	-	40	60	100
705	Research Methodology	RM	3	3	1	-	40	60	100
706	Lab on IOT	DSC	2	-	-	4	40	60	100
707	Lab on Mobile Application Development	DSC	2	-	-	4	40	60	100
708	Technical Writing	SEC	1	2	-	-	50	-	50
Total			20	17	5	8	330	420	750

SEMESTER VIII

Course Number	Course Title	Course Type	Credits	Hours / Week			IA	EoTE	Total
				L	T	P			
801	Introduction to AI and ML	DSC	3	3	1	-	40	60	100
802	ERP	DSC	3	3	1		40	60	100
803	Block Chain Technology	DSC	3	3	1	-	40	60	100
804	Internship Project	SEC	6	-	-	8	80	120	200
805	Professional Ethics	MDC	3	3			40	60	100
806	Organisational Behaviour	VBC	1	2			50		50
807	IPR	AEC	1	2			50		50
Total			20	13	-	8	340	360	700

Fourth years of BCA Honors Programme with Research

SEMESTER VII

Course Number	Course Title	Course Type	Credits	Hours / Week			IA	EoTE	Total
				L	T	P			
701	Cloud Computing	DSC	3	3	1	-	40	60	100
702	Mobile Application Development	DSC	3	3	1	-	40	60	100
703	Internet of Things	DSC	3	3	1	-	40	60	100
704	Object Oriented Analysis and Design	DSC	3	3	1	-	40	60	100
705	Research Methodology	RM	3	3	1	-	40	60	100
706	Lab on IOT	DSC	2	-	-	4	40	60	100
707	Lab on Mobile Application Development	DSC	2	-	-	4	40	60	100
708	Technical Writing	SEC	1	2	-	-	50	-	50
Total			20	17	5	8	330	420	750

SEMESTER VIII

Course Number	Course Title	Course Type	Credits	Hours / Week			IA	EoTE	Total
				L	T	P			
801	Dissertation	RM	12				100	300	400
802	Seminar on Recent Trends In Computer Science and Information Technology : Literature Review	RM	3				100		100
803	Professional Ethics	MDC	3	3			40	60	100
804	Organisational Behaviour	VBC	1	2			50	-	50
805	IPR	AEC	1	2			50	-	50
Total			20	13	-	8	340	360	700

Abbreviations Expanded

- **DSC** - Discipline Specific Course
- **DSE** - Discipline Specific Elective
- **MDC** – Minor Disciplinary Course
- **SEC** - Skill Enhancement Course
- **VBC** - Value Based Course
- **AEC** - Ability Enhancement Course
- **RW** – Research Work

XVI. Question Paper Patterns for University Examination:

The pattern of **question paper** for the courses having University Examinations will be as follows:

Title of the Course

Day:

Total Marks: 100

Date:

Time: 03 Hours

Instructions:

- a. Attempt any FIVE questions from Section I Each question carries 12 Marks.**
- b. Attempt any TWO questions from Section II Each question carries 20 Marks.**

SECTION – I	
<i>It should contain 07 questions covering the syllabus & should test the conceptual knowledge of the students</i>	
Question	Marks
Q.1	(12 marks)
Q.2	(12 marks)
Q.3	(12 marks)
Q.4	(12 marks)
Q.5	(12 marks)
Q.6	(12 marks)
Q.7 Write Short Notes on ANY TWO	(12 marks)
SECTION – II	
<i>It should contain 03 questions covering the entire syllabus & should be based on application of the Concepts</i>	
Q.8.....	(20 marks)
Q.9.....	(20 marks)
Q.10.....	(20 marks)

***Note : 100 marks will be converted to 60 as per BVDU, Pune Examination Section Scaling down**

Programme: BCACBCS– RevisedSyllabusw.e.f.-Year2022 –2023			
Semester	Course Code	Course Title	
I	101	Fundamental of IT	
Type	Credits	Evaluation	Marks
Core Disciplinary Course	3	IE&UA	100
Course Objectives:			
To make students to: <ul style="list-style-type: none"> ▪ The main objective is to introduce I T in a simple language to all undergraduate students, regardless of their specialization. ▪ It will help them to pursue specialized programs leading to technical and professional careers and certifications in the IT industry. ▪ The focus of the subject is on introducing skills relating to IT basics ▪ To develop computer applications, programming, interactive medias, Internet basics 			
Course Outcomes:			
After completing the course the students shall be able to <ul style="list-style-type: none"> • Understand basics of Computer • Remember types of computer and its peripherals • Applying utility skill using MS-office tools 			

Unit	Sub Unit	Competency	Competency Indicators	Sessions
Introduction to Computer	<ul style="list-style-type: none"> • Computer-Definition, Characteristics, Concept of Hardware, Software , Evolution of computer and Generations • Types of Computer – Analog and Digital computers, Hybrid Computers, General Purpose and Special Purpose Computer • Limitations of Computer, Applications of Computer in Various Fields. 	Have a basic understanding of personal computers and their operations.	Understand and remembering Computer S/W, H/W and its generation, types of computers.	19

	<ul style="list-style-type: none"> • Input Device – Keyboard, Mouse, Scanner, MICR, OMR. • Output Devices – VDU, Printers – Dot Matrix, Daisy-wheel, Inkjet, Laser, Line Printers and Plotters. 	Understand basic concepts and terminology of information technology.	In detail analyze I/O devices and it's operations.	8
Computer Memory	<ul style="list-style-type: none"> • Memory Concept, Memory Cell, Memory Organisation, Semiconductor Memory – RAM, ROM, PROM, EPROM • Secondary Storage Devices – Magnetic Tape, Magnetic Disk (Floppy Disk and Hard Disk.), Compact Disk. 	Identify common computer hardware and software elements and understand how they interact with each other	Use of primary and secondary Memory	8
Softwares	<ul style="list-style-type: none"> • Software and its needs, Types of S/W. System Software: Operating System, Utility Programs Programming Language: Machine Language, Assembly Language, High Level Language their advantages & disadvantages. • Application S/W and its types: Word Processing, Spread Sheets, Presentation, Graphics, DBMS s/w • Concept of Network and its Type, Basic Elements of a Communication 	Software and its needs, Operating System, Utility Programs and Programming Languages	Awareness of basic languages, databases, networks with in computer systems.	8

	System, Data Transmission Media, Topologies			
MS-office	<ul style="list-style-type: none"> • MS Office: Introduction to MS Office, Components and Features. • MS Word: Creating Letter, Table, Fonts, Page Layout Document, Formatting, Spell Check, Print Preview, Template, Color, Mail Merge, Auto Text, Inserting Picture, Word Art. • MS Excel: Introduction to Excel, Sorting, Queries, Graphs, Scientific Functions. • PowerPoint: Introduction to PowerPoint, Creation of Slides, Inserting Pictures, Preparing Slide Show with Animation. • MS Access: Creation and Manipulation of Files. 	Demonstrate how to MS-Office software tools for word processing, mathematical processing and presentations.	Developing skill of preparing documents, presentation and storing of simple data in databases.	12

Reference Books:

Sr.No.	Name of the Author	Title of the Book	Year Edition	Publisher Company
1	P.K.Sinha	Computer Fundamentals	2015 (6 th Edition)	BPB Publication
2	V.Rajaraman	Fundamentals of Computers	2001(3 rd Edition)	PHI Publication
3	Vishnu Singh	Quick Reference for MS-Office 2007	2008	Asian Publisher

Online Resources:

Online Resources No.	Web site address
1	https://www.udemy.com/course/fundamentals-of-information-technology/
2	https://www.youtube.com/watch?v=DLb8IFee-DI
3	https://www.youtube.com/watch?v=mOYpH24GR6Y
4	https://www.youtube.com/watch?v=j8hVRx2AFP0

MOOCs:

Resources No.	Web site address
1	https://www.classcentral.com/course/swayam-introductory-concepts-of-digital-computing-45159
2	https://www.classcentral.com/course/swayam-sr-secondary-computer-science-330-17803
3	https://www.classcentral.com/course/edx-information-technology-foundations-17970

Programme:BCACBCS– RevisedSyllabusw.e.f.-Year2022 –2023				
Semester		Course Code	Course Title	
I		102	Algorithm and Program design	
Type	Credits	Evaluation	Marks	
Core Course	3	IE&UA	100	
Course Objectives:				
To make students to: <ul style="list-style-type: none">Understand good principles of algorithm design,Elementary analysis of algorithms.Choose appropriate sort and search technique and designing correct and efficient algorithms				
Course Outcomes:				
After completing the course the students shall be able to <ul style="list-style-type: none">Understand basics of AlgorithmDeveloping simple and complex algorithms viz. using array.Perform competitive analysis.				
Unit	Sub Unit	Competency	Competency Indicators	Sessions
Introduction	<ul style="list-style-type: none">Concept, of Problem, Procedure and AlgorithmAlgorithm Representation through Pseudo - Code and Flow - ChartsTracing of Algorithms Such as Swapping, Counting, Finding the Sum, Product, maximum, minimum, of a list of numbers.	Argue the correctness of algorithms using inductive proofs and invariants.	Understand and remembering Algorithm . Tracing of Algorithms.	8
Concept of Structures Programming and Procedure	<ul style="list-style-type: none">Introduction, Concept, Basic Control Structure	Learn good principles of algorithm design	In detail analyze Programming concept and	10

Oriented Programming	<ul style="list-style-type: none"> • Benefits of Structured Programming • Procedure Oriented Programming 		structure of programming.	
Design of Algorithm and Implementation through programming	<ul style="list-style-type: none"> • Problem Analysis and Design of Algorithms for problems such as (1) Swapping (2) Counting (3) Finding the Sum, Product, maximum, minimum of a finite list of numbers. • Again Simple variations of the above problem realization that, there may be alternative algorithm and that one algorithm may be better (in some sense) than the other. 	Learn how to analyze algorithms and estimate their worst-case and average-case behavior (in easy cases)	Skill for development of alternative algorithm development.	10
Problem Analysis and Design	<ul style="list-style-type: none"> • Design of algorithm for problem such as generating prime numbers, Evaluation of polynomial, Sum of first n factorials, Finding nth term of Fibonacci sequence. • Design of algorithm for problem such as Finding largest and second largest of list • Compute GCD and Base Conversion 	Analyze randomized algorithms. Employ indicator random variables and linearity of expectation to perform the analyses. Recite analyses of algorithms that employ this method of analysis.	Analyze the generated output of the various programs designed and developed.	12

Concept of Array, Search and Sort Techniques	<ul style="list-style-type: none"> • Introduction of Array, Array manipulation such as removing the duplicates • Partitioning of an array. The problem of search, Linear, Binary search algorithms • The Problem of Sorting, Selection, Insertion and Bubble sort 	Programming using arrays and perform operations on it. Implement search and sort techniques	Perform competitive analysis and study the applicability.	12
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Reference Books:

Sr.No.	Name of the Author	Title of the Book	Year Edition	Publisher Company
1	Dromey R.G	How to Solve it by a Computer	2007 (1st Edition)	PHI Publication
2	V.Rajaraman	Fundamentals of Computers	2005(2 nd Edition)	PHI Publication
3	Vishnu Singh	Quick Reference for MS-Office 2007	2009(2 nd Edition)	Asian Publisher

Online Resources:

Online Resources No.	Web site address
1	https://www.udemy.com/course/design-and-analysis-of-algorithm-/
2	https://www.youtube.com/watch?v=1jAI-kjKelY
3	https://www.youtube.com/watch?v=8hly31xKli0
4	https://www.youtube.com/watch?v=86DA9Kn_Z0k

MOOCs:

Resources No.	Web site address
1	https://www.classcentral.com/course/swayam-design-and-analysis-of-algorithms-3984
2	https://www.classcentral.com/course/swayam-data-structures-13983
3	https://www.classcentral.com/course/swayam-parameterized-algorithms-43643

Programme:BCA CBCS– Revised Syllabus w.e.f.-Year 2022 –2023				
Semester	CourseCode	CourseTitle		
I	103	C Programming		
Type	Credits	Evaluation	Marks	
Core Disciplinary Course	3-1-0= 3C	IE&UA	100	
Course Objectives:				
This is a first course in programming. The objective of this paper is to teach the Programming Language C. However, the process of learning a computer language will also be emphasized. Emphasis is also on semantics and problem solving.				
Course Outcomes:				
After completing the course the students shall be able to				
<ul style="list-style-type: none">• To solve a given problem using programming/algorithm• Understand and use control statements and operators• Read, understand and design C programs using control structures.• Effectively use of Arrays and functions and implement Programs with pointers, perform pointer arithmetic, and use the pre-processor.• Write C program for simple applications of real life using structures and Unions.				
Unit	Sub Unit	Competency	Competency Indicators	Sessions
Introduction to C Language	<ul style="list-style-type: none">• History• Structure of C Programming, Function as building blocks• Language Fundamentals, Character set, C Tokens, Keywords, Identifiers, Variables, Constant,• Data Types, Comments	Defining keywords, identifiers, variables, constants in C	Understand the basics of C Programming	5
Operators	<ul style="list-style-type: none">• Types of operators, Operator Precedence and Associativity• Expression, Statement and types of statements• Built in Operators and functions• Console based I/O and related built in I/O function- printf(), scanf(), getch(), getchar(), putchar(),• Concept of header files, Preprocessor directives - #include, #define	Learn Operator set, statement types, input and output statement	Understanding of input output statements and write simple programs	7

Control Structures	<ul style="list-style-type: none"> • Decision making structures - if statement, if-else statement, Nested if-else statement, switch statement • Loop Control structures - while loop, do-while loop, for loop, Nested for loop • Other statements - break keyword, continue keyword, goto keyword, exit function 	Use of decision making and looping statements for program writing	Program writing using decision making and looping statements	10
Functions and Arrays	<ul style="list-style-type: none"> • Introduction • Purpose of function, Function declaration/ Function prototype, Function definition, Function call, return statement • Function parameters • Types of functions • Call by value • Storage classes • Recursion, Examples on recursive function • Introduction to one-dimensional Array, Definition, Declaration, Initialization, Accessing and displaying array elements • Arrays and functions • Introduction to two-dimensional Array, Definition, Declaration, Initialization, Accessing and displaying array elements 	Concept of Function, Array and its type	Understanding of use of function and array and implement it to understand the functionalities of same	15
Strings, Structure and Pointers	<ul style="list-style-type: none"> • Introduction to Strings, Definition, Declaration, Initialization • Input, output statements for strings • Standard String library functions with example • Structure – User defined data types, Concept of structure, Union; Member access operator • Introduction to pointer, Definition, Declaring and Initializing pointer variable 	String and its manipulation functions User defined data types i.e. Structure and Union	Writing C Program for string handling and use of Structure and Union	8

	<ul style="list-style-type: none"> • Indirection operator and address of operator, Accessing variable through pointer, Pointer arithmetic • Dynamic memory allocation 			
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Reference Books:

Sr.No.	Name of the Author	Title of the Book	Year Edition	Publisher Company
1	Yashwant Kanetkar	Let us C	2018	BPB Publications
2	B.W.Kernighan, D.M.Ritchie	The 'C' programming language	1998	PHI
3	Balaguruswami	Programming in ANSIC	2019	TMH

MOOCs:

Resources No.	Website address
1	NPTEL / Swayam
2	www.edx.com
3	www.coursera.com

Programme:BCA CBCS – Revised Syllabus w.e.f. - Year 2022 – 2023				
Semester	Course Code	Course Title		
I	104	Organization of IT Business		
Type	Credits	Evaluation	Marks	
Core Disciplinary Course	3	IE& UA	100	
Course Objectives :				
To acquaint students with fundamentals of Business Organization and management systems as abody of knowledge.				
Course Outcomes:				
<ul style="list-style-type: none">• To know about business and its structure also students shall know about various forms of business• To acquire sound knowledge about overall business environment• To Apply and enlighten with nature and scope of IT business organization• To enable them with office equipments and system• To make them understand the office function and its significance on office layout• To understand the complexities associated with management of human resources in the IT organizations and integrate the learning in handling these complexities.				
Unit	Sub Unit	Competency	Competency Indicators	Sessions
Nature and Evolution of Business	Concept of Business – Meaning, Definition, Nature and Scope, Characteristics of Business. Business as an Economic Activity. Objectives of Business. Structure of Business (Classification of Business Activities. Requisites for Success in Modern Business. Beginning and development of Commerce, Evolution of Industry, IndustrialRevolution, Beginning and growth of Indian Business, Industrialization in India	Basics of Business	Studying Basics of Business Structure	10
Forms of Business Ownership	Introduction to various forms – Factors affecting choices of an deal form of ownership, features Merits and Demerits of Sole Proprietorship – Joint	Different types of business	Study each business type with is merits and demerit	10

	Hindu Family Business – Partnership – Joint Stock Company – Co-operative Organization, Public Enterprises.			
Formation of a Company	Stages in formation and incorporation of a company (e Promotion – incorporation and registration – Capital Subscription - Commencement of Business. - Documents of a Company i.e. Memorandum of Association – Articles of Association – Prospectus.	Documentation for company formation	Study different documents required to operate business	10
The Impact of information technology on the Business	Modern Organizations- IT runs the Airlines, Technology Transforms, Securities Industry, Creating New Types of Organization- Examples of Designs using IT Variables, Adding peoples to the design.	Use of IT in Organization	Study the application of IT in Business Process	10
Strategic Issues of Information Technology	IT and Corporate Strategy- Some examples of Technology strategy, value chain, A framework for the strategic use of IT. Creating and sustaining a Competitive edge- Using resource to advantage, protecting an IT innovation. Integrating Technology with the Business Environment.	Corporate Strategy for running Business with IT	Different Corporate Strategy for Business using IT	5

Reference Books:

Sr. No.	Name of the Author	Title of the Book	Year Edition	Publisher Company
1	S.A. Sherlekar	Modern Business Organization and Management	latest edition	Himalaya Publishing House)
2	Y.K. Bhushan	Fundamental of Business Organization & Managemen	latest edition	S Chand Publishers
3	C. R. Basu	Business Organization and Management	1998	Tata McGraw Hill
4	Henry C. Lucas,Jr	Information Technology for Management	latest edition	Tata McGraw Hill
5	S.S. Dubey	IT Services Business Management: Concepts, Processes and Practices	latest edition	PHI Publication

MOOCs:

ResourcesNo.	Web site address
1	NPTEL
2	Swayam
3	www.edx.com
4	www.coursera.com

Programme: BCA CBCS – Revised Syllabus w.e.f. - Year 2022 – 2023			
Semester	Course Code	Course Title	
I	105	Discrete Mathematics	
Type	Credits	Evaluation	Marks
Skill Enhancement Course	3	IE& UA	100
Course Objectives :			
<p>To make students to :</p> <ul style="list-style-type: none"> • Get familiar with discrete structures of mathematics and its application in Business model the given data in set structure • Define the function and identify the types of function • Set relation among data descriptors • Represent the facts in logic statements and resolve the given problem 			

Course Outcomes:				
<p>After completing the course the students shall be able to :</p> <ul style="list-style-type: none"> • Write an argument using logical notation and determine if the argument is valid or not • Understand the basic principles of sets and operations in sets • Identify the function type and define a function • Demonstrate the relations and functions to determine their properties • Model the given facts in logic statement 				
Unit	Sub Unit	Competency	Competency Indicators	Sessions
Set Theory	Definition of a set, Representation of elements of sets, Methods of representing sets, types of sets, operations on sets , cardinality of a set, Principle of Inclusion and Exclusion, Venn Diagram, Proof by using Venn diagram	Defining a set and its elements, finding length of set and performing various operations on sets,	Representing problem information using sets and Venn diagram and find the solution for the problem	6
Functions and Relations	Definition of Function, Types of Functions ,Composite Function, Relation definition, representation of relations	Defining function as a process and define domain and co-domain accordingly	Convert a process to mathematical expression to a function or a relation	6

Logic	<p>Propositions, Logic Operations-Negation, Disjunction, Conjunction, Conditional and Biconditional, Truth Tables of compound propositions, Translating English sentences into logical statements and vice versa, Logic gates and circuits</p>	Different logic connectors, creating truth tables for compound propositions	Expressing a problem as a set of logical statements.	8
Matrices	<p>Matrix Definition, General Form, Representation of matrix in computers, Types of matrices, Operations on matrices: Addition, Subtraction and Multiplication, transpose , row / column transformations , Inverse of the matrix by Co-factor and Adjoint method, solutions to three variable problems by using matrices, application problems of matrices</p>	Defining and representing data in the form of matrix and processing it as an unit.	Applying matrices for finding solution to multivariate problem.	8
Permutations, Combinations and Probability	<p>Concept- Permutation, Combination, Sum and Product rules, problems on Permutation and combination (with wording atleast, atmost, neither nor, any one etc.)</p> <p>Concept and problem solving, general probability, conditional probability, partitions, Bayes Theorem</p>	Counting possible number of outcomes for given experiment and calculating chance of occurrence of a desired event.	Applying probability concept to solve real life situations.	10

Reference Books:

Sr. No.	Name of the Author	Title of the Book	Year Edition	Publisher Company
1	Kenneth Rosen	Discrete Mathematics & its Applications, 6 th Edition	2007	Tata Mc Graw Hill

2	Semyour Lipschutz & Marc Lipson	Discrete Mathematics, 2 nd Edition	Reprint 2010	Tata Mc Graw Hill

MOOCs:

ResourcesNo.	Web site address
1	NPTEL / Swayam www.coursera.com www.edx.com

Programme:BCA CBCS – Revised Syllabus w.e.f. - Year 2022 – 2023			
Semester	Course Code	Course Title	
I	106	Lab on MS-Office Suite and C Programming	
Type	Credits	Evaluation	Marks
Core Disciplinary Course	3	IE& UA	100
Course Objectives :			
To acquaint students with fundamentals of Business Organization and management systems as abody of knowledge.			

Course Outcomes:				
<ul style="list-style-type: none"> • Develop skills to write simple programming concepts using C language • Implement a real world problem using basic constructs of C language • Develop an application using Decision making and looping And Make use of proper operators to solve problem • Make use of Arrays and pointers efficiently and handling strings. • Comprehend the dynamic memory allocation and pointers in C. • Able to define new data types using enum, structures and typedef 				
Unit	Sub Unit	Competency	Competency Indicators	Sessions
Information Technology Essentials, Windows and Internet Explorer:	Verify the components of a typical computer system, Explore, maintain files, andcustomize the Windows operating system, Review using the Internet Explorer.	Understanding computer system and customising operating system	Identify various components of computer navigating through various options of operating system and customising it	
MS Word	Introduction to MS Word, Menus, Shortcuts, Document typesWorking with Documents: a) Opening Files, Formatting page and Setting Margins, Converting files to different formats, Editing text documents, Using Toolbars,	understanding Word software Working with documents and its settings Formatting creating table	word document preparation with proper formatting for given theme repairing time tables syllabus Structure using table	

	<p>Ruler, Icons and help</p> <p>b) Formatting Documents: Setting Font Styles, Setting Paragraph style, Setting Page Style, Setting Document Styles</p> <p>c) Creating Tables: Table settings, Borders, Alignments, insertion, deletion, Merging, Splitting, Sorting, Formula</p> <p>d) Drawing: Inserting Pictures/Files etc., Drawing Pictures, Formatting & Editing pictures, Grouping and ordering, Rotating</p> <p>e) Tools: Word Completion, Spell Checks, Macros, Mail merge, Templates, Using Wizards, Tracking, Changes, Security</p>	<p>in tabular data drawing objects pictures use mail merge</p>	<p>Preparing Word document with graphical objects sending later reset to recipient using mail merge</p>	
MS Power Point	<p>a) Introduction: Opening new Presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts</p> <p>b) Creating a presentation: Setting presentation style, Adding Text to the presentation</p> <p>c) Formatting a presentation: Adding style, Color, gradient fills, Arranging objects, Adding Header & Footer, Slide background, Slide layout</p> <p>d) Adding Graphics to the presentation: Inserting pictures, movies, tables, etc into the presentation, Drawing Pictures using Draw</p> <p>e) Adding effects to the presentation: Setting Animation & transition effect, Adding audio and video Printing</p>	<p>Understanding creation of PowerPoint presentation</p>	<p>Preparing PowerPoint presentation for seminar topic yesterday presentation with animation</p> <p>Presenting a PowerPoint presentation of college department with proper graphics and effects</p>	

	Handouts and Generating standalone presentation viewer			
MS Excel	<p>a) Introduction:</p> <p>Spreadsheet & its Applications , Opening spreadsheet,</p> <p>Menus & Toolbars & icons, Shortcuts , Using help</p> <p>b) Working with Spreadsheets:</p> <p>Opening a File, Saving Files, Setting Margins, Converting files to different formats : Importing, Exporting and Sending files to others, Spreadsheet addressing, Entering and Editing Data:</p> <p>c) Computing data :</p> <p>Setting Formula, Finding total in a column or row, Mathematical Operations(Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formula</p> <p>d) Formatting Spreadsheets:</p> <p>Formatting – Cell, row, column Headers, Row Height, Column Width,</p> <p>Visibility – Row, Column, Sheet, worksheet Security</p> <p>e) Formatting – worksheet:</p> <p>Sheet Formatting & style - background, color, Borders & shading, Anchoring objects, Formatting layout for Graphics, Clipart etc.,</p> <p>f) Working with sheets :</p> <p>Sorting, Filtering, Validation, Consolidation, Subtotal , Creating Charts, Selecting charts, Formatting charts, label, scaling etc.,</p>	Working with Excel sheet, Spread sheet	<p>Representing Excel sheet preparation for business application</p> <p>Visualisation of Excel data</p>	

	<p>g) Using Tools:</p> <p>Error Checking, Spell Checks, Macros, Formula Auditing, Creating & using</p> <p>Templates, Tracking changes, customization, printing worksheet</p>			
Working with Excel Functions	<p>Concept of Functions, Commonly used functions: Sum, Max, Min, Average, Count, Today, Now, Datedif, Countif, CountA, CountBlank, Round, RoundUp, RoundDown,</p> <p>ABS, Sign, Ceiling, Floor, Trim, Value, Clean, sqrt, if, sumif</p> <p>MS Access:</p> <p>What is an Access Database, Opening a Database File, Create Table, Create and modify fields of tables, Construct simple queries, Saving and Running Queries</p>	<p>Studying mathematical functions</p> <p>Understanding concept of database</p> <p>Studying how to write and use queries writing queries</p>	<p>applying mathematical functions for given Excel data</p> <p>Creating data bases studying how to write and use queries</p> <p>Writing queries for given database and problem</p>	
Operators	<p>Compilation and Executing programs Arithmetic operations</p> <p>Use of Symbolic constants</p> <p>Demonstrating the following gcc options -o, -c, -D, -l, -I, -g, -E Programs to demonstrate use of operators and Input/output</p> <p><i>gcc or an equivalent compiler is assumed.</i></p> <p>Compilation and Executing programs Arithmetic operations</p>	<p>Understanding of how to write program using input output statement and its execution</p>	<p>program writing using scanf print statements to perform various operations for given problem</p>	10
Selection & Iteration Construct	<p>Program to demonstrate the following</p> <ul style="list-style-type: none"> - Branching <ul style="list-style-type: none"> - Nested Branching - Looping <p>Selection.</p>	<p>use of branching looping statements in programming</p>	<p>writing programs using if else switch case looks statement based on the problem requirement</p>	10

Function and Storage Classes	<p>Working with functions</p> <ul style="list-style-type: none"> - Writing function prototype and definition - Using functions to solve problems (Calling a function) - Using recursion <p>Storage classes - Using register, extern and static</p>	Understanding of how to write user defined functions and study where to use it and how to use it	program writing using function with its various variants to solve the given problem	10
Array & String	<p>Arrays and Strings</p> <p>1D - Linear Search, Binary Search, Bubble Sort, Selection Sort, Insertion Sort 2 D - Matrix operations</p> <p>Strings: program to do operations on string using library and user defined functions</p> <p>Finding length of string, String concatenation, removing extra spaces, get substring, checkwhether second string is part of another, converting string to lowercase, uppercase etc..</p>	study array its types various search and sort technique using array study of string and its manipulation	program writing for search technique sorting techniques Matrix manipulation using array writing programs for string manipulation	10
Structure Pointer	<p>Structures</p> <p>Making use of structures to define new types(user defined types) Arrays of structure, display all elements of array and sorting of them.</p> <p>Pointers,</p> <p>Programs to demonstrate working of pointer; need of pointer Pointer as parameter to function</p> <p>Comparison of pointer with arrays and using pointer to refer an array Creating pointer dynamically by using dynamic memory allocation</p> <p>Array of Pointers, Ragged Arrays, Function pointer.</p>	study user defined data types structure union and concept of pointer	program writing for processing of stored data based on the problem requirement program to implement efficient memory usage for given problems	5

Programme:BCA CBCS– RevisedSyllabusw.e.f.-Year2022 –2023			
Semester	Course Code	Course Title	
I	107	Universal Human Values	
Type	Credits	Evaluation	Marks
Value Addition course	1	IA	50
Course Objectives:			
<ul style="list-style-type: none"> To help the student to see the need for developing a holistic perspective of life. To sensitize the student about the scope of life – individual, family, society and nature/existence. Strengthening self-reflection. To develop more confidence and commitment to understand, learn and act accordingly. 			

Course Outcomes:				
<ul style="list-style-type: none"> Provide an overview of Prerequisites to Human Values Understand the role of a human being in ensuring harmony in self and society Actualize a harmonious environment wherever they work Analyse ethical dilemma while discharging duties in professional life. Evaluate ethical and unethical decisions and take a right stand Develop a harmonious environment for holistic development of self and body. 				
Unit	Sub Unit	Competency	Competency Indicators	Sessions
Introduction to Value Education & Harmony in Human Being	1. Value Education, Definition, Concept and Need for Value Education. 2. Self exploration as a means of Value Education. Harmony in the Human Being 1. Human Being is more than just the Body. 2. Harmony of the Self ('I') with the Body - happiness and physical facility 3. Understanding Myself as Co-existence of the Self and the Body. 4. Understanding Needs of the Self and the needs of the Body. 5. Understanding the activities in the Self and the activities in the Body.	Understanding the Students version of Harmony in Human Being	Understanding the past behavior and giving a new perspective and analyzing the change.	5

Harmony in the Family and Society and Harmony in the Nature	<ol style="list-style-type: none"> 1. Family as a basic unit of Human Interaction and Values in Relationships. 2. The Basics for Respect and today's Crisis: Affection, e, Guidance, Reverence, Glory, Gratitude, Prosperity and Love. 3. Comprehensive Human Goal: The Five Dimensions of Human Endeavour. 4. Harmony in Nature: The Four Orders in Nature. 5. The Holistic Perception of Harmony in Existence. 	Making the Students understand the terms through various examples and bringing in a holistic perception of Existence	Through case studies interpretation students should be made aware of the importance of these in self and for family and society.	5
Professional Ethics	<ol style="list-style-type: none"> 1. Value based Life and Profession. 2. Professional Ethics and Right Understanding. 3. Competence in Professional Ethics. 4. Issues in Professional Ethics – The Current Scenario. 	Understanding the role of ethics.	Through past evidences (historical scriptures) bringing in the role of ethics in right understanding.	5

ReferenceBooks:

Sr. No.	Name of the Author	Title ofthe Book	Year Edition	Publisher Company
1	Bertrand Russell	Human Society in Ethics & Politics	2015	Taylor and Francis
2	I.C. Sharma	Ethical Philosophy of India	1965	Johnsen

Online Resources:

Online Resources No.	Website address
1	https://fdp-si.aicte-india.org/verifiedProgramDetailsList.php
2	https://citizenchoice.in/course/Universal-Human-Values/Unit%201/Happiness-and-Prosperity

MOOCs:

ResourcesNo.	Website address
1	Swayam.gov.in
2	https://epgp.inflibnet.ac.in

Programme:BCA CBCS – Revised Syllabus w.e.f. - Year 2022 – 2023				
Semester	Course Code	Course Title		
I	108	Language-I		
Type	Credits	Evaluation	Marks	
Ability Enhancement	3	IE& UA	100	
Course Objectives :				
To make students to: <div><div></div><div>1. Participate actively in discussions & debates</div><div>2. Give impromptu speeches and prepared presentations</div><div>3. Read, comprehend and summarize articles</div><div>4. Learn typical formats for writing and practice writing skills</div><div>5. Prepare power-point presentations</div><div>6. Receive extensive feedback on their oral and written skills</div></div>				
Course Outcomes:				
After completing the course the students shall be able to <div><div></div><div>• Understand and read English better</div><div>• Write accurately and speak fluently.</div><div>• Participate actively in discussions and debates</div><div>• Give presentations.</div></div>				
Unit	Sub Unit	Competency	Competency Indicators	Sessions
1 Grammar and Translation	<div><div></div><div>• Construction of sentences with there is, there are, it is etc.</div><div>• Usage of articles, tenses and prepositions etc.</div><div>• Translation of sentences, & passages from mother tongue to English</div><div>• General errors in Sentence Constructions</div><div>• Synonyms, Antonymous, use of appropriate words</div><div>• Idioms & Phrases</div></div>	Formation of English sentences with use correct of English Grammar	Understand and apply grammar, Translating sentences, use of idioms and phrases	12
2 Reading, Listening,	<div><div></div><div>• Reading short passages aloud and discussion</div></div>	Fluent reading and comprehension of English passages	Pronouncing words, understanding of texts and	8

and Comprehension skills	<ul style="list-style-type: none"> • Listening of conversations and answering questions • Comprehension of Short Passages • Comprehensions of texts, judgments and other passages of more general nature 		answering questions thereon	
3 Speaking skills	<ul style="list-style-type: none"> • Introducing oneself • Conversations between two student on a given topic/role play • Impromptu speech on a given topics • Debates and Logical reasoning 	Use of English in self introduction, debates, logical reasoning and impromptu speech	Introducing oneself, participation in debates, logical reasoning and impromptu speech	8
4 Writing skills	<ul style="list-style-type: none"> • Writing correctly (Grammar, Punctuation) • Paragraph Writing • Letters – Structure & Layout (Business & Official letters) • Essay writing • Resume writing 	English writing	Paragraph, essay, letter, resume writing	10
5 Presentation Techniques	<ul style="list-style-type: none"> • Preparing PowerPoint presentations • Preparing for class-room presentations 	Giving English presentations	Making PowerPoint presentations, Giving presentation to class	7

Reference Books:

Sr. No.	Name of the Author	Title of the Book	Year Edition	Publisher Company
1	B.M. Sheridan	Speaking and Writing in English	2017	The Readers Paradise
2	Ellen Kaye		2002	Currency

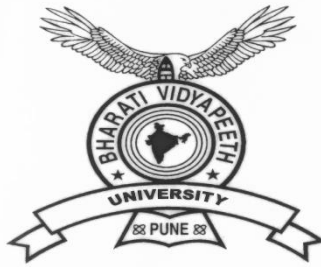
		Maximize Your Presentation Skills: How to Speak, Look, and Act on Your Way to the Top		
3	Thomson and Martinet	<i>A practical English Grammar</i>	1970	The English Language Book Society and Oxford University Press
4	Wren and Martin,	<i>English Grammar and Composition</i>	latest edition	S. Chand, Delhi
5	Mike Gould	<i>Cambridge Grammar and Writing Skills Learner's Book 8</i>	2019	Cambridge University Press

Online Resources:

Online Resources No.	Web site address
1	https://www.passporttoenglish.com
2	https://www.youtube.com/user/EnglishLessons4U
3	http://www.5minuteenglish.com/grammar.htm
4	https://learnenglish.britishcouncil.org/skills/writing/a1-writing
5	https://www.skillsyouneed.com/presentation-skills.html

MOOCs:

ResourcesNo.	Web site address
1	https://www.my-mooc.com/en/mooc/english-grammar-style-uqx-write101x-3/
2	https://www.my-mooc.com/en/mooc/business-english-making-presentations/
3	https://www.my-mooc.com/en/mooc/english-for-effective-business-speaking/
4	https://www.my-mooc.com/en/mooc/english-for-business-and-entrepreneurship/
5	https://www.my-mooc.com/en/mooc/english-doing-business-asia-writing-hkustx-eba102x-1/



BHARATI VIDYAPEETH

(Deemed to be University), Pune

**'A+' Accreditation (Third Cycle) by 'NAAC' in 2017
Category-I Deemed to be University Graded by UGC
'A' Grade University Status by MHRD Govt. of India**

Ranked 73rd by NIRF – 2022

FACULTY OF MANAGEMENT STUDIES

BACHELOR OF COMPUTER APPLICATION DEGREE

(THREE YEARS) / HONORS (FOUR YEARS)

FRAMED AS PER NATIONAL EDUCATION POLICY

(NEP 2020)

Semester II Syllabus

Applicable with effect from 2022-23

SEMESTER II

Course Number	Course Title	Course Type	Credits	Hours / Week			IA	UE	Total
				L	T	P			
201	Web Development Technology	DSC	3	3	1	-	40	60	100
202	DBMS I	DSC	3	3	1	-	40	60	100
203	Data Structures using C	DSC	3	3	1	-	40	60	100
204	Financial Accounting	MDC	3	3	1	-	40	60	100
205	Lab on Data Structures using C	DSC	2	-	-	4	40	60	100
206	Lab on Web Development Technology	DSC	2			4	40	60	100
207	Environmental Studies	VBC	2	2	-	-	50	-	50
208	Community Work (Swaccha Bharat Abhiyan)	VBC	2	2	-	-	50	-	50
Total			20	16	4	8	340	360	700

Exit option : Student who opt for exit option will be awarded with **Certificate** after successful completion of BCA-Sem-I and BCA-Sem-II and Bridge course internship project.

Programme:BCACBCS– RevisedSyllabusw.e.f.-Year2022 –2023			
Semester	CourseCode	CourseTitle	
II	201	Web Development Technology	
Type	Credits	Evaluation	Marks
Discipline Specific Course	3	IE(40) + UA(60)	100
Course Objectives:			
To make students to: <ul style="list-style-type: none"> To get proficiency in Website designing To learn Wordpress as Content Management System To get familiar to use all setting and components of Wordpress 			
Course Outcomes:			
After completing the course the students shall be able to <ul style="list-style-type: none"> Understand Wordpress as a Content Management System Design Website using Wordpress Apply Themes and Templates in Wordpress Implement Plugin in Website 			

Unit	Subunit	Competency	Competency Indicator	Sessions
Concept of Website	Elements of website - Domain ,Hosting , Content Management System (Wordpress), Domain – Registration , Manage DNS , Nameserver and Domain Forward Hosting – Understand the Difference in Shared Hosting , Cloud Hosting and VPS Hosting WordPress - Installation of WordPress , MySQL Secuirty Certificate – Understand the use of SSL using Free and Paid Service Providers	Understand design and working of simple basic website	Apply the various components required to build website	9
Website Configuration	Header and Footer Configuration General Configuration – Font / Forecolor / Button Type / Backcolor Site Configuration – Logo , Site Icon , Site Name Home page Setting , Website layout Setting	Understand layout and components on website	Create the site configuration and layout	9

Admin Panel Understanding	Change Settings- General Writing Reading, Discussion, media, permalinks and privacy Import and Export website data Add / modify Themes Install – Activate Plugin	Evaluate admin panel	Study and apply different settings using admin panel.	9
WordPress Themes And Working with Content	Basics of Themes, Downloading, installing, and activating themes, Installing themes from Dashboard WordPress Plugin: Basics of Plugin, Downloading, installing, and activating free and Paid Plugin WordPress Templates: Basics of Templates, Downloading, installing, and activating Templates, Design Pages using Template Posts Vs Pages, Adding Hyperlinks, Playing with Media content, Previewing and Editing Posts, Previewing and Editing Pages, Page Order, Creating a post, Adding Media files to content –images and videos, Using Categories and Tags, Creating Pages, Page Hierarchy	Apply Plugin and template for designing web page	Implement plugin and template using dashboard	10
Case Study – Online Sales Website	Design Page using Elementor plugin Demonstrate the use of WooCommerce plugin Add WhatsApp Chat button to website for communication Integrate Shipping solution to website using (shiprocket / instashipin) plugin Integrate Payment gateway to website using (payu / razorpay) plugin	Design online sales website	Apply appropriate option to create a online Sales website	8

References Books

Sr. No	Name of the Author	Title of the Book	Year	Publisher Company
1	Lisa Sabin - Wilson	Wordpress Web Design for Dummies	2015	For Dummies
2	Lisa Sabin- Wilson	Wordpress All in One for Dummies	2017	John Wiley & Sons
3	Sayyed Majid	Wordpress Web Development: Basic to Advance	2021	Code Academy, Aurangabad
4	Joseph Joyner	Wordpress For Beginners: How to	2015	MihailsKonoplo vs

		Create and Set Up Your Own Website or Blog Using Wordpress		
5	Dr.Ritesh Kumar	Learn WordPress in Easy Way	2019	Ganpati Book Centre

Online Resources

Online Resource No.	Website Address
1	https://www.tutorialspoint.com/wordpress
2	https://www.javatpoint.com/wordpress-tutorial
3	https://www.w3schools.in/wordpress

MOOC

Resource No.	Website Address
1	NPTEL
2	Swayam
3	edx.com
4	coursera.com

Programme:BCACBCS– RevisedSyllabusw.e.f.-Year2022 –2023			
Semester	Course Code	CourseTitle	
II	202	DBMS - I	
Type	Credits	Evaluation	Marks
Discipline Specific Course	3	IE(40) + UA(60)	100
Course Objectives:			
To make students to: <ul style="list-style-type: none"> • Get familiar with basic concepts of DBMS. • To impart knowledge of the concepts related to database and operations on databases. • To manage database in various environments with emphasis on security measures and concurrency. 			
Course Outcomes:			
After completing the course the students shall be able to <ul style="list-style-type: none"> • Understand the basic concepts of DBMS. • Design the database by applying data model like Entity relational model. • Applying the keys and normalization while designing the database. • Understand the concept of transaction and its operations. 			

Unit	Sub Unit	Competency	Competency Indicators	Sessions
Introduction of Database Management System	Basic Concepts of DBMS (Data Vs. Information), Data Processing, Definition of DBMS, Characteristic of Database Database architecture: Levels of Abstraction, Database schema and instances 3 tier architecture of DBMS Data Independence, Database users, Types of Database System.	Concept of basic terminologies and database architecture	Understand the basic terminologies of DBMS and its architecture	8
Data Modeling	Logical Data Modeling: Hierarchical Data Model, Network Data Model, Relational Data Model. Conceptual Data Modeling: Entity Relationship Model, Entities, Attributes, Types of Attributes, Relationships, Relationship set, Degree of relationship Set, Mapping Cardinalities, ER Diagram	Apply concepts of Data Modeling to design database	Understand the different types of Models and its implementation	8

	<p>Notations</p> <p>Roles Participation: Total and Partial, Strong and Weak Entity Set.</p>			
Normalization	<p>Codd's Rules for RDBMS</p> <p>Keys: Primary key, Foreign key, Candidate key, Super key, Unique key. Simple Key, Composite key</p> <p>Normalization: Concept of normalization, Decomposition, Lossy and Lossless Decomposition, Functional Dependencies. Normal Form: First NF, Second NF, Third NF, Case Studies on Normalization</p>	Standardise the relational database in terms of keys and normalization	Normalize the database schema up to 3 rd normal form.	11
Introduction to Database Languages and Basic concepts of SQL	<p>Database Languages: Introduction of SQL, features, SQL data types.</p> <p>DDL commands: create table, describe table, alter table, and drop table commands.</p> <p>DML Commands: insert, delete, update command</p> <p>DQL commands: All select commands, and order by clause.</p>	Different statements in database language w.r.t. SQL.	Construct basic queries using SQL	8
Transaction management and Concurrency control	<p>Transaction management: Definition of transaction, State of Transaction, ACID properties, Schedules, Serializability of schedules</p> <p>Concurrency control: Lock based concurrency control (2PL), Strict 2PL, Time stamping method.</p> <p>Deadlock and its handling: Definition, Wait-Die and Wound-Wait methods.</p> <p>Database Recovery: Log Based Recovery, Check points, Shadow Paging</p>	Understand concept of transaction and concurrency control.	Learn basics of transaction processing and concurrency control	10

ReferenceBooks:

Sr.No.	NameoftheAuthor	Title ofthe Book	Year	PublisherCompa ny
1	RamezElmasri, S.Navathe	Fundamentals of Database Systems	6th Edition 2010	Pearson Education
2	ASilberschatz, H Korth, S Sudarshan	Database System and Concepts	6th Edition 2010	McGraw-Hill.
3	C.J.Date	An Introduction to Database Systems	3 rd Edition 2006	Addison Wesley

Online Resources:

OnlineResourcesNo.	Websiteaddress
1	https://www.udemy.com/course/database-management-system/
2	https://www.youtube.com/watch?v=cMUQznvYZ6w
3	https://www.youtube.com/watch?v=3EJlovevfcA
4	https://www.youtube.com/watch?v=T7AxM7Vqvaw

MOOCs:

ResourcesNo.	Websiteaddress
1	https://www.classcentral.com/course/swayam-data-base-management-system-9914
2	https://www.classcentral.com/course/youtube-dbms-database-management-system-95181
3	https://www.classcentral.com/course/swayam-introduction-to-database-systems-17660

Programme:BCACBCS– RevisedSyllabusw.e.f.-Year 2022–2023			
Semester	Course Code	CourseTitle	
II	203	Data Structures using C	
Type	Credits	Evaluation	Marks
Discipline Specific Course	3	IE(40)&UA(60)	100
Course Objectives:			
<ul style="list-style-type: none"> To provide the knowledge of basic data structures and their implementations. To evaluatesignificance of data structures in context of writing efficient programs. To develop skills to apply appropriate data structures in problem solving. To acquire proficiency in file handling in C. 			
Course Outcomes:			
<p>After completing the course the students shall be able to</p> <ul style="list-style-type: none"> Learn the basic types for data structure, implementation and application. Know the strength and weakness of different data structures. Use the appropriate data structure in context of solution of given problem. Develop programming skills which require to solve given problem. 			

Unit	Sub Unit	Competency	Competency Indicators	Sessions
Introduction to data structure	<ul style="list-style-type: none"> Data type Abstract Data Type (ADT) Type of data structure Array as a data structure Sorting techniques with time complexity: Bubble sort, Selection sort, Insertion sort and Quick sort Searching techniques with time complexity: Linear search and Binary search 	<p>Understanding of data structure concept</p> <p>Apply array as data structure</p> <p>Learning different sorting and searching techniques.</p>	<p>Application of data structure in real life.</p> <p>Implementatio n of sorting and searching techniques</p>	10
Linked List	<ul style="list-style-type: none"> Definition Memory representation of linked list Types of Linked List-singly, doubly and circular Basic Operations of 	<p>Understand concept of Linked list, its types, basic operations and applications</p>	<p>Study the types of linked list and application</p> <p>Implementatio n of linked list operations</p>	10

	linked list • Applications of linked list			
Stack and Queue	Stack: <ul style="list-style-type: none"> • Definition • Stack operations • Array implementation of stack • Linked list implementation of stack • Applications of stack Queue: <ul style="list-style-type: none"> • Definition • Queue operations • Array implementation of queue • Linked list implementation of queue • Applications of queue 	Understand concept of stack and queue with its operations and applications	Study the detailed concept of stack and queue Implementation of stack and queue using array and linked list	12
Trees	<ul style="list-style-type: none"> • Concept of tree • Tree terminologies • Binary Tree • Types of binary tree • Tree traversal- Preorder, Inorder and Postorder 	Define tree and various tree terminologies Learn binary tree with its types and traversal methods	Understanding of tree concept Implementation of tree data structure using C Programming	7
File Handling	<ul style="list-style-type: none"> • Concept of file • Types of File • Operations on file • File modes • file management functions-fopen(), fclose(), fprintf (), fscanf(), getc(), putc (), getw(), putw () • Random access functions-fseek(), ftell() and rewind() 	Know concept of file with its types, operations and modes Introduction of file management functions	Apply files processing using C Language	6

Reference Books:

Sr.No.	Name of the Author	Title of the Book	Year Edition	Publisher Company
1	Yashavant Kanetkar	Data Structures Through C	2009 Second	BPB Publications
2	Reema Thareja	Programming in C	2011 First	Oxford University Press
3	Aaron Tenenbaum	Data Structures using C and C++	Second Edition	Pearson Education
4	Rajani Jindal	Data Structures using C	2006	Umesh Publication

Online Resources:

Online Resources No.	Website address
1	https://www.mygreatlearning.com/blog/data-structures-using-c/
2	https://www.edureka.co/blog/c-data-structures/
3	https://www.programiz.com/dsa

MOOCs:

Resources No.	Website address
1	NPTEL/Swayam
2	www.edx.com
3	www.coursera.com

Programme:BCACBCS– RevisedSyllabusw.e.f.-Year2022 –2023			
Semester	Course Code	CourseTitle	
II	204	Financial Accounting	
Type	Credits	Evaluation	Marks
Minor Disciplinary Course	3	IE 40 + UA(60)	100
Course Objectives:			
<ul style="list-style-type: none"> To get familiar with basics of accounting concepts. To learn journal entries and prepare financial statements To get acquainted with computerised accounting system 			
Course Outcomes:			
<p>After completing the course, the students shall be able to</p> <ul style="list-style-type: none"> Remember the basic numerical operations and pass book entries. Understand the basics of financial accounting and accounting principles Apply the rules of journal entries for preparing journals, ledgers and trial balance. Analyse the trial balance and transferring the accounts to respective financial statements. Evaluate the adjustments and applying its effect on respective accounts. Generate the logic for implementing accounting procedure in the accounting software. 			

Unit	Sub Unit	Competency	Competency Indicators	Sessions
Introduction to Financial Accounting, Accounting Principles, Concepts and Conventions	<p>Need for Accounting, Meaning and definition of book keeping, System of Book keeping. Financial Accounting- definition, Scope and objectives, Financial Accounting v/s Book Keeping, Limitations of Financial Accounting. End users of financial statements.</p> <p>Accounting principles- Accounting Concepts and Conventions , , Branches of accounting , concept of bad debts , depreciation ,methods of depreciation :Fixed and reducing, Examples on depreciation</p>	Have a basic understanding of need of financial accounting and how accounting works.	Understand and remembering system of book keeping and Financial accounting and ability to apply the concepts and principles	12
Journal and ledger:	Journal-importance and utility, classification of accounts, journalizing of transactions. Ledger- meaning and utility, posting of journal entries to the ledgers ,closing the ledger	Know the types of account and rules of journal entries	Classifying the account and then making appropriate debiting and	10

	accounts, Examples on journal entries of transactions and posting them to ledgers, closing ledger accounts .		crediting respective account	
Subsidiary Books And Trial Balance	Simple Cash book, Cash Book with two columns, Cashbook with three columns, Petty Cash Book , Purchase book, Sales book, Purchase Return book , Sales return book . Trial Balance - meaning and purpose, Preparation of Trial Balance from ledger accounts .	Understand the procedure of preparing appropriate subsidiary books	Preparation of subsidiary books and posting the relevant items	06
Final account of Sole Proprietorship	Meaning of final account, Need to prepare final account , Uses of Final account , Preparation of Final account of Sole Proprietorship : Trading and Profit, Loss Account and Balance Sheet of sole proprietary business with given adjustments.	Understand preparation of trading, profit and loss account and balance sheets	Preparing trading, profit and loss account and balance sheets and tallying the statements	12
Introduction to Accounting Packages	Need of accounting software, features of accounting packages , introduction to Tally package, various books maintained in Tally accounting package, atomized effect of one transaction in various books of accounting through accounting package.	Knowing the use of computers in automation of accounting procedure and updating entire accounting statements with single transaction	Developing logic for accounting packages	05

ReferenceBooks:

Sr. No.	NameoftheAuthor	Title ofthe Book	YearEdi tion	Publisher Company
1	Dr. S. N. Maheshwari	Financial Accounting For Management	2012	Vikas Publishing House
2	Robert Anthony, David Hawkins	Business Accounting	2009	Tata McGraw–Hill
3	M.G.Patkar	Book-Keeping & Accountancy	2006	FYJC Commerce
4	Anil Chowdhary	Fundamentals of Accounting & Financial Analysis	2007	Pearson Education

MOOC's:

Sr.No.	Websiteaddress
1	https://in.coursera.org/courses?query=accounting

Programme:BCACBCS– RevisedSyllabusw.e.f.-Year2022 –2023			
Semester	Course Code	CourseTitle	
II	205	Lab on Data structures using C	
Type	Credits	Evaluation	Marks
Discipline Specific Course	2	IE 40 + UA(60)	100
Course Objectives:			
<ul style="list-style-type: none"> To provide the knowledge of basic data structures and their implementations. To evaluate significance of data structures in context of writing efficient programs. To develop skills to apply appropriate data structures in problem solving. To acquire proficiency in file handling in C 			
Course Outcomes:			
<p>After completing the course, the students shall be able to</p> <ul style="list-style-type: none"> Learn the basic types for data structure, implementation and application. Know the strength and weakness of different data structures. Use the appropriate data structure in context of solution of given problem.. Develop programming skills which require to solve given problem. 			

Unit	Sub Unit	Competency	Competency Indicators	Sessions
Introduction to data structure	<p>Write C programs for the following operations on Array. (i) Creation (ii) insertion (iii) deletion (iv) traversal</p> <p>Write C programs for implementing the following searching techniques. 1) Linear search 2) Binary search</p> <p>Write C programs for implementing the following sorting techniques to arrange a list of integers in ascending order. 1) Bubble sort 2) Insertion sort 3) Selection sort</p>	Learn the concept of array as data structure, searching and sorting techniques with explanation of algorithms to implement it using C code.	<p>Able to design and implement array operations using C code.</p> <p>Able to implement sorting and searching techniques using Array</p>	7
Linked List	<p>Write a C program for the following operations on Singly Linked List. 1) Creation 2) insertion 3) deletion 4) traversal 5) Searching</p> <p>Write a C program to count number of items present in a singly linked list.</p> <p>Write a C program for the following operations on Doubly Linked List.</p>	Discussion of algorithms to implement the concept of linked list and its operations with C code.	Can write programs using C code to demonstrate linked list concept with its operations.	7

	1) Creation 2) insertion 3) deletion 4) traversal 5) Searching			
Stack and Queue	<p>Write a C program to implement stack using array.</p> <p>Write a C program to implement stack using linked list.</p> <p>Write a C program that convert infix expression into postfix form.</p> <p>Write a C program to convert decimal to binary using stack.</p> <p>Write a C program to check whether a string is a Palindrome or not using stack.</p> <p>Write a C program to convert an infix expression into prefix format.</p> <p>Write a C program to implement queue using array.</p> <p>Write a C program to implement queue using linked list.</p>	Designing of algorithms to implement the concept of stack and queue using array and linked with C programming.	Able to write C code to implement stack and queue data structure using array and linked list.	7
Trees	<p>Write C program to demonstrate concept of tree.</p> <p>Write a C program to count number of leaf nodes and total number of nodes in a tree.</p>	Understand the concept of trees as non-linear data structure with explanation of algorithms to implement it using C code.	Can explain tree concept and able to write C code to demonstrate working of trees	4
File Handling	<p>Write C programs to implement working of following file management functions: fprintf (), fscanf(), getc(), putc (), getw(), putw ()</p> <p>Write C programs to implement working of following Random access functions: fseek(), ftell() and rewind()</p> <p>Write a C program to display contents of a file in uppercase and lowercase</p>	<p>Learn the working of file handling concept and discussion of file management function.</p> <p>Providing knowledge of how to write C</p>	Able to implement file management functions and random access functions using C programming.	5

	letters. Write a C program to count characters, spaces, tabs and new lines in a file. Write a C program to copy the contents of one file to another file. Write a C program to receive strings from keyboard and write them to a file. Write a program to read strings from a file and display them on screen.	programs to implement file management functions.		
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ReferenceBooks:

Sr. No.	NameoftheAuthor	Title ofthe Book	YearEdition	Publisher Company
1	YashavantKanetkar	Data Structures Through C	2009 Second	BPB Publications
2	ReemaThareja	Programming in C	2011 First	Oxford University Press
3	Aaron Tenanbaum	Data Structures using C and C++	Second Edition	Pearson Education
4	Rajani Jindal	Data Structures using C	2006	Umesh Publication

Online Resources:

OnlineResourcesNo.	Websiteaddress
1	https://www.mygreatlearning.com/blog/data-structures-using-c/
2	https://www.edureka.co/blog/c-data-structures/
3	https://www.programiz.com/dsa

MOOCs:

ResourcesNo.	Websiteaddress
1	NPTEL / Swayam
2	www.edx.com
3	www.coursera.com

Note: The practical examination need to be build on similar questions listed in detail syllabus

Semester	Course Code	CourseTitle	
II	206	Lab on Web Development Technology	
Type	Credits	Evaluation	Marks
Discipline Specific Course	2	IE(40) + UA(60)	100
Course Objectives:			
To make students to: <ul style="list-style-type: none"> Get aware about the applications of Wordpress as Content Management System Get knowledge about all setting and components of Wordpress 			
Course Outcomes:			
After completing the course the students shall be able to <ul style="list-style-type: none"> To operate Wordpress as a Content Management System To design Website using Wordpress To apply Themes and Templates in Wordpress To implement Plugin in Website development 			

Unit	Sub Unit	Competency	Competency Indicators	Sessions
Concept of Website	Domain Hosting Content Management System (Wordpress), Domain – Registration , Manage DNS , Nameserver WordPress - Installation of WordPress	Apply design and working of simple basic website	Create website with the various components needed to build website	5
Website Configuration	Header and Footer Configuration General Configuration – Site Configuration – Logo , Site Icon , Site Name Home page Setting , Website layout Setting	Understand layout and components on website	Analyze the site configuration and layout	6
Admin Panel Understanding	General Writing Reading ,Discussion , media, permalinks and privacy data Themes Activate Plugin	Understand admin panel with different setting	Apply different setting using admin panel.	6
WordPress Themes And Working with Content	Themes, Downloading, installing, and activating themes, WordPress Plugin:	Understand Plugin and template for designing web page	Apply plugin and template using dashboard	7

	<p>Downloading, installing, and activating</p> <p>Templates Downloading, installing, and activating Templates, Design Pages using Template</p> <p>Adding Hyperlinks, Playing with Media content, Previewing and Editing Pages, Page Order, Creating a post, Adding Media files to content</p>			
Case Study – Online Sales Website	<p>Demonstrate the use of WooCommerce plugin</p> <p>Add WhatsApp Chat button to website for communication</p> <p>Integrate Shipping solution to website</p> <p>Integrate Payment gateway to website</p>	Understand and prepare design online sales website	Apply appropriate option to create a online Sales website	6

ReferencesBooks

Sr. No	Name of the Author	Title of the Book	Year	Publisher Company
1	Lisa Sabin - Wilson	Wordpress Web Design for Dummies	2015	For Dummies
2	Lisa Sabin- Wilson	Wordpress All in One for Dummies	2017	John Wiley & Sons
3	Sayyed Majid	Wordpress Web Development:Basic to Advance	2021	Code Academy, Aurangabad
4	Joseph Joyner	WordpressFor Beginners: How to Create and Set Up Your Own Website or Blog Using Wordpress	2015	MihailsKonoplovs
5	Dr.Ritesh Kumar	Learn WordPress in Easy Way	2019	Ganpati Book Centre

Online Resources

Online Resource No.	Website Address
1	https://www.tutorialspoint.com/wordpress
2	https://www.javatpoint.com/wordpress-tutorial
3	https://www.w3schools.in/wordpress

MOOC

Resource No.	Website Address
1	NPTEL
2	Swayam
3	edx.com
4	coursera.com

Note: The practical examination need to be build on similar questions listed in detail syllabus

Programme:BCACBCS– RevisedSyllabusw.e.f.-Year2022 –2023			
Semester	CourseCode	CourseTitle	
II	207	Environmental Studies	
Type	Credits	Evaluation	Marks
Value Based Course	2	IE(50)	50
Course Objectives:			
<ul style="list-style-type: none"> To Understand the nature and function of the natural environment affecting society. 			
Course Outcomes:			
<ul style="list-style-type: none"> Understand the importance of Environment in the life of living things. Apply the awareness knowledge in taking eco-friendly actions in society. Judge what is right and wrong for the environment in day to day life. Analyse the impact of activities on environment and its effect. Understand the need and way of sustainable development and will pass the knowledge to the next generation. 			

Unit	Subunit	Competency	Competency Indicator	Sessions
The multidisciplinary nature of environment studies	<p>Definition, scope and importance-need of public awareness.</p> <p>Natural Resources:</p> <p>Renewable and non-renewable resources:</p> <p>Forest resources: Use and over-exploitation, deforestation. Case studies. Timber extraction, mining, dams and their effects on forest and tribal people.</p> <p>Water resources: Use and over-utilization of surface and groundwater, floods, droughts, conflicts over water, dams-benefit and Problems.</p> <p>Mineral resources: Use and exploitation 'environmental effects of extracting and using mineral resources, case studies.</p> <p>Food resources: World food problems, changes caused by agriculture. Fertilizer- pesticide problems, water logging, salinity, case studies.</p> <p>Energy resources: Growing energy needs, renewable and non-renewable energy resources, use of alternative energy sources.</p> <p>Land resources: Land as resources, land degradation, man induced landslides,</p>	<p>Understand the multidisciplinary nature of Environment.</p> <p>Understand the various renewable and non-renewable resources in nature.</p>	<p>Observations through field work on resources and understand the Sources, Utility, Problems and solutions for the resources.</p>	10

	desertification. Role of individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles			
Ecosystem	Concept of ecosystem, structure and function of an ecosystem, producers, consumers and decomposers .Energy flow in the ecosystem, Ecological succession, food chains, food webs and ecological pyramids, introduction, types, characteristics features structure and function of the following ecosystem, forest ecosystem ,grassland ecosystem, Desert ecosystem, Aquatic ecosystems, ponds, stream, lakes, rivers, estuaries	Understand the meaning, types and importance of ecosystem.	Visits to ecosystem and observe the role of producer, consumer and decomposer in the environment.	8
Biodiversity and its conservations	Introduction, Definition: genetic, species and ecosystem diversity, Biogeographically classification of India, value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option vales, India as a mega diversity nation, Hot-Spots of biodiversity, Threats to biodiversity: habitat loss, poaching of wildlife, Man wildlife conflicts, Endangered and endemic species of India, Conservation of biodiversity: In situ and Ex-situ conservation of biodiversity.	Understand the biodiversity in nature, its importance, threats of biodiversity and ways to conserve the biodiversity	Visit to biodiversity spots. Understand the biodiversity and their interrelationship. To adopt and implementation and new ways to conserve biodiversity.	6
Role for Environment Conservation	<ul style="list-style-type: none"> • Social issues and environment - Unsustainable to sustainable • Role of IT in Environment and human health.- Human population issue. • E-waste – Impact and remedies • Climate Change- Green House gases effect • Project work- Each candidate has to go for field visit and complete a project work on Environmental 	Understand the need and ways of unsustainable to sustainable development	Field work, Visit and Project report based on Environmental issues in society	6

	issues in society			
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ReferencesBooks:

Sr. No	Name of the Author	Title of the Book	Publisher Company
1	BharuchaErach	The Biodiversity of India	Mapin Publishing Pvt. Ltd.
2	Agrawal K.C	Environmental Biology	Nidhi PublishersLtd(2001)
3	Jadhav H and Bhosale V.M.	Environmental Protection and Laws	Himalaya PublishingHouse.
4	Miller T.G. Jr.	Environmental Science	Wadsworth Publishing Co.

MOOC

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1	NPTEL
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3	edx.com
4	coursera.com

Programme:BCACBCS– RevisedSyllabusw.e.f.-Year2022 –2023			
Semester	CourseCode	CourseTitle	
II	208	CommunityWork –SwacchBharatAbhiyan	
Type	Credits	Evaluation	Marks
Value Based Course	2	IE(50)	50
Course Objectives:			
<ul style="list-style-type: none"> ThiscourseaimstoexposethestudentstoSwacchBharatAbhiyaninitiativeofthegovernment 			
Course Outcomes:			
<ul style="list-style-type: none"> StudentswillbeabletounderstandthedetailsabouttheSwacchBharatAbhiyananditsimpactonsociety. 			

Unit	Subunit	Competency	Competency Indicator	Sessions
1.Swacch Bharat Abhiyan	Swacch Bharat Abhiyan : History,meaning, Roots of Swacch Bharat Abhiyan, Goals ofCleanlinessinitiatives.	Understand the basics of SBM	Change in Students Behaviour towards cleanliness habits	8
2. Cleanliness	InitiatorsofcleanlinessdriveinIndia.S antGhadageBaba,MahatmaGandhi,E ffortstakentowards theSwachBharat Abhiyan, SwachhBharatMission, Role of NGO's in Cleanliness	Study different cleanliness drives	Enhancement in Social Awareness	6
3. Impact of Cleanliness	ImpactofCleanlinessinitiatives and sanitation awareness.SocialAwareness,CaseStudies- COVID-19, SwachhToycathon Initiative,Mumbai Municipality Slum Sanitation ProgramIndia.	Study and analyse different cases	Strategic development in activities needed for Cleanliness initiatives	6
4. Community Hours	<p>Internshipof15days(100 hours)tobeundertaken</p> <p>Submitareporton aparticulartypeof communityinvolvementundertaken</p> <p>Topics may be related to:</p> <p>Sanitation, Waste Management, Digital Innovations, Green Practices, Involvement in Public Infrastructure Cleanliness, Animations, Videos creating awareness about Swacch Bharat,</p>	Study, Contribute in cleanliness activities and prepare case study report	Students community involvement	10

	Designing innovative SwachhToycathon toy/game etc.			
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References Websites:

1.	www.swachhbharaturban.in/
2.	https://en.wikipedia.org/wiki/Municipal_solid_waste
3.	https://swachhbharatmission.gov.in/sbmcms/index.htm
4.	https://innovateindia.mygov.in/swachh-toycathon/
5.	https://www.susana.org/resources/documents/default/2-1925-india-draft--en-susana-cs-india-mumbai-slumsanitationprogram-2010doc-anlage.pdf

MOOC

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4	coursera.com

Bridge Course :

The student who opt for Exit Option after FirstYear completion of BCA should complete the 50 days bridge course internship project in the form of Computerised application to the real life problem at industries. It is mandatory for the students to seek written approval from the faculty guide about the selection of topic and organisation before commencing the internship. The selection of the problem should be based on theoretical knowledge he/she gain in BCA-Sem-I and BCA-Sem-II. Student should submit application regarding permission to exit BCA programme at least four months before the completion of First Year of BCA Programme. This bridge course will help the student to absorb job opportunities in the IT field.

General chapterization of the report shall be as under:

- 1) Introduction
- 2) Theoretical background
- 3) Company profile
- 4) Objectives of the study
- 5) System Requirements
- 6) System Analysis & Design
- 7) Implementation & Testing
- 8) Conclusion & Suggestions

References:

Annexure: -

TECHNICAL DETAILS:

1. The report shall be printed on A-4 size white bond paper.
2. 12 pt. Times New Roman font shall be used with 1.5 line spacing for typing the report.
3. 1” margin shall be left from all the sides.
4. Considering the environmental issues, students are encouraged to print on both sides of the paper.
5. The report shall be hard bound as per the standard format of the cover page given by the Institute and shall be golden embossed.
6. The report should include a Certificate (on company’s letter head) from the company duly signed by the competent authority with the stamp.
7. The report shall be signed by the respective guide(s) & the Director of the Institute 10 (Ten) days before the viva-voce examinations.
8. Student should prepare two hard bound copies of the Summer Internship Project Report and submit one copy in the institute. The other copy of the report is to be kept by the student for their record and future references.
9. At end of bridge course internship the viva –voce shall evaluate the report by University Appointed panel for 4 Credits
