KAVAYITRI BAHINABAI CHAUDHARI NORTH MAHARASHTRA UNIVERSITY, JALGAON

'A' Grade
NAAC Re-accredited
(4th Cycle)

Semester-wise Code structure and Syllabus for

Faculty: Science and Technology

B.C.A. (Honors/Research) Programme

As per NEP2020 for Affiliated Colleges

w.e.f. June 2024

Abbreviations:

- **T:** Theory Course
- **P:** Practical course
- **DSC:** Discipline Specific Core Course
- **DSE:** Discipline Specific Elective Course
- **MIN:** Minor subject
- **VSEC:** Vocational skill and Skill enhancement courses
- **VSC:** Vocational Skill Courses
- **SEC:** Skill Enhancement Courses
- **GE/OE:** Generic/open elective
- **CI:** Constitution of India
- **IKS:** Indian Knowledge System
- **CEP:** Community engagement and service
- **OJT**: On Job Training: Internship/ Apprenticeship
- **RP:** Research Project
- **RM:** Research methodology
- **ES:** Environment studies
- **ENG:** English
- **MIL:** Modern Indian language

- **Co-curricular Course (CC)**
  a) **CC-1: CC-120: Sports and Yoga**
  b) **CC-2: CC-130: Cyber Security**
  c) **CC-3: CC-220: Human Rights and Environment Law**
  d) **CC-4: CC-229: Communication Skills and Personality Development**
- **Value Education Courses (VEC)**
  a) **VEC1: ES-118: Environmental Science**
  b) **VEC2: CI-129: Constitution of India**
- **Indian Knowledge System (IKS):**
  a) **IK: 119: Ayurvedic Medicine in Ancient India**
- **Ability Enhancement Courses (AEC)**
  a) **AEC-1: EG: 101 – English -1**
  b) **AEC-2: EG: 102 – English -2**
  c) **AEC-3: MR: 201 – Marathi -1**
  d) **AEC-3: HN: 201 – Hindi -1**
  e) **AEC-3: MR: 202 – Marathi -2**
  f) **AEC-3: HN: 202 – Hindi -2**

Subject Short Name:		
Sr	**Name of Subject**	**Short Name**
1	Physics	PH
2	Mathematics	MT
3	Chemistry	CH
4	Botany	BO
5	Zoology	ZO
6	Electronics	EL
7	Computer Science	CS
8	Statistics	ST
9	Microbiology	MB
10	Biotechnology	BT
11	Information Technology	IT
12	Biochemistry	BC
13	Environmental Science	EV
14	Geography	GG
15	Geology	GE

Bachelor of Computer Application (Honors/Research) program is a four year program as per National Education Policy 2020 with effect from academic year 2024-25. Curriculum designed for BCA includes fundamentals and recent technologies required in IT industries. The Honors program is a lot industry oriented to fill the gap of employment disparity. The BCA research curriculum is aligned to the recent developments in research as well as anchoring the future research trends.

Program Educational Objectives (PEO)	
PEO 1	Participate in lifelong learning through the successful completion of advanced degrees, continuing education and certifications and/or other professional developments
PEO 2	Be successfully employed in IT as well as multidisciplinary domains in supportive and/or leadership roles
PEO 3	Be self-reliant and independent thinkers leading entrepreneurial or social journey

Program Objective (PO)	
PO 1	To gain core knowledge and a strong foundation in computer science and application
PO2	To develop applications for various domains by skills acquired in programming languages, computational tools and techniques
PO3	To demonstrate analytical and problem solving skills required in IT industry

Program Specific Outcomes (PSO)		
PSO No	PSO	Cognitive Level
BCA PSO 1	Acquire knowledge of core computer fundamentals as well as programming languages to solve problems computationally	BT Level 1
BCA PSO 2	Analyze various computational applications using domain knowledge appropriate for a defined problems	BT Level 4
BCA PSO 2	Develop solutions using domain knowledge appropriate for a defined problems	BT Level 6
BCA PSO 3	Select, adapt and apply appropriate techniques, resources and tools to develop a software	BT Level 4
BCA PSO4	Communicate effectively with or among other development teams/community by writing reports and effective presentations about computing activities	BT Level 2

BT – Bloom's Taxonomy

Semester-wise Code structure for B.C.A. (Honors/Research) Program as perNEP 2020, for Affiliated Colleges w.e.f. – June 2024											
BCA (Honors/Research) – First Year, SEMESTER – I, Level – 4.5											
Course	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Teaching Hours/ Week**			**Marks (Total 100)**			
					T	**P**	**Total**	**Internal (CA)**		**External (UA)**	
								T	**P**	**T**	**P**
DSC-1	**DSC**	**CA-111**	**Essential of Computers**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
DSC-2	**DSC**	**CA-112**	**Programming using C++**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
DSC-3	**DSC**	**CA-113**	**Practical based on Programming using C++**	**2**	**--**	**4**	**4**	**--**	**20**	**--**	**30**
MIN-1*	**MIN**	**CA-114**	**Fundamentals of Computer Applications**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
MIN-2*	**MIN**	**CA-115**	**Practical based on Fundamentals of Computer Application**	**2**	**--**	**4**	**4**	**--**	**20**	**--**	**30**
OE-1*	**OE**	**CA-116**	**Introduction to Information and Communication Technology**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
SEC-1	**SEC**	**CA-117**	**Office Management Tools**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
VEC-1	**VEC**	**EA-118**	**Environmental Awareness**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
IKS	**IKS**	**IK-119**	**Ayurvedic Medicine in Ancient India**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
CC-1	**CC**	**CC-120 (A/B)**	Select any ONE of the following: A) Sports B) Yoga	**2**	**2**	**--**	**2**	**50**	**--**	**--**	**--**
AEC-1	**AEC**	**EG-101**	**English -1**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
BCA (Honors/Research) – First Year, SEMESTER – II, Level – 4.5											
DSC-4	**DSC**	**CA-121**	**Web Designing**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
DSC-5	**DSC**	**CA-122**	**Vedic Mathematics**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
DSC-6	**DSC**	**CA-123**	**Practical based on web designing**	**2**	**--**	**4**	**4**	**--**	**20**	**--**	**30**
MIN-3*	**MIN**	**CA-124**	**Basic Office Management Tools**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
MIN-4*	**MIN**	**CA-125**	**Practical based on Office management tools**	**2**	**--**	**4**	**4**	**--**	**20**	**--**	**30**
OE-2*	**OE**	**CA-126**	**Office Automation tools**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
SEC-2	**SEC**	**CA-127**	**Computer Assembly and Repair**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
SEC-3	**SEC**	**CA-128**	**Practical based on Computer Assembly and Repair**	**2**	**--**	**4**	**4**	**--**	**20**	**--**	**30**
VEC-2	**VEC**	**CI-129**	**Constitution of India**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
CC-2	**CC**	**CC-130 (A/B)**	Select any ONE of the following: A) NSS B) NCC	**2**	**2**	**--**	**2**	**50**	**--**	**--**	**--**
AEC-2	**AEC**	**EG-102**	**English -2**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
Cumulative Credits For First Year – 44											

*** Minor is for students from other departments or disciplines.**

Semester-wise Code structure for B.C.A. (Honors/Research) Program as perNEP 2020, for Affiliated Colleges w.e.f. – June 2024											
BCA (Honors/Research) – Second Year, SEMESTER – III, Level – 5.0											
Course	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Teaching Hours/ Week**			**Marks (Total 100)**			
					T	**P**	**Total**	**Internal (CA)**		**External (UA)**	
								T	**P**	**T**	**P**
DSC-7	**DSC**	**CA-211**	**Data Structures**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
DSC-8	**DSC**	**CA-212**	**Python Programming**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
DSC-9	**DSC**	**CA-213**	**Practical based on Data Structures**	**2**	**--**	**4**	**4**	**--**	**20**	**--**	**30**
DSC-10	**DSC**	**CA-214**	**Practical based on Python Programming**	**2**	**--**	**4**	**4**	**--**	**20**	**--**	**30**
MIN-5*	**MIN**	**CA-215**	**Introduction to Programming Languages**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
MIN-6*	**MIN**	**CA-216**	**Practical based on Programming Languages**	**2**	**--**	**4**	**4**	**--**	**20**	**--**	**30**
OE-3*	**OE**	**CA-217**	**Computer Graphics**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
VSC-1	**VSC**	**CA-218**	**Introduction to Graphics Designing**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
VSC-2	**VSC**	**CA-219**	**Practical based on Graphics Designing**	**2**	**--**	**4**	**4**	**--**	**20**	**--**	**30**
CC-3	**CC**	**CC-220 (A/B)**	**Select any ONE of the following:** A) Human Rights and Environment Law B) Cyber Security	**2**	**2**	**--**	**2**	**50**	**--**	**--**	**--**
AEC-3	**AEC**	**MR-201**	**Marathi -1**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
		HN-201	**Hindi -1**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
BCA (Honors/Research) – Second Year, SEMESTER – IV, Level – 5.0											
DSC-11	**DSC**	**CA-221**	**Database Management System**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
DSC-12	**DSC**	**CA-222**	**Artificial Intelligence**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
DSC-13	**DSC**	**CA-223**	**Practical based on Database Management System**	**2**	**--**	**4**	**4**	**--**	**20**	**--**	**30**
DSC-14	**DSC**	**CA-224**	**Practical based on Artificial Intelligence using Python**	**2**	**--**	**4**	**4**	**--**	**20**	**--**	**30**
MIN-7*	**MIN**	**CA-225**	**Web Designing and Development**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
MIN-8*	**MIN**	**CA-226**	**Practical based on Web designing and Development**	**2**	**--**	**4**	**4**	**--**	**20**	**--**	**30**
OE-4*	**OE**	**CA-227**	**Social Media for Beginners**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
CEP	**CEP**	**CA-228**	**Community Engagement and Service**								
CC-4	**CC**	**CC-229 (A/B)**	**Select any ONE of the following:** A) Communication Skills and Personality Development B) Cultural	**2**	**2**	**--**	**2**	**50**	**--**	**--**	**--**
AEC-4	**AEC**	**MR-202**	**Marathi -2**	**2**	**2**	**--**	**2**	**20**	**--**	**30**	**--**
		HN-202	**Hindi -2**								
Cumulative Credits for First Year – 44											

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Semester-wise Code structure for B.C.A. (Honors/Research)
Program as perNEP 2020, for Affiliated Colleges w.e.f. – June 2024

BCA (Honors/Research) – Third Year, SEMESTER – V, Level – 5.5

Course	Course Type	Course Code	Course Title	Credits	Teaching Hours/ Week			Marks (Total 100)			
					T	P	Total	Internal (CA)		External (UA)	
								T	P	T	P
DSC-15	DSC	CA-311	Software Engineering	2	2	--	2	20	--	30	--
DSC-16	DSC	CA-312	Programming using C#.Net	2	2	--	2	20	--	30	--
DSC-17	DSC	CA-313	JAVA Programming	2	2	--	2	20	--	30	--
DSC-18	DSC	CA-314	Practical based on C#.Net	2	--	4	4	--	20	--	30
DSC-19	DSC	CA-315	Practical based on JAVA Programming	2	--	4	4	--	20	--	30
DSE-1	DSE	CA-316 (A)	Web Technologies I (PHP)	2	2	--	2	20	--	30	--
		CA-316 (B)	Data Analytics (Using R)	2	2	--	2	20	--	30	--
		CA-316 (C)	Advance Artificial Intelligence techniques	2	2	--	2	20	--	30	--
DSE-2	DSE	CA-317 (A/B/C)	Practical based on selected elective DSE - 1	2	--	4	4	--	20	--	30
MIN-9*	MIN	CA-318	Website Development and Management	2	2	--	2	20	--	30	--
VSC-3	VSC	CA-319	Software Development using Recent tools and techniques	2	2	--	2	20	--	30	--
FP	FP	CA-320	Field Project	4	--	8	8	--	40	--	60

BCA (Honors/Research) – Third Year, SEMESTER – VI, Level – 5.5

DSC-20	DSC	CA-321	Cloud Computing	2	2	--	2	20	--	30	--
DSC-21	DSC	CA-322	Recent Scripting Languages	2	2	--	2	20	--	30	--
DSC-22	DSC	CA-323	Android Application Development	2	2	--	2	20	--	30	--
DSC-23	DSC	CA-324	Practical based on Scripting Languages	2	--	4	4	--	20	--	30
DSC-24	DSC	CA-325	Practical based on Android Application Development	2	--	4	4	--	20	--	30
DSE-3	DSE	CA-326 (A)	Web Technologies II (ASP.Net)	2	2	--	2	20	--	30	--
		CA-326 (B)	Data Analytics II (Exploratory Data Analytics)	2	2	--	2	20	--	30	--
		CA-326 (C)	Machine Learning	2	2	--	2	20	--	30	--
DSE-4	DSE	CA-327 (A/B/C)	Practical based on selected elective DSE - 3	2	--	4	4	--	20	--	30
MIN-10*	MIN	CA-328	Social Media Marketing	2	2	--	2	20	--	30	--
VSC-4	VSC	CA-329	Digital Marketing	2	2	--	2	20	--	30	--
#OJT/ Int	OJT/Int	CA-330	On Job Training/Internship	4	--	8	8	--	40	--	60

Students need to complete one month on job training **(OJT)** or internship in any industry relatedto major subject. *** Minor is for students from other departments or disciplines.**

Semester-wise Code structure for B.C.A. (Honors/Research)
Program as perNEP 2020, for Affiliated Colleges w.e.f .– June 2024

BCA(Honors/Research) – 4th Year (Honors), SEMESTER – VII, Level – 6.0

Course	Course Type	Course Code	Course Title	Credits	Teaching Hours/ Week			Marks (Total 100)			
					T	P	Total	Internal (CA)		External (UA)	
								T	P	T	P
DSC-25	DSC	CA-411	Advanced Database Management Systems	4	4	--	4	40	--	60	--
DSC-26	DSC	CA-412	Advanced Software Development methodologies	2	2	--	2	20	--	30	--
DSC-27	DSC	CA-413	Advanced Java Programming	4	4	--	4	40	--	60	--
DSC-28	DSC	CA-414	Practical based on ADBMS	2	--	4	4	--	20	--	30
DSC-29	DSC	CA-415	Practical based on Advanced Java Programming	2	--	4	4	--	20	--	30
DSE-5	DSE	CA-416 (A)	Current Web Technologies I	4	4	--	4	40	--	60	--
		CA-416 (B)	Big Data	4	4	--	4	40	--	60	--
		CA-416 (C)	Deep Learning	4	4	--	4	40	--	60	--
RM	RM	CA-417	Research Methodology	4	4	--	4	40	--	60	--

BCA (Honors/Research) – 4th Year (Honors), SEMESTER – VIII, Level – 6.0

DSC-30	DSC	CA-421	Advanced Cloud Computing	4	4	--	4	40	--	60	--
DSC-31	DSC	CA-422	Data Mining	2	2	--	2	20	--	30	--
DSC-32	DSC	CA-423	Social Media tools and Technique	4	4	--	4	40	--	60	--
DSC-33	DSC	CA-424	Practical based on Cloud Computing	2	--	4	4	--	20	--	30
DSC-34	DSC	CA-425	Practical based on social media tools and techniques	2	--	4	4	--	20	--	30
DSE-6	DSE	CA-426(A)	Current Web Technologies II	4	4	--	4	40	--	60	--
		CA-426(B)	Business Intelligence	4	4	--	4	40	--	60	--
		CA-426(C)	Generative Artificial Intelligence	4	4	--	4	40	--	60	--
#OJT/ Int	OJT/Int	CA-427	On Job Training/Internship	4	--	8	8	--	40	--	60

#Students need to complete one month on job training **(OJT)** or internship in any industry related to major subject.

Semester-wise Code structure for B.C.A. (Honors/Research)
Program as perNEP 2020, for Affiliated Colleges w.e.f. – June 2024

BCA (Honors/Research) – 4th Year (Research), SEMESTER – VII, Level – 6.0

Course	Course Type	Course Code	Course Title	Credits	Teaching Hours/ Week			Marks (Total 100)			
					T	P	Total	Internal (CA)		External (UA)	
								T	P	T	P
DSC-25	DSC	CA-411	Machine Learning Algorithm	4	4	--	4	40	--	60	--
DSC-26	DSC	CA-412	Digital Image Processing	2	2	--	2	20	--	30	--
DSC-28	DSC	CA-414	Practical based on Machine Learning Algorithm	2	--	4	4	--	20	--	30
DSC-29	DSC	CA-415	Practical based on Digital Image Processing	2	--	4	4	--	20	--	30
DSE-5	DSE	CA-416 (A)	Network Programming	4	4	--	4	40	--	60	--
		CA-416 (B)	Cyber Security: Techniques and Tools	4	4	--	4	40	--	60	--
		CA-416 (C)	Natural Language Processing	4	4	--	4	40	--	60	--
RM	RM	CA-417	Research Methodology	4	4	--	4	40	--	60	--
RP	RP	CA-418	Research Project I	4	--	8	8	--	40	--	60

BCA (Honors/Research) – 4th Year (Research), SEMESTER – VIII, Level – 6.0

DSC-30	DSC	CA-421	Data Science	4	4	--	4	40	--	60	--
DSC-31	DSC	CA-422	Vision Intelligence	2	2	--	2	20	--	30	--
DSC-33	DSC	CA-424	Practical based on Applied Data Science using Python	2	--	4	4	--	20	--	30
DSC-34	DSC	CA-425	Practical based on Vision Intelligence	2	--	4	4	--	20	--	30
DSE-6	DSE	CA-426(A)	Internet of Things	4	4	--	4	40	--	60	--
		CA-426(B)	Cyber Forensics	4	4	--	4	40	--	60	--
		CA-426(C)	Block Chain Technology	4	4	--	4	40	--	60	--
RP	RP	CA-428	Research Project II	8	--	16	16	--	80	--	120

Course Code: CA-111
Course Title: Essential of Computer

Course Code: CA-111	**Course Category: (DSC-1)**
Course Title: Essential of Computer	**Type: Theory**
Total Contact Hours: 30 (2/week)	**Course Credits: 02**
College Assessment (CA) Marks: 20 Marks	**University Assessment (UA): 30 Marks**

Course Objectives:

1. This course provides an overview of introductory concepts about computers, number systems and components of computer system.
2. This course provides an overview of the fundamental concepts of computer networks, data communication, and network topologies.

CO No.	CO	Cognitive level
BCA111C.1	Acquire the knowledge of fundamentals of Computer and Operating System.	2
BCA111C.2	Develop problem solving skill through algorithms and flowcharts.	3
BCA111C.3	Understand the basics of computer networking and internet.	2

Course Content:

Unit 1: Introduction to Basics of Computer **(07 L, 10 M)**

1. Basics of computer:
   - 1.1. What is Computer?
   - 1.2. History of Computers
2. Block Diagram of Computer
   - 2.1. Diagrams
   - 2.2. Input, Output, ALU, CPU, CU
3. Types of Computer
   - 3.1. Analog computers, Digital Computers, Hybrid computers
4. Memory Management
   - 4.1. Primary Memory-RAM, ROM, PROM, EPROM
   - 4.2. Secondary Memory- Magnetic Disk, Hard Disk and CD
5. Types of Software
   - 5.1. System Software
     - 5.1.1. Anti-Virus
     - 5.1.2. Honey pot system
   - 5.2. Application Software
     - 5.2.1. Word Processing
     - 5.2.2. Spreadsheets
6. Programming Languages
   - 6.1. High level
   - 6.2. Middle Level
   - 6.3. Low Level

Unit 2: Introduction to Operating System **(08 L, 10M)**

1. What are booting?
   - 1.1. POST
   - 1.2. Bootstrap
   - 1.3. Boot Drive
2. Definition of operating system
3. Functions of operating system

4. Types of Operating Systems
   4.1. DOS
   4.2. Windows
   4.3. Linux
   4.4. Android
5. Applications of Operating System
6. Comparison of various Operating Systems

Unit 3: Introduction to Internet and Concepts of Network (07 L, 15 M)

1. Fundamentals Of Internet
   1.1. Introduction to the Internet
   1.2. History of the Internet
   1.3. Working and Use of the Internet
   1.4. Applications of the Internet
   1.5. Study of Web Browsers and Search Engines
2. Fundamentals Of Computer Networks
   2.1 What is a Computer Network?
   2.2 Types of Networks (with Features and Application): LAN, WAN, MAN
   2.3 Wired Network, Wireless Network
   2.4 Network Topology
   2.5 Web Services
   2.6 Dial-Up Connections
   2.7 Shell Connection
   2.8 TCP/IP Connection
3. Introduction to Viruses
   3.1 What is a Computer Virus?
   3.2 Function of Virus
   3.3 Types of Computer Virus

Unit 4: Fundamentals of Procedural Programming Paradigms (08 L, 15 M)

1. Algorithm
   1.1 Definition of Algorithm
   1.2 Introduction of Algorithm
   1.3 Example of Algorithm
2. Flowchart
   2.1 Definition of Flowchart
   2.2 Introduction of Flowchart
   2.3 Example of Flowchart
3. Data Representation
   3.1 Conversion in number System
   3.2 Decimal, binary
   3.3 Octal and hexadecimal
   3.4 Character representation: ASCII

Reference Books:

1. V.RajaRaman, “Fundamentals of computer”(PHI Publication) ***ISBN***10:8120340116
2. Roger Huntand John Shelley, “Computer and commonsense” (PHI Publication) ***ISBN***10:0131646737
3. AndrewS.Tanenbaum, “Computer Networks”–Fourth Edition. ***ISBNnumber***0130661023
4. Hurwitz Judith S. and Daniel Kirsch, “Cloud Computing for Dummies”. ISBN
5. Godbole Achyut and Kahate Atul, “Web Technologies: TCP/IP, Web/ Java Programming, and Cloud
6. Computing, ”, 3e Tata McGraw-Hill Education ISBN: 9332900914, 9789332900912.
7. "Operating System Concepts" by Abraham Silberschatz, Peter B. Galvin, Greg Gagne

Course Code: CA 112
Course Title: Programming Using C++

Course Code: CA-112	**Course Category: DSC-2**
Course Title: Programming Using C++	**Type: Theory**
Total Contact Hours: 30 (2/week)	**Course Credits: 02**
College Assessment (CA) Marks: 20 Marks	**University Assessment (UA): 30 Marks**

Course Objectives:

1. To understand the concept of Object Oriented Programming
2. To Understand the concept of implementing Functions, Pointer, and Array in C++
3. To Understand the concept of implementing Class, Object, Inheritance and polymorphism
4. To understand the concepts of Exception handling and File management

CO No.	CO	Cognitive level
BCA112C.1	Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.	1
BCA112C.2	Understand dynamic memory management techniques using pointers, constructors, destructors.	2
BCA112C.3	Apply the concept of function overloading, operator overloading, virtual functions and polymorphism in programming with C++	3
BCA112C.3	Demonstrate the use of various OOPs concepts with the help of programs	2

Course Content:

Unit 1: Introduction **(10 L, 10 M)**

1. History of C++
2. Structured Vs Object oriented development
3. OOP's Features - Object, Classes, Data Encapsulation & Abstraction, Delegation, Inheritance, Polymorphism, Message Communication.
4. Basic concept of C++
   - 4.1. Input/ Output in C++
   - 4.2. Data Types, Operators
   - 4.3. If statement (if, if…else, if..else if, nested if, Switch)
   - 4.4. Loops,
   - 4.5. Array, Types of Array
   - 4.6. Using #include and #define, creating macros

Unit 2: Functions and Oops in C++ **(07 L, 15 M)**

1. Function and its components,
2. Concept of Pointer
3. Different types of parameter passing mechanisms,
4. Access Specifier
5. Class Specification- Defining Members
6. Creating Objects
7. Constructors, types of Constructors, destructor
8. Friend Class and Friend Function

Unit 3: Inheritance & Polymorphism **(06 L, 15 M)**

1. Function overloading

2. Operator Overloading- unary, binary operators, using friend functions
3. Types of Inheritance
4. Member Accessibility
5. Visibility Modes
6. Abstract class
7. Virtual & Pure Virtual functions

Unit 4: C++ Handling Concept and Template **(07 L, 10 M)**

1. Exception handling
2. Types of Exception
3. Try … Catch Block
4. File Handling
5. Read and write operations on file
6. Class template
7. Function template

Reference Books:

1. Mastering C++ by K R Venugopal, Rajkumar, T Ravishankar, Publication - TMH
2. Exploring C++ by Yashwant Kanetkar
3. Object Oriented Programming using C++ by W. Balguruswamy, Publication - TMH
4. The C++ Programming Language by BjaraneStroustrup

Course Code: CA-113
Course Title: Practical Based on Programming Using C++

Course Code: CA-113	**Course Category: (DSC-3)**
Course Title: Practical Based on Programming Using C++	**Type: Practical**
Total Contact Hours: 60 (4/week)	**Course Credits: 02**
College Assessment (CA) Marks : 20 Marks	**University Assessment (UA): 30 Marks**

Course Objectives:

1. To train students in programming using object oriented concepts with C++.
2. To acquired practical oriented skill set using C++
3. To solve well defined problem through assignments in C++

Course Outcomes:

CO No.	CO	Cognitive level
BCA113C.1	Creating simple programs using C++	6
BCA113C.2	Solve well defined problems using C++	6
BCA113C.3	Apply various OOPs concepts or features using C++ programs	3
BCA113C.3	Implement Exception handling and file handling using C++	3

Course Content:

Number Logical Program

1. Write a program to print Fibonacci series.
2. Write a program to check given number is prime or not
3. Write a program to print prime numbers in given range.
4. Write a program to check given number is palindrome or not
5. Write a program to print palindrome numbers in given range.
6. Write a program to find given number is perfect or not.
7. Write a program to check given number is Armstrong or not.
8. Write a program to print factorial of a number.
9. Write a program to print sum of digits.
10. Write a program to print max digit in given number.

Program using OOP's

11. Write a program to demonstrate Array.
12. Write a program to demonstrate the use of class and object
13. Write a program to demonstrate function overloading.
14. Write a program to demonstrating the use Operator Overloading.
15. Write a program to demonstrate Class and Object.
16. Write a program to demonstrating the use of constructors and destructor
17. Write a program to demonstrate the Single & multiple inheritances.
18. Write a program to demonstrate multilevel and hierarchical inheritance
19. Write a program to demonstrate the use of virtual function.
20. Write a program to demonstrate Exception Handling.
21. Write a program to demonstrate File handling
22. Write a program to demonstrate the concept of function template & class template.
23. Write a program to demonstrate Friend Class and Friend Function.

Course Code: CA 114
Course Title: Fundamentals of Computer Application

Course Code: CA 114	**Course Category: Minor -1** ***For students from other Department/Discipline**
Course Title: Fundamentals of Computer Application	**Type: Theory**
Total Contact Hours: 30	**Course Credits: 02**
College Assessment (CA) Marks: 20	**University Assessment (UA): 30**

Course Objectives:

1. To Introduce the fundamental concepts of computers
2. To introduce concepts of networking
3. To introduce basic components of programming

Course Outcomes:

CO No.	CO	Cognitive level
BCA114C.1	Understand basics of computer, operating systems and types of software	2
BCA114C.2	Understand fundamental concept Networking and Internet	2
BCA114C.3	Analyze problems to draw flow charts and write algorithm for given problems	5

Course Content:

Unit 1: Introduction to Basics of Computer **(06 L, 15 M)**

1 Basics of computer
- 1.1 What is Computer?
- 1.2 History of Computers

2 Block Diagram of Computer
- 2.1 Diagrams
- 2.2 Input, Output, ALU, CPU, CU

3 Types of computer
- 3.1 Analog computers
- 3.2 Digital computers
- 3.3 Hybrid computers

4 Memory Management:
- 4.1 Primary Memory-RAM, ROM, PROM, EPROM,
- 4.2 Secondary Memory- Magnetic Disk, Hard Disk and CD

5 Types of software
- 5.1 System Software:
  - 5.1.1 Anti-Virus
  - 5.1.2 Honey pot system
- 5.2 Application Software:
  - 5.2.1 Word Processing
  - 5.2.2 Spread sheet
  - 5.2.3 Presentation

Unit 2: Operating Systems **(06 L, 10M)**

1. Introduction to the Operating System
2. Functions of operating system

3. Types of Operating Systems

    3.1. Linux
    3.2. Windows
    3.3. Mac
    3.4. Android
4. Applications of Operating System
5. Comparison of various Operating Systems

Unit 3: Fundamentals of Network & Internet (12 L, 15M)

1. What is Computer Network?
2. Network Services
    2.1. Communication Services
    2.2. WWW, e-mail, FTP, Telnet
3. Network topologies
    3.1. Star
    3.2. Bus
    3.3. Tree
    3.4. Ring
    3.5. Mesh
3. Fundamentals of Internet
    3.1. What is Internet?
    3.2. History of Internet
    3.3. Applications of Internet
4. Types of Connections
    4.1. Dial-Up Connections
    4.2. TCP/IP Connection

Unit 4: Fundamentals of Procedural Programming Paradigms (06 L, 10 M)

1. Algorithm
    1.1. Definition of Algorithm
    1.2. Introduction of Algorithm
    1.3. Example of Algorithm
2. Flowchart
    2.1. Definition of Flowchart
    2.2. Introduction of Flowchart
    2.3. Example of Flowchart

Reference Books:

1. Pradeep K Sinha, Computer Fundamental, BPB Publications 6th Edition.
2. C.S.V Murthy, Fundamental of Computer, Himalaya Publication House 1st Edition.
3. Balagurusamy, Fundamental of Computer,McGraw Hill Publisher Private Ltd.
4. S.R. Sathe MAC Mollen, Operating System, Publications India Ltd 1st Edition.

Course Code: CA- 115
Course Title: Practical based on Computer Fundamentals

Course Code: CA-115	**Course Category: Minor -2** ***For students from other Department/Discipline**
Course Title: Practical based on Computer Fundamentals	**Type: Practical**
Total Contact Hours: 30	**Course Credits: 02**
College Assessment (CA) Marks:30	**University Assessment (UA): 20**

Course Objectives:

- To familiarize students with the fundamental operation of a computer
- To introduce students to basic internet concepts and how to use a web browser to navigate the internet.

Course Outcomes:

CO No.	CO	Cognitive level
BCA115C.1	Students can able to understand the installation of operating system.	2
BCA115C.2	Students can understand basic DOS command, and different browser.	2
BCA115C.3	Students understand different platforms, Internet, mails, tables.	2
BCA115C.4	Students can learn text formatting and table formatting.	3

Course Content:

1. Installation of Operating System (Linux and Windows).
2. Run different commands of MS DOS – CD, DIR, COPY, REN, CLS, MD, RD, Exit, Clear etc.
3. Demonstrate different web Browsers- Internet Explorer, Fire fox, downloading of files
4. Demonstrate information of Internet connectivity components Modem, IP Sharer, Hub, and Switch
5. Demonstrate different platforms – Hardware, Software, Server and Cloud.
6. Create your E-Mail ID on any free E-Mail Server.
7. Login through your E-Mail ID and do the following:
   a) Compose a new Mail
   b) Send the Mail to one person
   c) Send the same Mail to various persons
   d) Forward the Mail
   e) Delete the Mail
   f) Send file as attachment
8. Send any greeting card to your friend.

Course Code: CA 116
Course Title: Introduction to Information Communication and Technology

Course Code: CA 116	**Course Category: OE -1** ***For students from other Department/Discipline**
Course Title: Introduction to Information Communication and Technology	**Type: Theory**
Total Contact Hours: 30	**Course Credits: 02**
College Assessment (CA) Marks: 20	**University Assessment (UA): 30**

Course Objectives:

4. To introduce the fundamental concepts of Information Technology.
5. To introduce concepts of Information Technology and Technology.
6. To introduce basic components of programming

Course Outcomes:

CO No.	CO	Cognitive level
BCA116C.1	Define and explain various concepts of Information Communication and Technology	1
BCA116C.2	Understand basics of cyber spaces and cyber crime	2
BCA116C.3	Understand application areas of ICT broadly	2

Course Content:

Unit 1: Attributes of Information Technology **(08 L, 10 M)**

6 Data, Knowledge and Wisdom
7 Types of Information
8 Sources of Information
9 Quality of Information
10 Storage of Information

Unit 2: Information Communication and Technology **(07 L, 15M)**

6. What is ICT?
7. Evolution of ICT
8. Benefits of ICT
9. Advances in ICT
10. Information Systems
11. Types of Information Systems

Unit 3: Cyber Space and Cyber Crime **(07 L, 10M)**

4. Real Space Vs. Cyber Space
5. Digital Identity
6. What is Cyber Crime?
7. Types of Cyber Crime
8. Causes and effects of Cyber Crime

Unit 4: Real time ICT applications **(08 L, 15 M)**

1. E-commerce
2. e-governance
3. Education System
4. Medical System

Reference Books:

5. Information Technology: Theory and practise, Sinha Pradeep K, Sinha Priti, ISBN 9788120352247
6. Information Systems: A concise study, Kelkar S A, ISBN 9788120336513

7. Student's guide to Information technology, Second Edition, Roger Carter, ISBN 9781483183831
8. The Absolute beginners guide to Cyber Security 2023- Part 1, Alexander Oni, 9781837630943

Course Code: CA-117
Course Title: Office Management Tools

Course Code: CA-117	**Course Category: (SEC-1)**
Course Title: Office Management Tools	**Type: Theory**
Total Contact Hours: 30 (02/week)	**Course Credits: 02**
College Assessment (CA) Marks: 20 Marks	**University Assessment (UA): 30 Marks**

Course Objectives:

1. To provide an in-depth training in use of office automation, internet and internet tools.
2. The course also helps the candidates to get acquainted with IT.

CO No.	CO	Cognitive level
BCA117C.1	After completion of the course, students would be able to create documents, spread sheets, make small presentations and would be acquainted with internet.	4
BCA117C.2	Identify and navigate different components of the MS Office interface, including ribbons, menus, and toolbars.	3
BCA117C.3	Create and format professional-looking text documents using MS Word, Spreadsheet using excel and presentations using powerpoint and able to use advance features in MS Office.	6

UNIT 1: Elements of ICT **(04 L, 10 M)**

1. Definition of ICT
2. Applications of ICT
3. Impact of ICT in business
4. Communication tools - Email, chatting, Social Networking, video conferencing
5. Different ICT Tools

UNIT 2: Word Processing **(08 L, 13 M)**

1. Introduction to Office Automation Suites
2. Components of MS-Office
3. Features of MS-Office 2010
4. Interface of MS-Word 2010
5. Text Formatting, Paragraph Formatting, Page Formatting
6. Header & Footers, Templates
7. Working with Graphics and Pictures, Symbols
8. Working with Tables,
9. Multicolumn News Letter, Smart Art
10. Mail Merge, Printing, Spell Check
11. View, Split, Arrange All

UNIT 3: Working with Excel 2010 **(10 L, 15 M)**

1. Introduction to Worksheets and Workbooks,
2. Working with Worksheet - Inserting, Deleting, Rename
3. Inserting and Deleting Rows and Columns
4. Format - Row Height, Column Width, Auto-fit, Hide/Unhide
5. Working with Data – Sorting, Filter, Conditional formatting
6. Wrap Text, Merge & Center

7. Page Formatting – Margin, Orientation, Size, Print Area, Break
8. Formulas, Inbuilt Functions
Basic functions – SUM, COUNT, AVERAGE, MIN, MAX
Advanced functions: UPPER, LOWER, TRIM, LEN, IF… condition, Remove duplicates
9. Inserting Images and Graphics,
10. Creating and Working with Charts
11. Printing Worksheets

UNIT 4: Working with PowerPoint Presentation 2010 (08 L, 12 M)

1. Introduction to Power Point,
2. Basics of Creating Presentations,
3. Applying Themes and Layouts
4. Working with Objects, Entering, Editing, and Formatting Text
5. Inserting Pictures, Graphics, Shapes, Charts and SmartArt
6. Inserting Tables into Presentations,
7. Adding Sound and Video
8. Adding Transitions Effects and Animation,
9. Normal view, Slide

References –

1. V. Rajaraman, “Fundamentals of Computers”, PHI publication.
2. Roger Hunt and John Shelley, “Computers and Commonsense”, PHI publication
3. A. S.Tananbaum, “Computer Network”
4. Vipra Computers, “Microsoft Office 2007”, Vipra Printers Pvt. Ltd.
5. Ed Bott and Woody Leonhard, “Special Edition Using Microsoft Office 2007” Misty Vermaat, “Microsoft Office 2013”, Shelly Cashman

Course Code: CA-121
Course Title: WEB DESIGNING

Course Code: CA-121	**Course Category: (DSE-4)**
Course Title: Web Designing	**Type: Theory**
Total Contact Hours: 30 (2/week)	**Course Credits: 02**
College Assessment (CA) Marks: 20 Marks	**University Assessment (UA): 30 Marks**

Course Objectives:

1. To learn basic HTML tags.
2. To design static Webpage.
3. To define styles for web pages using CSS.
4. To create a dynamic and interactive web page using Javascript

Course Outcomes:

CO No.	CO	Cognitive level
BCA121C.1	Make use of HTML to design a web page.	3
BCA121C.2	Build simple static Web application.	6
BCA121C.3	Make use of different CSS stylesheets in web designing.	3
BCA121C.4	Understand scripting language which helps to develop interactive webpage	2

Course Content:

Unit 1: HTML **(08 L, 10 M)**

1.1 Introduction to HTML
1.2 Structure of HTML
1.3 HTML Tags, Attributes of HTML
1.4 Formatting Tags and Attributes
1.5 Headings Tag, Paragraph Tag
1.6 Ways to define color – Plain color, RGB, Hex value, HSL value
1.7 Inserting an Images
1.8 List tags and Attributes - <OL>, <UL>, <DL>
1.9 Tables Tags and Attributes
1.10 Hyperlinks – Internal and External Linking, Image links
1.11 Frameset, Frames and iFrame

Unit 2: HTML form designing and HTML 5 **(07L, 10 M)**

2.1 Designing of Forms
2.2 Designing form using HTML input tags
2.3 Inserting Text box, Text area, List box, Buttons, Radio Button, and Checkbox etc.
2.4 GET and POST methods

Unit3: CSS **(07L, 15 M)**

3.1 Introduction to Style Sheet
3.2 Ways to apply CSS to HTML
3.3 CSS Structure
3.4 Types of CSS – Inline, Internal, External.
3.5 Introduction to selectors
3.6 Element Selector
3.7 ID Selector
3.8 Class Selector
3.9 Universal Selector
3.10 CSS Text Formatting properties
3.11 CSS Border, Margin, Padding, Content

3.12 Use of <DIV> and <SPAN>
3.13 Introduction of CSS3: Gradients, Transitions, Animations, multiple columns

Unit 4: JavaScript (08L, 15 M)

4.1 Introduction to JavaScript
4.2 Advantages of JavaScript
4.3 Variables, identifiers and operators,
4.4 Control Structures
4.5 Function in JavaScript
4.6 Introduction to Event Handling in JavaScript
4.7 Math Object and properties in JavaScript
4.8 String functions in JavaScript
4.9 DOM concept in JavaScript, DOM objects
4.10 Introduction to Validations in JavaScript

References –

1. HTML CSS in 8 Hours, For Beginners, Learn Coding Fast, Ray Yao, 2018
2. HTML and CSS: Design and Build Websites, John Duckett, Publication - John Wiley, 2011
3. HTML and CSS : Quick Start Guide, David Durocher, 2021
4. Textbook of Web Designing, Joel Sklar, Cengage Learning, Publication 2009
5. Web designing in Nut Shell (Desktop Quick Reference) by Jennifer Niederst Publication – O'Reilly publication, 2006.
6. Designing web navigation by James Kalbach Publication – O'Reilly publication Textbook of Web Designing, Joel Sklar, Cengage Learning Publication 2009, ISBN, 1423901940
7. Web Design-II, Textbook, Mahesh Bhavsar, Rupali Mekha, Sweta Phegade, Prashant Publication, 2022

Course Code: CA-122
Course Title: Vedic Mathematics

Course Code: CA-122	**Course Category: (DSE-5)**
Course Title: Vedic Mathematics	**Type: Theory**
Total Contact Hours: 30 (02/week)	**Course Credits: 02**
College Assessment (CA) Marks: 20 Marks	**University Assessment (UA): 30 Marks**

Course Objectives:

1. Gain an understanding of the historical and cultural context in which Vedic mathematics developed.
2. Learn and apply fundamental Vedic mathematical sutras for addition, subtraction, multiplication, and division.
3. Develop the ability to perform mental calculations quickly and accurately using Vedic methods.
4. Use Vedic mathematics to solve geometry problems.

Course Outcomes:

CO No.	CO	Cognitive level
BCA122C.1	Apply Vedic sutras effectively to perform mental calculations, leading to improved speed and accuracy in arithmetic operations.	3
BCA122C.2	Utilize Vedic methods to simplify geometry and trigonometry problems, enhancing problem-solving skills in these areas.	3
BCA122C.3	Demonstrate ethical mathematical practices, including proper attribution of sources and responsible problem-solving	2

Course Content:

Unit 1: Introduction to Vedic Mathematics **(08 L, 10 M)**

1. Historical background and significance of Vedic mathematics.
2. Overview of Vedic mathematical techniques and sutras.
3. Benefits of learning Vedic mathematics.
4. Introduction to mental calculation strategies.

Unit 2: Basic Operations **(08 L, 10 M)**

1. Addition and subtraction using Vedic sutras.
2. Sutra: "Nikhilam Navatashcaramam Dashatah" (All from 9 and the last from 10).
3. Multiplication techniques.
4. Sutra: "Urdhva-Tiryagbhyam" (Vertically and crosswise).
5. Division techniques.
6. Sutra: "Paravartya Yojayet" (Transpose and apply).
7. Practical exercises and problems involving these operations.

Unit 3: Advanced Multiplication and Division **(08 L, 15 M)**

1. Advanced multiplication of numbers with specific patterns.
2. Sutra: "Ekadhikena Purvena" (By one more than the previous one).
3. Squaring numbers.
4. Sutra: "Anurupyena" (Proportionately).
5. Finding square roots.
6. Sutra: "Shunyam Saamyasamuccaye" (The sum of the same in balance).
7. Cube roots and cube calculations.

8. Sutra: "Varga Yojayet" (By the completion or non-completion in the square).

Unit 4: Algebraic Techniques **(06 L, 15 M)**

1. Solving algebraic equations using Vedic methods.
2. Simplifying and factorizing algebraic expressions.
3. Applying Vedic mathematics to polynomial and quadratic equations.
4. Practical exercises and problem-solving in algebra.
5. Using Vedic techniques to solve geometry problems.
6. Trigonometric calculations made easier with Vedic methods.

Reference Books:

1. Bharati Krsna Tirthaji, “Vedic Mathematics: Sixteen Simple Mathematical Formulae From The Vedas”
2. Dhaval Bathia "Vedic Mathematics Made Easy"
3. Kenneth Williams "Vedic Mathematics for All Ages: A Beginner's Guide"

Course Code: CA-123
Course Title: Practical based on Web Designing

Course Code: CA-123	**Course Category: (DSE-6)**
Course Title: Practical based on Web Designing	**Type: PRACTICAL**
Total Contact Hours: 60 (4/week)	**Course Credits: 02**
College Assessment (CA) Marks: 20 Marks	**University Assessment (UA): 30 Marks**

Course Objectives:

1. To understand basic HTML tags.
2. To design static Webpage.
3. To define styles for web pages using CSS.
4. To create a dynamic and interactive web page using Javascript

Course Outcomes:

At **CO No.**	**CO**	**Cognitive level**
BCA123C.1	Design and create a website using text; fonts; color; images; tables; hyperlinks; language and terminology	6
BCA123C.2	Designing, creating and applying an external style sheet to a multiple page web site.	6
BCA123C.3	Make use of tags to develop effective web page navigation and design web page layout.	3
BCA123C.4	Effectively use style sheet as well as JavaScript in web page	3

Course Content:

1. Create web page using Different Formatting tag.
2. Create Web page with different Images.
3. Create web page using Marquee Tag and Attributes.
4. Create a web page using different List tag.
5. Create web page using Anchor Tag (Internal Link and External Link)
6. Create web page to design time table of your college using Table tag.
7. Create web page inserting Audio and Video files.
8. Design a web page using Frames and Frameset Tag and attributes.
9. Demonstrate target frameset in HTML.
10. Design static webpage of College Admission Form using Form tag.
11. Design a web page using Inline and Internal CSS.
12. Demonstrate the use of External CSS
13. Demonstrate Class selector in web page using CSS.
14. Demonstrate ID selector in web page using CSS.
15. Demonstrate Universal selector in web page using CSS.
16. Write a program to embed JavaScript into HTML.
17. Write a JavaScript code to demonstrate Conditional Statements
18. Write a JavaScript code to demonstrate Looping Statements
19. Write JavaScript code to demonstrate different string functions.
20. Write a program to demonstrate Event Handling.

Course Code: CA 124
Course Title: Office Management Tools

Course Code: CA-124	**Course Category: Minor -3** ***For students from other Department/Discipline**
Course Title: Office Management Tools	**Type: Theory**
Total Contact Hours: 30	**Course Credits: 02**
College Assessment (CA) Marks:30	**University Assessment (UA): 20**

Course Objectives:

1. To impart fundamental knowledge on the Word Processing software.
2. To impart basic skill on the Power Point Presentation
3. To impart basic skill on the spread sheet package

Course Outcomes:

CO No.	CO	Cognitive level
BCA124C.1	Able to perform documentation and presenting skills.	3
BCA124C.2	Design layouts and templates for presentation.	6
BCA124C.3	Organize, visualize and restructure data using different formulas of spread sheets.	5

Course Content:

Unit :1 Word Processing **(08 L, 15M)**

1. Introduction to Office Automation Suites
2. Components of MS-Office
3. Features of MS-Office 2010
4. Interface of MS-Word 2010
5. Text Formatting, Paragraph Formatting, Page Formatting
6. Header & Footers, Templates
7. Working with Graphics and Pictures, Symbols ,Working with Tables.
8. Multicolumn News Letter, Smart Art
9. Mail Merge, Printing, Spell Check
10. View, Split, Arrange All

Unit 2: Power Point **(08 L, 10M)**

1. Introduction to Power Point,
2. Basics of Creating Presentations,
3. Applying Themes and Layouts. Working with Objects,
4. Entering, Editing, and Formatting Text ,
5. Inserting Pictures, Graphics, Shapes,
6. Charts and SmartArt, Inserting Tables into Presentations,
7. Adding Sound and Video, Adding Transitions Effects and Animation,
8. Normal view, Slide Sorter view, Running Slide Shows ,Printing slides

Unit 3: Spread sheet-I **(07 L, 10M)**

1. Introduction to Worksheets and Workbooks,
2. Working with Worksheet - Inserting, Deleting, Rename
3. Inserting and Deleting Rows and Columns
4. Format - Row Height, Column Width, Auto-fit, Hide/Unhide

5. Working with Data – Sorting, Filter, Conditional formatting
6. Wrap Text, Merge & Center
7. Page Formatting – Margin, Orientation, Size, Print Area, Break

Unit 4: Spread sheet-II **(07 L, 15M)**

1. Formulas, Inbuilt Functions
2. Basic functions – SUM, COUNT, AVERAGE, MIN, MAX
3. Text functions – UPPER, LOWER, TRIM, LEN
4. Advanced functions: if condition, Remove duplicates

5 . Inserting Images and Graphics,
6. Creating and Working with different types of Charts
7. Printing Worksheets

Reference Books:

- Bittu Kumar , Mastering MS Office:Computer Skill Development –Be Future Ready ,ISBN : SBN-13 978-9350578780, V& S Publishers.
- Cloria Madumere, 3 – IN – 1 Microsoft Word, PowerPoint and Excel 2010, First Edition 2016, Create space Independent Publishing Platform

Course Code: CA 125
Course Title: Practical based on Office Management Tools

Course Code: CA-125	**Course Category: Minor -4** ***For students from other Department/Discipline**
Course Title: Practical based on Office Management Tools	**Type: Practical**
Total Contact Hours: 30	**Course Credits: 02**
College Assessment (CA) Marks:30	**University Assessment (UA): 20**

Course Objectives:

1. To enable the students to study MS Office and to enrich the practical knowledge in MS Office

Course Outcomes:

CO No.	CO	Cognitive level
BCA125C.1	Apply knowledge to perform documentation and presenting skills.	3
BCA125C.2	Proficient in using Windows, Word Processing Applications, Spread sheet Applications, and Presentation Applications	3

Course Content:

1. Create a simple document in word using headings, fonts and paragraph formatting
2. Demonstrate style formatting and page formatting in Word
3. Demonstrate creating and using templates in Word
4. Demonstrate working with pictures and tables in Word
5. Design an invitation letter for your birthday to 10 friends using mail merge.
6. Create presentations and apply themes and layouts to slides in PowerPoint
7. Create presentation using pictures, shapes, tables, charts, Smart Art into slides
8. Demonstrate adding sound, video, transitions, and animation to your PowerPoint presentations.

9. Demonstrate entering data, sorting and formatting data and cells in Excel
10. Demonstrate Formulas in Excel
11. Demonstrate conditional statement in excel
12. Demonstrate SUM, COUNT, AVERAGE, MIN, MAX function in Excel
13. Demonstrate UPPER, LOWER, TRIM, LEN function in Excel
14. Demonstrate types of charts in Excel

Course Code: 126
Course Title: Office Automation Tools

Course Code: CA-126	**Course Category: OE-2** ***For students from other Department/Discipline**
Course Title: Office Automationt Tools	**Type: Theory**
Total Contact Hours: 30	**Course Credits: 02**
College Assessment (CA) Marks:30	**University Assessment (UA): 20**

Course Objectives:

1. To Introduce the fundamental concepts of computers
2. To impart fundamental knowledge on the Word Processing software.
3. To impart basic skill on the Power Point Presentation
4. To impart basic skill on the spread sheet package

Course Outcomes:

CO No.	CO	Cognitive level
BCA126C.1	Be familiar with various office automation tools.	1
BCA126C.2	Apply MS word skills to design and format a document.	3
BCA126C.3	Apply MS word skills to design and analyze data using Excel.	5
BCA126C.4	Create and customize a presentation for a specific topic.	6

Course Content:

Unit :1 Introduction Computer Fundamentals **(07 L, 10 M)**

1. Block diagram of a computer
2. Input and output devices
3. memory and storage devices
4. Types of software
5. Introduction to operating system – functions, types of operating system and examples

Unit :2 Introduction to Office Automation Suites **(08 L, 15 M)**

11. Components of MS-Office
12. Features of MS-Office 2010
13. Interface of MS-Word 2010
14. Text Formatting, Paragraph Formatting, Page Formatting
15. Header & Footers, Templates
16. Working with Graphics and Pictures, Symbols ,Working with Tables.
17. Multicolumn News Letter, Smart Art
18. Mail Merge, Printing, Spell Check
19. View, Split, Arrange All

Unit 3: Power Point **(07 L, 10 M)**

1. Introduction to Power Point,
2. Basics of Creating Presentations,
3. Applying Themes and Layouts. Working with Objects,
4. Entering, Editing, and Formatting Text ,
5. Inserting Pictures, Graphics, Shapes,
6. Charts and SmartArt, Inserting Tables into Presentations,

7. Adding Sound and Video, Adding Transitions Effects and Animation,
8. Normal view, Slide Sorter view, Running Slide Shows ,Printing slides

Unit 4: Spread sheet **(08 L, 15 M)**

1. Introduction to Worksheets and Workbooks,
2. Working with Worksheet - Inserting, Deleting, Rename
3. Inserting and Deleting Rows and Columns
4. Format - Row Height, Column Width, Auto-fit, Hide/Unhide
5. Working with Data – Sorting, Filter, Conditional formatting
6. Wrap Text, Merge & Center
7. Page Formatting – Margin, Orientation, Size, Print Area, Break
8. Formulas, Inbuilt Functions
9. Basic functions – SUM, COUNT, AVERAGE, MIN, MAX
10. Text functions – UPPER, LOWER, TRIM, LEN
11. Advanced functions: if condition, Remove duplicates

Reference Books:

1. Bittu Kumar , Mastering MS Office:Computer Skill Development –Be Future Ready ,ISBN : SBN-13 978-9350578780, V& S Publishers.
2. Cloria Madumere, 3 – IN – 1 Microsoft Word, PowerPoint and Excel 2010, First Edition 2016, Create space Independent Publishing Platform
3. Computer Basics with Office Automation- Archana Kumar, Dreamtech press, First Edition

Course Code: CA-127
Course Title: Computer Assembly and Repair

Course Code: CA-127	**Course Category:** Skill Enhancement Courses **(SEC-2)**
Course Title: Computer Assembly and Repair	**Type: Theory**
Total Contact Hours: 30 (2/week)	**Course Credits: 02**
College Assessment (CA) : 20 Marks	**University Assessment (UA): 30 Marks**

Course Objectives:

1. This course enables the students to understand the fundamentals of PC assembly

Course Outcomes:

CO No.	CO	Cognitive level
BCA127C.1	Student aware with basic Input and Output Unit of computer system.	2
BCA127C.2	Student aware with how to configure motherboard.	2
BCA127C.3	Student aware BIOS configuration.	2
BCA127C.4	Student aware with how to install different operating system.	4

Course Content:

Unit 1: Introduction to PC Hardware: (08 L, 15 M)

1. Understanding of basic components of computer - Input and Output Unit, Memory Type: Static RAM and Dynamic RAM, ROM, PROM, EPROM, EEPROM, Hard disk, Memory card , Pen drive, SMPS.
2. Study of different types of Motherboards, Configuration, Identifying Internal and External connectors, Types of data cables, Types of Processor- Intel Pentium IV, Dual core, Core 2 Duo, Quad processor, core i3,core i5etc.

Unit 2: BIOS Configuration , Installation Operating System (08 L, 10 M)

Study of BIOS Set-up, Boot configuration, Boot Menu., Hard disk partitioning, formatting, Hard disk installation, Installation of Operating System Windows XP/7/10, Linux

Unit 3: Installation of Device Drivers & Configuration of External devices (08 L, 15 M)

Installation of application software, Installation of antivirus software(Quick Heal, Net Protector etc.) , Different types of drivers' installation such as VGA, Audio, LAN, etc., Modem/Internet connection setting, Physical set-up of Printers- Performing test print out, Printing of document, refilling and repairing toner cartridge etc. Scanner set-up, Webcam, Bluetooth/wifi device, etc.

Unit 4: Preventive maintenance and Troubleshooting of PC (06 L, 10M)

Preventative Maintenance, Using Preventative Maintenance Tools (Scandisk, Disk cleanup, Disk defragmentation, Backup etc.) , POST (Power on Self-Test), Identifying common hardware problems (overheating, no power, Boot Failure), Identifying problems by Beep codes errors, Replacement of components etc.

Reference Books:

1. PC Hardware: The Complete Reference, McGraw-Hills, Osborne/McGraw-Hil.
2. The Indispensable PC Hardware Book, Hans-Peter Messmer, Addison-Wesley Professional.
3. PC Hardware: A Beginner's Guide Ron Gilster McGraw-Hill Osborne Media.

Course Code: CA-128
Course Title: Computer Assembly and Repair

Course Code: CA-128	**Course Category:** Skill Enhancement Courses **(SEC-3)**
Course Title: Practical based on Computer Assembly and Repair	**Type: Practical**
Total Contact Hours: 60 (4/week)	**Course Credits: 02**
College Assessment (CA) : 20 Marks	**University Assessment (UA): 30 Marks**

Course Objectives:

1. This course enables the students to understand the fundamentals of PC assembly.
2. It will help them to resolve various issues related with hardware

Course Outcomes:

CO No.	CO	Cognitive level
BCA128C.1	The student will assemble / setup and upgrade personal computer systems; diagnose and isolate faulty components; optimize system performance and install / connect peripherals.	3
BCA128C.2	At the end of course student Understand different types of storage devices like SATA, USB, their purpose and the storage capacity.	2
BCA128C.3	Identify hardware problems using troubleshoot them	4

Course Content:

1. Study of various types of PCs and Laptops (With CPU, Monitor)
2 Study of different input and output devices of computer.
3. Study of primary and secondary memory devices.
4. Study of different processors.
5. Configuration of mother board and connectors.
6. Partitioning of Hard disk and formatting of hard disk
7. Installation of Windows.
8. Installation of Linux.
9. Configuration of External devices-Printer, scanner.
10. Study and configuration of Internet connection -Broadband, Lease line.
11. Study of Preventive maintenance tools
12. Identifying problems using troubleshooting.

Course Code: CC-130
Course Title: Cyber Security

Course Code: CC-130	**Course Category: CC-2**
Course Title: Cyber Security	**Type: Theory**
Total Contact Hours: 30 (2/week)	**Course Credits: 02**
College Assessment (CA) Marks: 50 Marks	**University Assessment (UA): --**

Course Objectives:

- To introduce the student with information security, security threats and attacks
- To study and understand the basic concepts of cryptography and cyber laws.
- To impart the knowledge of cyber-attacks and cyber security among students.
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Course Outcomes:

CO No.	CO	Cognitive level
BCA130C.1	The students will be able to develop basic understanding of cyber security, cryptography, cyber-attacks and defenses against them.	2
BCA130C.2	Enhance and apply the knowledge about cyber laws in general and Regulation of cyber space at national level.	3

Course Content:

Unit 1: Introduction to Cyber Security **(09 L, 10 M)**

Meaning of cyber security, Need and importance of cyber security,
Information Security: Importance of Information Security, Basic Principles of Information Security, Information Security Threats.
Network Security: Network Security- Basic Concepts, Network Security Attacks, Virtual Private Networks: Concept, Types of VPNs and their Usage, Use of Tunnelling with VPN, Intrusion Detection System: Concept and Types of IDS.

Unit 2: Modes of Network Security **(07 L, 13 M)**

Cryptography: concept, Model and Types of Cryptography.
Digital Signature: Meaning &Requirement for Digital Signature System.
Biometrics System: Meaning & Benefits of Biometrics Systems, Criteria for selection of Biometrics.

Unit 3: Cyber Crime **(06 L, 12 M)**

Meaning, Classification of Cyber Crime,
Hacking, Malwares attacks, Phishing, Cyber Terrorism, DoS, Online Scam, Website Defacement,
Identity theft. Protection and prevention against cybercrime.

Unit 4: Cyber Law **(08 L, 15M)**

History Cyber Laws in India, Scope of Cyber Law,
Information Technology Act, 2000: Main features of the IT Act2000, Few Provision related to Offences & Punishment under Information Technology Act, 2000, Information Technology Amendment Act 2008 and its major strengths.

Reference Books:

1. Information Systems Security: Security Management, Metrics, Frameworks and Best Practices, Nina Godbole, 2e, Wiley India Pvt. Ltd.,(ISBN: 978-8126516926)
2.Information Security: Principles and Practice , Merkov, Breithaupt, Pearson Education
(ISBN: 978-0789753250).
3. Foundations of Information Technology, D.S. Yadav, New Age publishers, Delhi,3e, (ISBN 978-8122417623)
4. Cyber Security, Nina Godbole &Sunit Belapure, 2e, Wiley India Pvt. Ltd (ISBN 978-8126521791)
5. Cyber Laws & Information Technology, by Jyoti Rattan, Bharat Law House Pvt Ltd, 8e, (ISBN 978-9386920911)

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