DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY
Chhatrapati Sambhajinagar.

CIRCULAR /SU/CM/NEP UG-IInd Year/52/2024

It is hereby inform to all concerned that, on the recommendation of the Dean, Faculty of Commerce & Management; ***the Hon'ble Vice-Chancellor has accepted the*** **Curriculum of *B.C.A.* Sem. III & IV as per National Education Policy-2020"** ***for concernerd University department*** under the Faculty of Commerce & Management. in his emergency powers under Section 12 [7] of the Maharashtra Public University Act, 2016 on behalf of the Academic Council.

This is effective from the Academic Year 2024-25 and Onwards as per appended herewith.

All concerned are requested to note the contents of this circular and bring notice to the students, teachers and staff for their information and necessary action.

University Campus,
Chhatrapati Sambhajinagar
-431 004.
REF.NO. SU/COM/2024-25/9921-30

Date:- 26-11-2024.

Deputy Registrar,
Academic Section
Syllabus unit.

Copy forwarded with compliments to :-

1] The Head, Department of Management Science,
Dr. Babasaheb Ambedkar Marathwada University.
2] The Director, University Network & Information Centre, UNIC, with **a request to upload this Circular on University Website.**

Copy to :-
1] The Director, Board of Examination & Evaluation,
2] The Section Officer, [Concerned Unit] Examination Branch,
3] The Section officer, [Eligibility Unit],
4] The Programmer [Computer Unit-1] Examinations,
5] The Programmer [Computer Unit-2] Examinations,
6] The In-charge, [E-Suvidha Kendra], Rajarshi Shahu Maharaj Pariksha Bhavan, Dr. Babasaheb Ambedkar Marathwada University.
7] The Public Relation Officer,
8] The Record Keeper.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY CHHATRAPATI SAMBHAJINAGAR

Curriculum of

BCA HONORS

IIIRD TO IV SEMESTER

APPLICABLE FOR DEPARTMENT

under NEP 2020

[Effective from the Academic Year 2024-25 & onwards]

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
Chhatpati Sambhajinagar-431 004 Maharashtra (India)

Department of Management Science

NAAC Re- Accredited 'A'

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Web Site -- :

UNIVERSITY CAMPUS
Chhatpati Sambhajinagar – 431 004
(Maharashtra) INDIA

Dr.Mohd. Farooque Khan
Director

Ref.No.Mgt.Sci/2024-25/274 **Date:- -24/10/2024**

Dr. Babasaheb Ambedkar Marathwada University Academic Section Inward 1852 25/10/24 Chhatrapati Sambhajinagar

To,
The Deputy Registrar,
Academic Section
Dr. Babasaheb Ambedkar Marathwada University,
Chhatrapati Sambhajinagar.

Subject: - Regarding Submission of Syllabus of BCA Honours (Four Year) Course as per NEP -2020.

Sir,

With reference to the above cited subject, I am to inform you that as per the meeting of Departmental committee, I am herewith submitting the Course Structure of the BCA Honours Programme as per NEP -2020.

In this regards, please make a necessary provision in University Examination Software for above mentioned course.Further, we would like to implement the syllabus for the batch of BCA Honours for the academic year 2024-2025.

This is for your information and further necessary action.

Thanking you,

Dr. Babasaheb Ambedkar Marathwada University Department of Management Science Chhatrapati Sambhajinagar

Dr. Mohd.Farooque Khan
Director

I.D. 186631
TYK. 853478

Encl: 1) BCA Honours Syllabus Copy

Dr. Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhaji Nagar.

Faculty of Commerce & Management

Bachelor of Computer Applications (Honours)

BCA Program Structure & Syllabus

As per NEP-2020

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

2024-25

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
Faculty of Management Science
Curriculum Structure
Bachelor of Computer Applications (BCA) Honours
Academic Year 2023-2024

Semester -I

Course Type	Course Code	Course Tile	Total Lectures (Teaching Lectures /week)	Credits	Scheme of Examination			
					Max Marks	UA	IA	Min Marks
	DSC : Discipline Specific Core							
DSC -1	BCA101T	Computer Fundamentals	45 (03/per week)	02	50	30	20	20
DSC -2	BCA102T	Operating System	45 (03/per week)	02	50	30	20	20
DSC 1&2	BCA103P	Lab based on CF & OS	45 (03/per week)	02	50	30	20	20
GE : Generic Elective (Choose any one)								
GE /OE-1	BCA104T	**A]** Digital Electronics	45 (03/per week)	02	50	30	20	20
		B]Principles of Marketing	45 (03/per week)	02	50	30	20	20
		C] Fundamentals of Accounting	45 (03/per week)	02	50	30	20	20
	OE : Open Elective (Choose any one)							
GE /OE-1	BCA105T	**A]** Web Development Technology	45 (03/per week)	02	50	30	20	20
		B] Programming Methodology	45 (03/per week)	02	50	30	20	20
		C] Internet Technology	45 (03/per week)	02	50	30	20	20
	VSC : Vocational Skill Course (Choose any one)							
VSC1	BCA106P	**A]** Ms-Office	45 (03/per week)	02	50	30	20	20
		B] Unix	45 (03/per week)	02	50	30	20	20
		C] Linux	45 (03/per week)	02	50	30	20	20
	SEC : Skill Enhancement Course (Choose any one)							
SEC-1	BCA107P	**A]** MS-Power BI	45 (03/per week)	02	50	30	20	20
		B] Web Development Technology using HTML Lab	45 (03/per week)	02	50	30	20	20
		C] Introduction to Tally	45 (03/per week)	02	50	30	20	20
	AEC : Ability Enhancement Course (Choose any one)							
AEC1	BCA108T	English	45 (03/per week)	02	50	30	20	20

	VEC : Value Education Course (Choose any one)							
VEC1	BCA109T	Indian Constitution	45 (03/per week)	02	50	30	20	20
	IKS : Indian Knowledge System (Choose any one)							
IKS	BCA110P	Preservation of Himroo Weaving Design Patterns of Paithani /Historical Heritage / Study of Regional Language / History of Marathwada / KhadiGramudyog /International Trade in Ancient India	45 (03/per week)	02	50	--	50	20
	CC : Co-curricular Course							
CC1	BCA111P	Health & Wellness	45 (03/per week)	02	50	--	50	20
				22	**550**			

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
Faculty of Management Science
Curriculum Structure
Bachelor of Computer Applications (BCA) Honours
Academic Year 2023-2024

Semester -II

Course Type	Course Code	Course Tile	Total Lectures (Teaching Lectures /week)	Credits	Scheme of Examination			
					Max Marks	UA	IA	Min Marks
	DSC : Discipline Specific Core							
DSC-3	BCA201T	DBMS	45 (03/per week)	02	50	30	20	20
DSC -4	BCA202T	C programming	45 (03/per week)	02	50	30	20	20
DSC 3&4	BCA203P	Lab based on DBMS & C programming	45 (03/per week)	02	50	30	20	20
	Minor							
M1	BCA204T	Discrete Mathematics	45 (03/per week)	02	50	30	20	20
	GE : Generic Elective (Choose any one)							
GE/OE-3	BCA205T	**A]** Basics of Electronics	45 (03/per week)	02	50	30	20	20
		B] Business Organisation	45 (03/per week)	02	50	30	20	20
		C] Fundamentals of Banking	45 (03/per week)	02	50	30	20	20
	OE C]: Open Elective (Choose any one)							
GE/OE-4	BCA206T	**A]** Advance Web Development Technology	45 (03/per week)	02	50	30	20	20
		B] System Analysis & Design	45 (03/per week)	02	50	30	20	20
		C] Digital Marketing	45 (03/per week)	02	50	30	20	20
	VSC : Vocational Skill Course (Choose any one)							
VSC2	BCA207P	**A]** Basic of Electronics Lab	45 (03/per week)	02	50	30	20	20
		B] Data Analysis Using MS-Excel	45 (03/per week)	02	50	30	20	20
		C] Analysis of Balance Sheet	45 (03/per week)	02	50	30	20	20
	SEC : Skill Enhancement Course (Choose any one)							
SEC2	BCA208P	**A]** Advance Web Development Technology Lab	45 (03/per week)	02	50	30	20	20
		B] System Analysis & Design -Lab	45 (03/per week)	02	50	30	20	20

		C]Digital Marketing -Lab	45 (03/per week)	02	50	30	20	20
	AEC : Ability Enhancement Course (Choose any one – Modern Indian Language)							
AEC2	BCA209T	Hindi / Marathi / Urdu / Arabic / Sanskrit /Pali	45 (03/per week)	02	50	30	20	20
	VEC : Value Education Course							
VEC2	BCA210T	Environment Studies	45 (03/per week)	02	50	30	20	20
	BCA204T CC : Co-curricular Course (Choose any one)							
CC2	BCA211P	**A]** Yoga Education	45 (03/per week)	02	50	--	50	20
		B] Sports & Fitness	45 (03/per week)	02	50	--	50	20
				22	**550**			

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
Faculty of Management Science
Curriculum Structure
Bachelor of Computer Applications (BCA) Honours
Academic Year 2023-2024

Semester -III

Course Type	Course Code	Course Tile	Total Lectures (Teaching Lectures /week)	Credits	Scheme of Examination			
					Max Marks	UA	IA	Min Marks
	DSC : Discipline Specific Core							
DSC-5	BCA301T	OOPS using C++	45 (03/per week)	02	50	30	20	20
	BCA302P	OOPS using C++ Lab	45 (03/per week)	02	50	30	20	20
DSC-6	BCA303T	Advance Database Management	45 (03/per week)	02	50	30	20	20
	BCA304P	Advance Database Management-Lab	45 (03/per week)	02	50	30	20	20
	Minor							
M2	BCA305T	Statistics	45 (03/per week)	02	50	30	20	20
	BCA306T	Mathematics	45 (03/per week)	02	50	30	20	20
GE/OE -5	**GE / OE : Generic Elective / Open Elective (Choose any one)**							
	BCA307T	**A]** Computer Networking	45 (03/per week)	02	50	30	20	20
		B] Microcontroller	45 (03/per week)	02	50	30	20	20
		C] Computer Hardware	45 (03/per week)	02	50	30	20	20
	Select any one Lab with respect to selection of any one GE / OE from the above							
	BCA308P	**A]** Computer Networking -Lab	45 (03/per week)	02	50	30	20	20
		B] Microcontroller-Lab	45 (03/per week)	02	50	30	20	20
		C] Computer Hardware-Lab	45 (03/per week)	02	50	30	20	20
VSC-3	**VSC : Vocational Skill Course (Choose any one)**							
	BCA309P	**A]** Java Script Lab	45 (03/per week)	02	50	30	20	20
		B] Oracle Lab	45 (03/per week)	02	50	30	20	20
		C] XML Lab	45 (03/per week)	02	50	30	20	20
	AEC : Ability Enhancement Course (Choose any one – Modern Indian Languages)							
AEC-3	BCA310T	Hindi / Marathi / Urdu / Arabic / Sanskrit / Pali/ English	45 (03/per week)	02	50	30	20	20
	FP : Field Project							

FP1	BCA311P	Field Project	45 (03/per week)	02	50	--	50	20
	OR (Select either FP1 or CC3)							
	CC : Co-curriculum Course							
CC3	BCA311P	Cultural Activity / NSS / NCC	45 (03/per week)	02	50	--	50	20
				22	**550**			

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
Faculty of Management Science
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Bachelor of Computer Applications (BCA) Honours
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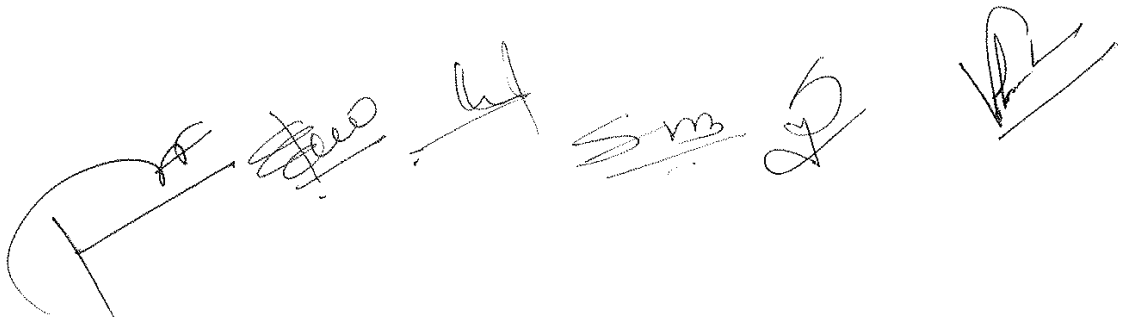
Semester -IV

Course Type	Course Code	Course Tile	Total Lectures (Teaching Lectures /week))	Credits	Scheme of Examination			
					Max Marks	UA	IA	Min Marks
	DSC : Discipline Specific Core							
DSC-7	BCA-401T	Data Structure Using C	45 (03/per week)	02	50	30	20	20
	BCA402P	Data Structure Using C-Lab	45 (03/per week)	02	50	30	20	20
DSC-8	BCA403T	ASP.Net	45 (03/per week)	02	50	30	20	20
	BCA404P	ASP.Net -Lab	45 (03/per week)	02	50	30	20	20
	Minor							
M3	BCA405T	Python	45 (03/per week)	02	50	30	20	20
	BCA406P	Python - Lab	45 (03/per week)	02	50	30	20	20
GE4/OE4	**GE/OE : Generic Elective / Open Elective (Choose any one)**							
	BCA407T	**A]** SPSS	45 (03/per week)	02	50	30	20	20
		B] Creativity & Innovation	45 (03/per week)	02	50	30	20	20
		C] Cyber Security	45 (03/per week)	02	50	30	20	20
	Select any one Lab with respect to selection of any one GE / OE from the above							
	BCA408P	**A]** SPSS - Lab	45 (03/per week)	02	50	30	20	20
		B] Creativity & Innovation -Practical	45 (03/per week)	02	50	30	20	20
		C] Cyber Security - Lab	45 (03/per week)	02	50	30	20	20
SEC-3	**SEC : Skill Enhancement Course (Choose any one)**							
	BCA409T	**A]** Quantitative Aptitude	45 (03/per week)	02	50	30	20	20
		B] Business Communication	45 (03/per week)	02	50	30	20	20
		C] Life Skills	45 (03/per week)	02	50	30	20	20
	AEC : Ability Enhancement Course (Choose any one)							
AEC4	BCA410T	Modern Indian Languages. Choose any one from available	45 (03/per week)	02	50	30	20	20

		Indian Language Hindi / Marathi / Urdu / Arabic / Sanskrit / Pali / English						
	CEP : Community Engagement Project or Co-curriculum Course							
CEP	BCA411T	Community Engagement Project	45 (03/per week)	02	50	--	50	20
OR (Select either CEP or CC4)								
CC4	BCA411T	NSS / NCC/ Fine / Applied / Visual / Performing Arts	45 (03/per week)	02	50	--	50	20
				22	**550**			



Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
Faculty of Management Science
Curriculum Structure
Bachelor of Computer Applications (BCA) Honours
Academic Year 2023-2024

Semester -V

Course Type	Course Code	Course Tile	Total Lectures (Teaching Lectures /week)	Credits	Scheme of Examination			
					Max Marks	UA	IA	Min Marks
	DSC : Discipline Specific Core							
DSC-9	BCA501T	Java Programming	45 (03/per week)	02	50	30	20	20
	BCA502P	Java Programming - Lab	45 (03/per week)	02	50	30	20	20
DSC-10	BCA503T	Software Engineering	45 (03/per week)	01	50	30	20	20
	BCA504P	Software Engineering -Lab	45 (03/per week)	01	50	30	20	20
	DSE : Discipline Specific Elective							
DSE-1	BCA505T	**A]**Advance Java	45 (03/per week)	01	50	30	20	20
		B]C#	45 (03/per week)	01	50	30	20	20
		C]Web Development using PHP	45 (03/per week)	01	50	30	20	20
	Select any one Lab with respect to selection of any one DSE from the above							
	BCA506P	**A]**Advance Java -Lab	45 (03/per week)	01	50	30	20	20
		B]C#-Lab	45 (03/per week)	01	50	30	20	20
		C]Web Development using PHP-Lab	45 (03/per week)	01	50	30	20	20
	Minor							
M5	BCA507T	Android	45 (03/per week)	02	50	30	20	20
	BCA508P	Android-Lab	45 (03/per week)	02	50	30	20	20
VSC-4	**VSC : Vocational Skill Course (Choose any one)**							
	BCA509T	**A]**Sensors Technology	45 (03/per week)	02	50	30	20	20
		B]Entrepreneurship	45 (03/per week)	02	50	30	20	20
		C]Image Processing	45 (03/per week)	02	50	30	20	20
	Select any one Lab with respect to selection of any one VSC from the above							
	BCA510P	**A]**Sensors Technology -Lab	45 (03/per week)	02	50	30	20	20
		B]Entrepreneurship - Lab	45 (03/per week)	02	50	30	20	20

		C]Image Processing-Lab	45 (03/per week)	02	50	30	20	20
	FP : Field Project							
FP2	BCA511P	Field Project	45 (03/per week)	02	50	--	50	20
OR (Select either FP2 or CEP)								
CEP	BCA511P	Community Engagement Project	45 (03/per week)	02	50	--	50	20
				22	**550**			

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
Faculty of Management Science
Curriculum Structure
Bachelor of Computer Applications (BCA) Honours
Academic Year 2023-2024

Semester -VI

Course Type	Course Code	Course Tile	Total Lectures (Teaching Lectures /week)	Credits	Scheme of Examination			
					Max Marks	UA	IA	Min Marks
	DSC : Discipline Specific Core							
DSC-11	BCA601T	Internet of Things (IoT)	45 (03/per week)	02	50	30	20	20
	BCA602P	Internet of Things (IoT) - Lab	45 (03/per week)	02	50	30	20	20
DSC-12	BCA603T	Software Testing	45 (03/per week)	01	50	30	20	20
	BCA604P	Software Testing - Lab	45 (03/per week)	01	50	30	20	20
DSC-13	BCA605T	Software Project Management(SPM)	45 (03/per week)	01	50	30	20	20
	DSE : Discipline Specific Elective (Choose any one)							
DSE-2	BCA606T	**A]** Java Server Page (JSP)	45 (03/per week)	01	50	30	20	20
		B] Geographic information System(GIS)	45 (03/per week)	01	50	30	20	20
		C] Data Warehousing & Data Mining	45 (03/per week)	01	50	30	20	20
	Select any one Lab with respect to selection of any one DSE from the above							
	BCA607P	**A]** Java Server Page (JSP) -Lab	45 (03/per week)	01	50	30	20	20
		B] Geographic information System(GIS) -Lab	45 (03/per week)	01	50	30	20	20
		C] Data Warehousing & Data Mining -Lab	45 (03/per week)	01	50	30	20	20
	Minor							
M5	BCA608T	Android Application Development	45 (03/per week)	02	50	30	20	20
	BCA609P	Android Application Development - Lab	45 (03/per week)	02	50	30	20	20
	OJT : On Job Training							
OJT -1	BCA610P	On Job Training -1	90 (06/per week)	04	100	60	40	40
				22	**550**			

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
Faculty of Management Science
Curriculum Structure
Bachelor of Computer Applications (BCA) Honours
Academic Year 2023-2024

Semester -VII

Course Type	Course Code	Course Tile	Total Lectures (Teaching Lectures /week)	Credits	Scheme of Examination			
					Max Marks	UA	IA	Min Marks
	DSC : Discipline Specific Core							
DSC-14	BCA701T	Cloud Computing	45 (03/per week)	02	50	30	20	20
	BCA702P	Cloud Computing-Lab	45 (03/per week)	02	50	30	20	20
DSC-15	BCA703T	Artificial Intelligence	45 (03/per week)	01	50	30	20	20
	BCA704P	Artificial Intelligence-Lab	45 (03/per week)	01	50	30	20	20
DSC-16	BCA705T	Design and Analysis of Algorithms	45 (03/per week)	02	50	30	20	20
	BCA706P	Design and Analysis of Algorithms-Lab	45 (03/per week)	02	50	30	20	20
DSC-17	BCA707T	Theory of Computation	45 (03/per week)	02	50	30	20	20
	DSE : Discipline Specific Elective (Choose any one)							
DSE-3	BCA708T	A] Hibernate	45 (03/per week)	02	50	30	20	20
		B] Multimedia	45 (03/per week)	02	50	30	20	20
		C] E-Commerce	45 (03/per week)	02	50	30	20	20
	Select any one Lab with respect to selection of any one DSE from the above							
	BCA709P	**A]** Hibernate -Lab	45 (03/per week)	02	50	30	20	20
		B] Multimedia - Lab	45 (03/per week)	02	50	30	20	20
		C] E-Commerce - Lab	45 (03/per week)	02	50	30	20	20
	Minor							
M6	BCA710T	Research Methodology	45 (03/per week)	02	50	30	20	20
	BCA711P	Research Methodology -Lab	45 (03/per week)	02	50	30	20	20
				22	**550**			

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
Faculty of Management Science
Curriculum Structure
Bachelor of Computer Applications (BCA) Honours
Academic Year 2023-2024

Semester -VIII

Course Type	Course Code	Course Tile	Total Lectures (Teaching Lectures /week)	Credits	Scheme of Examination			
					Max Marks	UA	IA	Min Marks
	DSC : Discipline Specific Core							
DSC-18	BCA801T	Block Chain Technology	45 (03/per week)	02	50	30	20	20
	BCA802P	Block Chain Technology -Lab	45 (03/per week)	02	50	30	20	20
DSC-19	BCA803T	Data Science using Python	45 (03/per week)	02	50	30	20	20
	BCA804P	Data Science using Python-Lab	45 (03/per week)	02	50	30	20	20
DSC-20	BCA805T	Big Data	45 (03/per week)	02	50	30	20	20
	BCA806P	Big Data-Lab	45 (03/per week)	02	50	30	20	20
DSC-21	BCA807T	Principles of Management	45 (03/per week)	02	50	30	20	20
	DSE : Discipline Specific Elective (Choose any one)							
DSE-4	BCA808T	**A]**Amazon Web Service (AWS)	45 (03/per week)	02	50	30	20	20
		B]Machine Learning	45 (03/per week)	02	50	30	20	20
		C]R-programming	45 (03/per week)	02	50	30	20	20
	Select any one Lab with respect to selection of any one DSE from the above							
	BCA809P	**A]**Amazon Web Service (AWS) -Lab	45 (03/per week)	02	50	30	20	20
		B]Machine Learning -Lab	45 (03/per week)	02	50	30	20	20
		C]R-programming -Lab	45 (03/per week)	02	50	30	20	20
	OJT : On Job Training							
OJT-2	BCA810T	On Job Training -3	90 (06/per week)	04	100	60	40	40
				22	**550**			

Dr. Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhaji Nagar.

Faculty of Commerce & Management

Bachelor of Computer Applications (Honours)

BCA Program Structure & Syllabus

As per NEP-2020

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

2024-25

Dr.Babasaheb Ambedkar Marathwada University
Aurangabad
Bachelor of Computer Application (BCA)- Honours
Syllabus
Academic Year 2023 - 24
Semester - III

Discipline Specific Core (DSC-5)

Subject Title		**Object Oriented Programming using C++**		
Subject Ref. No.		**BCA301T**	**No. of Credits**	2
			No. of Periods / Week	45 / 3
			Assignments / Sessional	20
			Semester Examination	30

Course Objectives

The objectives of the course are to enhance the ability of the students in Object Oriented Programming and practice the object-orientedprogramming concepts and techniques, practice the use of C++ classes and Objects. Smooth handling of Multiple and Multilevel Inheritance. Understanding of dynamic binding, use of Inline and Friend Functions, Polymorphism, and file I/O streams.

1)	To enhance the advance concepts of Object Oriented Programming
2)	To provide the knowledge of classes and Object for Data hiding
3)	To understand importance of various functions and their uses
4)	To develop skills to apply appropriate uses of Inheritance, exception and file handling

Pre Requisite	Basic knowledge of C programming	**Number of Lecture**
Unit – I	**Principles of Object Oriented Programming (OOP):** Introduction to OOP, Difference between OOP and Procedure Oriented Programming; Concepts: Object, Class, Encapsulation, Abstraction, Polymorphism and Inheritance, Applications of OOP. Special operators: scope resolution operator, Member Dereferencing operators, Memory management operators, Manipulators and Type cast operator	**10**
Unit – II	**Structure of a C++ Program and Classes and Objects :** Class Declaration : Data	**10**

	Members, Member Functions, Private and Public members, Creating Objects, Accessing class data members, Accessing member functions; Class Function Definition: Member Function definition inside the class declaration and outside the class declaration.	
Unit – III	**Functions:** Friend function, inline function, Static members, Function Overloading, Arrays within a class. Arrays of Objects; Objects as function arguments: Pass by value, Pass by reference, Pointers to Objects. Constructors: Declaration and Definition, Types of Constructors, (Default, Parameterized, Copy Constructors). Destructors: Definition and use. Operator Overloading & Type Conversion: Conversion from basic type to user defined type, User defined to basic type and one user defined conversion to another user defined type.	**10**
Unit – IV	**Inheritance:** Extending Classes Concept of inheritance, Base class, Defining derived classes, Visibility modes : Public, Private, Protected ;Types of Inheritance: Single inheritance : Privately derived, Publicly derived; Making a protected member inheritable, multilevel inheritance, multiple Inheritance and ambiguity of multiple inheritance, Hierarchal Inheritance, Hybrid, Nesting of classes. Polymorphism: Definition, Application and demonstration of Data Abstraction, Encapsulation and Polymorphism. Early Binding, Polymorphism with pointers, Virtual Functions, Late binding, pure virtual functions.	**08**
Unit – V	**Exception Handling:** Definition, Exception Handling Mechanism : Throwing mechanism and Catching Mechanism, Rethrowing an Exception **File Processing :** Opening and closing of file, Binary file operations, structures and file operations, classes and file operations, Random file processing.	**07**
	Total Lectures	**45**
Text Books	1.E. Balaguruswamy, : Object Oriented Programming with C++, 2.Bjarne Stroustrup: The C++ programming language. 3.Object Oriented Programming & C++, R. Rajaram,New Age International	
Additional Reference Books	1. Object Oriented Programming & C++, R. Rajaram,New Age International. 2. Robert Lafore, 2003 : Object Oriented Programming in Turbo C++, Galgotia Pub. 3. Salaria, R. S. : Object Oriented Programming Using C++, Khanna Book Publishing Co. (P.) Ltd., New Delhi.	
Website	1. https://www.w3schools.com/cpp/ 2.https://www.tutorialspoint.com/cplusplus/index.htm 3. https://www.geeksforgeeks.org/c-plus-plus/	

Subject Title		Object Oriented Programming using C++ Lab		
Subject Ref. No.		BCA-302P	No. of Credits	2
			No. of Periods / Week	45 / 3
			Assignments / Sessional	20
			Semester Examination	30

Course Outcomes

1)	Ability to develop applications for a range of problems using object-oriented programming techniques
2)	Enhancing Programming Skill by using Object, Classes and functions.
3)	Understanding Single, multiple and Multi level Inheritance and creating real events.
4)	To develop real life Applications by extracting deep level of C++.

Pre Requisite	Basic knowledge of C programming	Number of Lecture
	1. WAP program in C++ which will display the book information which include the following: a) Title of the book b) Author name c) publisher name d) edition 5) price 2. WAP program in C++ to swap two numbers using Call by Value Call by Reference. 3. WAP program in C++ to demonstrate switch statement. 4. WAP program in C++ to convert binary number to decimal number 5. WAP program in C++ to print multiplication table of a given number. 6. WAP program in C++ to find prime numbers up to n values (n must be user defined). 7. WAP program in C++to find factorial of a given number. 8. WAP program in C++ to find addition of two given numbers using inline function 9. WAP program in C++to find Max and Min of two given numbers using inline functions. 10. WAP program in C++ to illustrate use of friend functions. 11. WAP program in C++ to illustrate use of virtual functions. 12. WAP program in C++ to illustrate use of exception handling. 13. WAP program in C++ to declare a class. Declare pointer to class. Initialize and display the contents of the class member 14. WAP program in C++ to create an EMPLOYEE class contains following members: data members: Employee number, Employee name, Basic, DA, IT, Net Salary and print data members 15. WAP program in C++ to create single level inheritance.	

	16. WAP program in C++ to implements multi-level inheritance 17. WAP program in C++ to implements multiple-inheritance. 18. WAP program in C++ to illustrate use of function overloading. (Write a C++ program to find areas of different shapes (square, rectangle and triangle)). 19. WAP program in C++ to illustrate use of operator overloading. (Write a C++ program to perform various arithmetic operations on two complex numbers). 20. WAP program in C++ to illustrate the concepts of console I/O operations. 21. WAP program in C++ to allocate memory using new operator. 22. WAP program in C++ to create an array of pointers. Invoke functions using array objects. 23. WAP program in C++ to use pointer for both base and derived classes and call the member function. Use Virtual keyword. 24. WAP program in C++ to write the content in a file and to read content in the file. 25. WAP program in C++ to implement single file handling program to reading and writing data on a file.	
Text Books	1. The Complete Reference C++ 4th edition by Schildt. 2. The design and Evolution of C++ by Bjarne Straoustrup 3. Learn To Program with C++ John Smiley	
Additional Reference Books	1. A complete guide to Programming in C++ by Ulla Kirch-Prinz 2. Let us C++ by Yashwant Kanitkar.	
Website	1.https://www.w3schools.com/cpp/ 2.https://www.javatpoint.com/cpp-tutorial	

Discipline Specific Core (DSC-6)

Subject Title		**Advance Database Management**			
Subject Ref. No.		**BCA303T**	**No. of Credits**		2
			No. of Periods / Week		45 / 3
			Assignments / Sessional		20
			Semester Examination		30

Course Objectives

1)	To develop a deep understanding of advanced database management system concepts, including relational and non-relational database models, to manage and manipulate large sets of data effectively.
2)	To impart knowledge on advanced relational database design techniques, normalization processes, and optimization strategies for efficient database management and querying.
3)	To enhance proficiency in writing complex SQL queries
4)	To provide insights into transaction management, concurrency control mechanisms, and techniques to ensure data consistency, integrity, and handling of deadlocks in multi-user environments.

Pre Requisite	DBMS	**Number of Lecture**
Unit – I	**Introduction to Database Management Systems** • Review of basic DBMS concepts • Database architecture • Data models: Hierarchical, Network, Relational, Object-oriented	**09**
Unit – II	**Relational Database Design** • Functional dependencies and normalization • Normal forms (1NF, 2NF, 3NF, BCNF) • Decomposition and synthesis approaches • Multivalued dependencies and 4NF • Join dependencies and 5NF	**09**

Unit – III	**SQL and Advanced SQL** • Review of basic SQL, DML, DDL, DCL, TCL • Advanced SQL queries: Nested queries, joins, subqueries	**15**
Unit – IV	**Transaction Management and Concurrency Control** • Transactions and ACID properties • Concurrency control techniques: Lock-based protocols, timestamp-based protocols	**06**
Unit – V	**Deadlock** ☐ Deadlock handling: Prevention, detection, and recovery ☐ Serializability and recoverability	**06**
	Total Lectures	**45**
Text Books	1. Elmasri, R., & Navathe, S. B. (2015). *Fundamentals of Database Systems*. Pearson. 2. Silberschatz, A., Korth, H. F., & Sudarshan, S. (2019). *Database System Concepts*. McGraw-Hill Education.	
Additional Reference Books	1. Ullman, J. D., & Widom, J. (2008). *A First Course in Database Systems*. Pearson. 2. Date, C. J. (2003). *An Introduction to Database Systems*. Addison-Wesley. 3. Connolly, T., & Begg, C. (2014). *Database Systems: A Practical Approach to Design, Implementation, and Management*. Pearson.	

Subject Title		Advance Database Management -Lab			
Subject Ref. No.		BCA-304P	No. of Credits		2
			No. of Periods / Week		45 / 3
			Assignments / Sessional		20
			Semester Examination		30

Course Objectives

1)	To equip students with the skills to create, modify, and manage database structures using DDL commands, ensuring proper data organization and integrity within relational databases.
2)	To develop the ability to perform basic data manipulation operations, including inserting, updating, deleting, and retrieving data from databases using DML commands.
3)	To enhance students' ability to perform complex data retrieval operations using advanced SQL features such as joins, subqueries, aggregate functions, and set operations, enabling efficient data analysis and reporting.
4)	To provide an understanding of transaction control mechanisms, ensuring data consistency and integrity, and to introduce basic security measures for managing database access and permissions.

Pre Requisite	NA	Number of Lecture - 45

LAB Assignment

- **Creating Databases and Tables**:
  - SQL commands: CREATE DATABASE, CREATE TABLE
  - Specifying data types and constraints
  - Primary keys, foreign keys, and indexes
- **Altering and Dropping**:
  - ALTER TABLE statement (adding, modifying, and deleting columns)
  - DROP TABLE and DROP DATABASE commands
- **Constraints and Integrity**:
  - NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY, CHECK constraints

- Enforcing data integrity

- **Basic DML Operations**:
  - INSERT INTO statement for adding data
  - UPDATE statement for modifying data
  - DELETE statement for removing data
- **Retrieving Data with SELECT**:
  - Basic SELECT statement
  - Using WHERE clause for filtering
  - ORDER BY clause for sorting results
  - LIMIT and OFFSET for pagination

Text Books	1. *Murach's SQL Server 2019 for Developers*. Mike Murach & Associates. 2. *SQL Cookbook*. O'Reilly Media.	
Additional Reference Books	3. *SQL in a Nutshell: A Desktop Quick Reference*. O'Reilly Media.	

Discipline Specific Core-(Minor) M2

Subject Title		**Statistics**		
Subject Ref. No.		**BCA305T**	**No. of Credits**	2
			No. of Periods / Week	45 /3
			Assignments / Sessional	20
			Semester Examination	30

Course Objectives

1)	To demonstrate knowledge of various statistical data analysis tools.
2)	To demonstrate knowledge of statistical investigation, classification, tabulation, diagrammatic and graphic presentation of data.
3)	To demonstrate the ability to calculate measures of location and measures of dispersion grouped and ungrouped data cases.
4)	To demonstrate the ability to perform complex data management and analysis.

Course Outcomes (COs)

At the end of the course, students will be able to:

CO-1	Describe and discuss the key terminology, concepts tools and techniques used in statistics.
CO-2	Critically evaluate the underlying assumptions of analysis tools.
CO-3	Understand and critically discuss the issues surrounding sampling and significance.
CO-4	Conduct basic statistical analysis of data.

Pre-Requisite		Basic knowledge of Mathematics and Algebra	**Number of Lecture**
Unit – I		**Introduction to statistics** Definition, features, functions, importance and limitations.	**5**
Unit – II		**Statistical investigation** Concept, planning, types of enquiry, collection of data, drafting the questionnaire, sources of secondary data, editing primary and secondary data. **Sampling and sample designs** Introduction, census and sample method, theoretical basis of sampling,	**10**

		methods of sampling, size of the sample, sampling and non-sampling errors.	
Unit – III		**Classification and tabulation of data** Meaning, objective, types of classification, formation of various frequency distribution, tabulation of data, role of tabulation, parts of table, general rules of tabulation. **Diagrammatic and graphic presentation of data** Significance of diagrams and graphs, rules of constructing diagrams, types of diagrams, graphs, graphs of frequency distribution.	**10**
Unit – IV		**Measures of central tendency and measures of dispersion** Definition, essentials of a good average, types of averages i.e. mean ,median and mode, relation between mean ,median and mode. Measures of dispersion i..e. range, quartile deviation, mean deviation, standard deviation for grouped and ungrouped data and also coefficient of variation.	**10**
Unit – V		**Correlation analysis and Regression analysis** Definition , significance of study of correlation, types, Karl-person's coefficient of correlation, interpreting coefficient of correlation, definition of regression ,uses of regression analysis, two regression equations, simple problems only	**10**
		Total Lectures	**45**
Text Books		1. S. P . Gupta," Statistical Methods" S. . Chand and Sons, New Delhi, 2008 2. S.C. Gupta , "Fundamental of Statistics" Himalaya Publishing House, New Delhi, 2004. 3. Sharmar .J.K. "Business Statistics" Pearson Education, 2007.	
Additional Reference Books		1. S.C. Gupta & Indra Gupta " Business Statistics" Himalaya Publishing House, 2012. 2. C. Satyadevi, "Quantitative Techniques" S. Chand & Company Ltd, 2009. 3. Arora. P.N. Arora, Sumeet &Arora Amit "Managerial Statistics " S. Chand & Sons , 2009.	

Subject Title		Mathematics (Numerical Methods)		
Subject Ref. No.		BCA306T	No. of Credits	2
			No. of Periods / Week	45 /3
			Assignments / Sessional	20
			Semester Examination	30

Course Objectives

1)	To understand the importance of error analysis and their propagation.
2)	To introduce the basic concepts of solving algebraic, transcendental equation and system of non-linear equations.
3)	To understand techniques of interpolation and polynomial fitting.
4)	To understand methods of numerical differentiation, integration and solution of ordinary differential equations.

Course Outcomes (COs)

At the end of the course, students will be able to:

CO-1	Calculate errors induced in the values by truncation of a series expansion.
CO-2	Find roots of linear and non-linear system (algebraic and transcendental) equations
CO-3	Fit polynomial to a given set of data points.
CO-4	Solve differential and integral equations numerically.

Pre-Requisite		Basic knowledge of Mathematics and Algebra	Number of Lecture
Unit – I		**Numbers and their accuracy. Errors and their computations -Absolute, Relative and percentage. Solution of Non-linear and transcendental equations Bisection method, method of False position and Newton-Raphson method.**	7
Unit – II		**Solution of linear simultaneous equations. Gauss-Elimination method, Gauss-Jordan method and Gauss-Seidal iterative method.**	8
Unit – III		**Interpolation. Lagrange's interpolation, Finite difference, Forward, Backward and Central, Newton's formulae for Forward, Backward and Central interpolation**	10

Unit – IV		**Regression Analysis, Linear regression, polynomial regression. Fitting an exponential curve and Hyperbolic regression**	8
Unit – V		**Numerical differentiation and integration, derivative using Newton's forward and backward difference formulae , Stirling formula ,Numerical integration-Trapezoidal rule, Simpson's 1/3rule ,Simpson's 3/8 rule ,Numerical solution of ordinary differential equations, solution by Taylor's series ,Euler's method, modified Euler's method ,Runge-Kutta method of 2^{nd} and 4^{th} order**	12
Text Books		1. V. Rajaraman "Computer oriented numerical methods" (third edition)1993 2. S. S. Shastri "Introductory methods of numerical analysis" Vol-2 PHI, second edition	
Additional Reference Books		1. V .N. Vedamurthy "Numerical methods "Vikas Publishing House, . New Delhi2005 2. B.S.Grewal " Numerical methods in Engineering &Science, Khanna Publishers,Delhi2005	

GE / OE : Generic Elective / Open Elective (Choose any one)

Subject Title		**[A] Computer Networking**		
Subject Ref. No.		**BCA 307T**	**No. of Credits**	2
			No. of theory/ per Week	45/03
			Assignments / Sessional	20
			Semester Examination	30

Course Objectives

1) To understand the concept of Computer network
2) To impart knowledge about networking and internet working devices
3) To understand the different transmission media & Network Topology
4) To understand the concept of modulation & Multiplexing Technique

Course Outcomes (COs)

CO-1	**Design & Implement of computer network.**
CO-2	Configure wire & wireless Network.
CO-3	Implement TCP/IP Protocols.
CO-4	Installation of different Operating System.

		Number of Lecture
Unit – I	**Introduction,** Data Communication, components, Computer network Advantage and applications, simplex, half-duplex, and full-duplex, Types of connections: point-to-point and multipoint, topology, Categories of Networks LAN , MAN & WAN, Analog and Digital Data, Transmission Modes, Parallel Transmission, serial Transmission , Asynchronous & Asynchronous serial Transmission	**15**

	Reference models: TCP/IP Protocol Suite: The OSI Model **Connecting devices** Hub, Repeaters, Bridges, switches & Routers, Media Access Control (MAC), Standard Ethernet,	
Unit – II	**Transmission Media** Guided media include twisted-pair cable, coaxial cable, and fiber-optic cable. Unguided medium, Radio Waves, Microwaves & Infrared waves. **Switching Networks** Circuit-switched networks, packet-switched networks, and message-switched networks. **Multiplexing** Frequency-Division Multiplexing, Wavelength-Division Multiplexing, Synchronous Time-Division Multiplexing,	**15**
Unit – III	**Analog-To-Analog Conversion** Concept of modulation and demodulation,Amplitude modulation (AM), frequency modulation (FM), and phase modulation (PM) **Digital-To-Analog Conversion** Amplitude shift keying (ASK), frequency shift keying (FSK), and phase shift keying (PSK), quadrature amplitude modulation (QAM) **Analog-To-Digital Conversion** Pulse Code Modulation (PCM), Delta Modulation (DM),	**15**
	Total Marks	**45**
Text Books	1) Data Communication and Networking :: Behrouz A. Forouzan; Mc-Graw Hill Pub. 2) Computer Networks by A. S. TANENBAUM, DAVID J. WETHERALL PRENTICE HALL PublicationSoftware	
Additional Reference Books	1) Stallings, "Data and Computer Communications", Pearson Education 2012, 7th Edition	

Subject Title		[B] Microcontroller		
Subject Ref. No.		BCA 307T	No. of Credits	2
			Total No. of theory/ per Week	45/03
			Assignments / Sessional	20
			Semester Examination	30

Course Objectives

1) Understand the difference between a Microprocessor and a Microcontroller
2) Familiarize the basic architecture of 8051 microcontroller.
3) Program 8051microprocessor using Assembly Level Language and C.
4) Understand the interrupt system of 8051 and the use of interrupts.

Course Outcomes (COs)

CO-1	Understand difference between microprocessor & Microcontroller
CO-2	Describe architecture and operation of Microcontroller 8051 & 8085 Microprocessor
CO-3	Able to apply the fundamentals of assembly level programming of microcontroller
CO-4	Able to understand the 8051 interrupt concepts

		Number of Lecture
Unit – I	**Fundamentals of Microprocessor:** Compare microprocessor and microcontroller, Architecture of 8085 microprocessor, Pin details and functional operation of 8085, Memory and I/O interfacing, Basics of Programming.	**15**
Unit – II	**Introduction to 8051 Architecture:** The 8051 Architecture- Hardware- Oscillator and clock-program counter data pointer-registers-stack and stack pointer-special function registers-memory organization-program memory-data memory Input / Output Ports External memory counter and timer-serial data Input / output-Interrupts	**15**

Unit – III	**8051 Programming in Assembly Language:** Basics of 8051 Assembly Language Programming-Structure of Assembly language-Assembling and running an 8051 program- Moving Data, Different Addressing modes-Accessing memory using various addressing modes- Arithmetic operations and Programs-Logical operations and Programs -Branching - I/O Port Programs – bit level instructions and Programs –Timer and counters - and application Programs, Interrupt programming, 8051 programming in 'C'	**15**
	Total Marks	**45**
Text Books	1) Microprocessor Architecture: Programming and Applications with the 8085, Penram International Publishing by R. S. Gaonkar 2) The 8051 Microcontrollers and Embedded Systems by Muhammed Ali Mazidi 3) Microcontrollers [Theory and Applications] – Ajay Deshmukh, TMH, New Delhi, 2009	
Additional Reference Books	https://nptel.ac.in/courses/108105102	

Subject Title		[C] Computer Hardware			
Subject Ref. No.		BCA 307T	No. of Credits		2
			Total No. of theory/ per Week		45/03
			Assignments / Sessional		20
			Semester Examination		30

Course Objectives

1) Familiarize the hardware components of the computer system.
2) Assemble and disassemble a computer system.
3) Install and configure various expansion cards, peripherals, BIOS, operating system and device drivers
4) Provide skill in troubleshooting computers and the peripherals

Course Outcomes (COs)

CO-1	**Identify and describe the functions of essential computer components:**
CO-2	Assemble and repair Desktop Computer with all its hardware components,**Troubleshoot common computer hardware problems**
CO-3	Install different Operating System and all other application software, Customize Operating System and maintenance of system application software
CO-4	Install Printer, Scanner and troubleshoot their faults.

		Number of Lecture
Unit – I	Architecture of the Computer, **Hardware,** CPU, memory, storage devices, motherboard, and peripherals, Operating system concept, Fundamentals of Electricity, About AC and DC, **Basic Input Output System** Introduction to BIOS/CMOS Setup, POST (Power on Self-Test), BIOS/CMOS Configuration Date, Time, Enable/Disable Devices, Booting Sequence/Boot Order, **Operating System** Types of Operating Systems. Functions & Features, Process of Booting	**15**

	OS, installation of Windows8.1, 10, 11 Activation & Automatic Updating procedures, installation of Linux OS.	
Unit – II	**Computer Management** Computer Management, Disk Management, Defragmentation, Services & Applications, Local Users and Groups, Partitioning of Hard Drive/ SSD - Primary, Extended, Logical partitions using Partition Tools in Windows. **Central Processing Unit & Main board** CPU, Architecture, Speed, Types of CPU (XT and AT technologies) 32/64 Bit. Types process or technologies like Clock speed, Bus speed, Cache memory, Chipset, FSB, Bus, CPU Sockets, Interface Ports used to connect different Peripherals, **Primary and Secondary Memory**. RAM, ROM, Cache Memory, Buffer Memory, Virtual Memory. Speed, Timeline (EDO, NON-EDO, SD, RD, DDR, DDR2, DDR3, DDR4), Hybrid Memory, Comparing different RAM,	**15**
Unit – III	**Optical Drives** - Types of Media-(CD/DVD/ Blu-ray),, Difference between Red Ray technology Drives and Blue Ray Technology Drives., Layers of CD and DVD, Difference between CD and DVD. **Keyboard & Mouse** Types of Keyboards, Keyboard Layout, Working Principles, Keyboard Interfaces DIN Type, PS/2, USB, wireless, Keyboard Problems and Troubleshooting, Types of Mouse, Principles working ,Interfaces (Serial, PS/2,USB,wireless), Mouse Problems and Troubleshooting **Monitor** Types of Monitors (CRT/LCD/LED), Monitor Power Supply types, Possible Problems and Troubleshooting. **Printer** Types of Printers, Working Principles of each type, Possible Printer Problems and Troubleshooting Techniques,	**15**
	Total Marks	**45**
Text Books	1) James K.L, Computer Hardware: Installation ,Interfacing, Troubleshooting and Maintenance, PHI 2) ManaharLotai,PradeepNiar, Modern Computer Hardware Course, BPB Publication, 2011	
Additional Reference Books	https://www.tutorialspoint.com/computer_fundamentals/computer_hardware.htm	

Subject Title		[A] Computer Networking Lab			
Subject Ref. No.		BCA 308P	No. of Credits		2
			No. of theory/ per Week		45/03
			Assignments / Sessional		20
			Semester Examination		30

1) Installation of different types of OS Win 7/8/10/11,
2) Study of different types of Network cables and practically implement the cross-wired cable & straight through cable using clamping tool.
3) Connect the computers in Local Area Network (Wired Network)
4) Sharing of Hardware resources in the network
5) Study of different Networking Devices in Detail
6) Configure wireless Router & create the wireless network
7) Study of IP address & implement in network using different classes
8) Study of basic network command and Network configuration commands.
9) Installation and introduction of simulation tools packet tracer
10) Remote Desktop Connection

Subject Title		[B] Microcontroller Lab			
Subject Ref. No.		BCA 308P	No. of Credits		2
			Total Practical Hours / per Week		45/03
			Assignments / Sessional		20
			Semester Examination		30

1) WRITE AN ALP to TRANSFER A BLOCK OF DATA BYTES FROM SOURCE MEMORY TO DESTINATION MEMORY USING 8051
2) WRITE AN ALP TO EXCHANGE TWO BLOCKS OF DATA BYTES USING 8051
3) WRITE AN ALP TO FIND THE SMALLEST ELEMENT IN AN ARRAY USING 8051
4) WRITE AN ALP TO FIND THE LARGEST ELEMENT IN AN ARRAY USING 8051
5) WRITE AN ALP TO ARRANGE N 8-BIT NUMBERS IN ASCENDING ORDER.
6) WRITE AN ALP TO ARRANGE N 8-BIT NUMBERS IN DESCENDING ORDER.
7) WRITE AN ALP TO PERFORM ADDITION OF NUMBER
8) WRITE AN ALP TO PERFORM SUBTRACTION OF NUMBER
9) WRITE AN ALP TO PERFORM MULTIPLICATION OF NUMBER
10) EXAMPLES FOR LOGICAL BYTE OPERATIONS

Link: - https://atria.edu/assets/ece/manuals/mc.pdf

Subject Title		[C] Computer Hardware Lab			
Subject Ref. No.		BCA 308P	No. of Credits		2
			Total PracticalHours / per Week		45/03
			Assignments / Sessional		20
			Semester Examination		30

1) Identification of different Components of a computer and demonstration and uses of them & study different Tools/equipment used for assembling/disassembling a PC.

2) Demonstration of BIOS/CMOS setup, POST in a Computer step by step & Demonstration of different types of configurations and effect of changes in an existing BIOS of a system

3) Installation of different types of OS Win 7/8/10/11, Demonstration on Windows Using: Safe Mode, Safe Mode Boot options, Last Known Good Configuration, etc.

4) Demonstrating Windows Diagnostic Tools, System Restore, Creating Restore point, restore using Restore point, etc. & Installation of different device driver for the system.

5) Installation & Uninstalling of different application software & Antivirus.

6) Demonstrating computer management in Windows using Disk manager, Shrink, Extend & Creating Logical Drive etc. Creating users, groups etc.

7) Demonstrate fixing System case / Cabinet – fixing IO templates, setting cooling fans, fixing Motherboard , CPU & Heat sink assembly, Fixing RAM modules, Adding HDD/DVD, FDD, SMPS – power connection to various components - motherboard, drives, Add-on card, cooling fans, etc.

8) Assembling and Disassembling of Laptop to identify the parts and to install OS and configure it.

9) Install and Configure Dual OS Installation

10) Identify problems using BIOS beep codes and error codes, troubleshooting SMPS, Processor, Motherboard components, RAM, Expansion cards, drives etc.

VSC-3 VSC: Vocational Skill Course (Choose any one)

Subject Title		**Java Script-Lab**		
Subject Ref. No.		**BCA309P**	**No. of Credits**	2
			No. of Periods / Week	45 / 3
			Assignments / Sessional	20
			Semester Examination	30

Course Objectives

1)	Write code using JavaScript with HTML.
2)	Write program for form validation.
3)	Write basic scripts to perform different operations.
4)	Write program using HTML+CSS+Javascript.

Pre Requisite	Basic knowledge of HTML tags and CSS.	**Number of Lecture - 45**

Lab Assignment

1. Write javascript code to demonstrate use of
   a. For loop
   b. If condition
   c. Nested if
   d. While loop
   e. For each loop
   f. Switch statement
   g. Alert box
   h. Prompt box
   i. Document.write functions
   j. User defined functions
   k. Variables
   l. Constants
   m. Ternary operators
   n. Increment ++
   o. Decrement – operators
   p. Arithmetic operators
   q. Comparision operators

2. Write a JavaScript code that will display different images as per selection of user selection. (Use radio buttons).

3. Write JavaScript code that will accept two numbers from user & on click of buttons (add, mul, sub, div) display appropriate result in the third textbox.

4. Write JavaScript code that will make sure that user must enter values in all the fields if user fails to do so then display appropriate error message to user.(Take suitable fields for Registration form – cover all the elements)

5. Write JavaScript code that will place textbox & drop down box on webpage , accept input from textbox & accept a digit from 1-10 from drop-down as per selection display alert message as many times as value selected from dropdown box & message will be the input of the textbox.

6. write a HTML code that will display a textbox & a drop down box , accept the string from user in textbox & a number (1-9)from drop down box , display the string as many times as the number selected by user on webpage. (using **JavaScript**)

7. Write an HTML code that will accept numbers from user until user enters 0 from prompt box & display the message "You have entered…*number*…" On the webpage for every number. (using **JavaScript**)

8. Write a program using **HTML 5** that will use number, email, range, date.

9. Write a HTML code that will display a textbox on webpage to accept a name of student. Using **JavaScript** make sure that only alphabets should be accepted. (**use regular expressions**)

10. Write a HTML code that will display a textbox on webpage to accept an age of student. Using **JavaScript** make sure that only numeric value should be accepted. (**use regular expressions**)

11. Write a HTML code that will display a textarea on webpage to accept address of student. Using **JavaScript** make sure that only alphanumeric value should be accepted. (**use regular expressions**)

12. Write a HTML code that will display a textarea on webpage to accept a paragraph from user. Using JavaScript display the total count of words present in the paragraph.

13. Write a HTML code that will display a textarea on webpage to accept a paragraph from user. Using JavaScript display the total count of word 'sachin' present in the paragraph.

14. Write a HTML code that will display a textarea on webpage to accept a paragraph from user. Using JavaScript replace the every occurrences of word 'sachin' with 'ramesh' present in the paragraph.

15. Write a HTML code that will display a textarea on webpage to accept a paragraph from user. On click of button Using JavaScript display first 5 and last 5 word with red color , times new roman font , size – 24 using embedded stylesheet.

16. Write a HTML code that will display a textarea on webpage to accept a paragraph from user. On click of button Using JavaScript display first 5 word with red color , times new roman font , size – 24 using external stylesheet on webpage

Text Books	• Head First JavaScript (2007) By michael Morrison	
Additional Reference Books	• Learn to Code HTML and CSS (English) (Paperback) by Howe • Javascript Bible (English) 7th Edition by Danny Goodman Michael, Morrison Paul Novitski Tia GustaffRayl • Javascript Programming: Pushing the Limits (English) 1st Edition By(2013)Jon Raasch • JavaScript: The Definitive Guide (2011) by Flanagan, David	

Subject Title		Oracle -Lab			
Subject Ref. No.		BCA-309P	No. of Credits		2
			No. of Periods / Week		45 / 3
			Assignments / Sessional		20
			Semester Examination		30

Course Objectives

1)	To equip students with the skills to create, modify, and manage database structures using DDL commands, ensuring proper data organization and integrity within relational databases.
2)	Apply the Conceptual Design Model and Database Hierarchical Structure to construct the real-world requirement.
3)	Analyze the various constraints and functions to populate the database & implement different working concept of DBMS through SQL Queries.
4)	Present the result of database creation and querying process, document it.

Pre Requisite	Basic Knowledge of DBMS and Oracle	Number of Lecture - 45

Lab Assignment

Assignment 1.

Consider the following schema for a Library Database:
BOOK(Book_id, Title, Publisher_Name, Pub_Year)
BOOK_AUTHORS(Book_id, Author_Name) PUBLISHER(Name, Address, Phone)
BOOK_COPIES(Book_id, Programme_id, No-of_Copies)
BOOK_LENDING(Book_id, Programme_id, Card_No, Date_Out, Due_Date)
LIBRARY_PROGRAMME(Programme_id, Programme_Name, Address)
Write SQL queries to
1. Retrieve details of all books in the library – id, title, name of publisher, authors, number of copies in each Programme, etc.
2. Get the particulars of borrowers who have borrowed more than 3 books, but from Jan 2017 to Jun 2017.
3. Delete a book in BOOK table. Update the contents of other tables to reflect this data manipulation operation.
4. Partition the BOOK table based on year of publication. Demonstrate its working with a simple query.
5. Create a view of all books and its number of copies that are currently available in the Library.

Assignment 2.

Consider the schema for College Database:
STUDENT(USN, SName, Address, Phone, Gender)
SEMSEC(SSID, Sem, Sec)
CLASS(USN, SSID)
COURSE(Subcode, Title, Sem, Credits)
IAMARKS(USN, Subcode, SSID, Test1, Test2, Test3, FinalIA)
Write SQL queries to
1. List all the student details studying in fourth semester 'C' section.
2. Compute the total number of male and female students in each semester and in each section.
3. Create a view of Test1 marks of student USN '1BI15CS101' in all Courses.
4. Calculate the FinalIA (average of best two test marks) and update the corresponding table for all students.
5. Categorize students based on the following criterion: If FinalIA = 17 to 20 then CAT = 'Outstanding' If FinalIA = 12 to 16 then CAT = 'Average' If FinalIA< 12 then CAT = 'Weak'

Assignment 3.

Consider the schema for Company Database:
EMPLOYEE(SSN, Name, Address, Sex, Salary, SuperSSN, DNo)
DEPARTMENT(DNo, DName, MgrSSN, MgrStartDate)
DLOCATION(DNo,DLoc) PROJECT(PNo, PName, PLocation, DNo)
WORKS_ON(SSN, PNo, Hours)
Write SQL queries to
1. Make a list of all project numbers for projects that involve an employee whose last name is 'Patil',either as a worker or as a manager of the department that controls the project.
2. Show the resulting salaries if every employee working on the 'IoT' project is given a 10 percent raise.
3. Find the sum of the salaries of all employees of the 'Accounts' department, as well as the maximum
salary, the minimum salary, and the average salary in this department.
4. Retrieve the name of each employee who works on all the projects controlled by department number 5
(use NOT EXISTS operator).
5. For each department that has more than five employees, retrieve the department number and the numberof its employees who are making more than Rs. 6,00,000.

Text Books	1. *Murach's SQL Server 2019 for Developers*. Mike Murach & Associates. 2. *SQL Cookbook*. O'Reilly Media.	
Additional Reference Books	3. *SQL in a Nutshell: A Desktop Quick Reference*. O'Reilly Media.	

Subject Title		Introduction to XML Lab			
Subject Ref. No.		BCA309P	No. of Credits		2
			No. of Periods / Week		45 / 3
			Assignments / Sessional		20
			Semester Examination		30

Course Objectives

This course includes introduction of skills and practices related to Extensible Markup Language (XML)ncludes Document Type Definition (DTD), well-formed and valid XML documents, XML schemes, and Extensible Style Language (XSL). XML is designed to meet the challenges of large-scale electronic publishing and is also playing an increasingly important role in the exchange of a wide variety of data on the Web and elsewhere.

1)	Gain a thorough understanding of XML Documents and the XML family of languages and tools.
2)	To understand the types of nodes that make up an XML Document. XML Namespaces
3)	To familiar with XML Document Validation, e.g. XML Schema, DTD, XSLT,
4)	Master the fundamentals of the XPath Language & CSS

Pre Requisite	Knowledge of HTML	Number of Lecture - 45
	1. WAP program in XML to display the simple message. 2. WAP program in XML to display multiple student records. 3. WAP program in XML for DTD. 4. WAP program in XML for schema with name Shiporder 5. WAP program in XML to show three child attributes and elements. 6. WAP program in XML to create complex element employee with Personnel Info. 7. WAP program in XML to store information about books and display the file using CSS 8. WAP program in XML for creating the XML file that contains the information about five students and displaying the XML file using XSLT. 9. WAP in XML to show book description. 10. WAP in XML to show introduction of employee. 11. WAP in XML by using tree structure for defining organizational structure. 12. WAP in XML to show a news using news specification. 13. WAP in XML to show today's weather forecast. 14. WAP in XML to show menu card description for hotel using different element.	

	15. WAP in XML to show student information using different attributes. 16. WAP in XML to show list of practical. 17. WAP in XML to show tree structure in college. 18. WAP in XML to student id information using elements.	
	Total Lectures	**45**
Text Books	1. Learning XML Erik T. Ray 2. XML: The Complete reference by Willamson McGraw Hill Education	
Additional Reference Books	1. XML in Easy Steps Mike McGrath 2. XML Programming Bible by Brian Benz & John R. Durant 'E-Book' 3. Beginning XML by Joe Fawcett, Danny Ayers, Liam R. Wiley Publ.	
Website	https://www.javatpoint.com/what-is-xml https://www.w3schools.com/xml/default.ASP https://www.geeksforgeeks.org/xml-basics	

AEC : Ability Enhancement Course (Choose any one – Modern Indian Languages)

B Subject Title		**English-III**		
Subject Ref. No.		**BCA-310T**	**No. of Credits**	3
			No. of Periods / Week	3
			Total periods	45
			Assignments / Sessional	20
			Semester Examination	30

Course Objectives

1)	To build upon students' Grammatical command on English Language for enhancement of their receptive and productive skills.
2)	To highlight the importance of proficiency in speaking a language in different domains. To help students differentiate among the various domains on the basis of language.
3)	Familiarize learners with the importance of listening skills • Provide an overview of different types of listening skills • Introduce some useful strategies for effective listening
4)	To familiarize learners with the importance of listening skills and Make them aware of the importance of reading skills To provide a few strategies to overcome listening errors in communication

Course Outcomes (COs)

At the end of the course, students will be able to:

CO-1	The students are expected to realize their conscious and unconscious mistakes and apply these strategies to know how to be effective listener in their day-to-day life
CO-2	Learners would produce correct sentences both syntactically and grammatically.
CO-3	Upon completion of the course the students are able to identify different types of listening and reading. They can use each listening and reading type based on their need and context.
CO-4	The students would be able to use their applied knowledge in various fields.
CO-5	The Learner's Community would be able to write text in an appropriate style, write Complex reports, letters and present a case with an effective logical structure and review any professional or literary work of art, develop knowledge about computer assisted language learning and its application.

Pre Requisite			Number of Lectures
Unit – I		**Strategies to Improve Listening Skills** Introduction, Objectives, Listening Skills, Types of Listening, Importance of Listening, Barriers to Effective Listening, Strategies to improve Listening Skills	**10**
Unit – II		**Strategies to Improve Reading Skills** Introduction, Objectives, Reading Skills, Significance of Reading, Types of Reading, Barriers to Effective Reading, Strategies to Improve Reading Skills	**10**
Unit – III		**Basic Grammar and its Usage** Introduction, Objectives, Basic Grammar and its Usage, Parts of Speech, Articles, Tenses, Subject-Verb Agreement, Degree of Comparison, Active and Passive, Direct and Indirect Speech	**10**
Unit – IV		**Speaking Skills in Different Domains** Introduction, Objectives, Speaking Skills in Different Domains, Personal Domain, Social Domain, Academic Domain, Professional Domain	**10**
Unit – V		**Concept of Communication** Introduction, Objectives, Attributes of communication, Process of communication, Feedback	**05**
		Total	**45**

Assignments for Internal Assessment

1. Letter Writing 2. Writing of formal Application & Email drafting. 3. Reading Prose Lesson, Poems, Fiction, Drama 4. Seminar Presentations 5. Peer Discussions 6. Peer interaction based on task/activity 7. Appropriate usage of pauses, ellipsis, and Discourse items while speaking. 8. Developing Listening Skills 9. Listening to audio- lingual aids 10. Listening- social, political, historical and scientific speeches 11. Power point Presentation not less than 10 slides along with self-introduction.	**15**
Total	**45**
Reference books	1. Urmila Rai, S.N.Rai.Business Communication. Himyalaya Publishing House,Mumbai. 2. Bhardwaj, Amita. Improving Reading Skills. New Delhi: Sarup & Sons, 2004. 3. Murphy, R. English Grammar in Use, 4th edition, London: Cambridge University Press.2012.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
Faculty of Management Science
Curriculum Structure
Bachelor of Computer Applications (BCA) Honours
Academic Year 2024-2025
Semester -IV

DSC-7: Discipline Specific Core

Subject Title		**Data Structure using C**		
Subject Ref. No.		**BCA-401T**	**No. of Credits**	2
			No. of Periods / Week	45 / 3
			Assignments / Sessional	20
			Semester Examination	30

Course Objectives

This subject helps to clarify the concepts of data structure which help to enhance programming techniques in procedure oriented language. This subject covers all the techniques of stack, queue , tree and graph theory and its implementation in normal C programming language.

1)	To enhance the advance concepts of an Array with its applications
2)	To provide the knowledge of basic data structures and their implementations.
3)	To understand importance of data structures in context of writing efficient programs.
4)	To develop skills to apply appropriate data structures in problem solving.

Pre Requisite	Basic knowledge of C programming	**Number of Lecture**
Unit – I	**Introduction To Data Structure :** Introduction, Data Definition, Data Object, Data Types, Built-in Data Type, Derived Data Type, Data Structure, Implementation of Data Structure **Array :** Array as Data Structure, Storage Representation of Arrays, Applications of Arrays, Sparse Matrices, Addition of Sparse Matrices, Transpose of a Sparse Matrix	**10**
Unit – II	**Stack :** Introduction, Definition, Operation on Stack, Static & Dynamic Implementation of a Stack, Application of Stack, Recursion, Infix, Prefix & Postfix expression, **Queue:** Introduction, Definition of a Queue, Operation on a Queue, Static & Dynamic Implementation of Queue, Types of Queue, Circular Queue,	**10**

	Priority Queue, DEQueue, Application of Queue, Job Scheduling, Reversing Stack using Queue	
Unit – III	**Linked List :** Introduction, Drawback of Sequential Storage, Concept of Linked List, Implementation of Linked List, Operation of Linked List, Creating a List, Displaying a List, Inserting an element in the List, Deleting an element, Other Operation & Applications, Types of Linked List Reversing a Linked List, Circular Linked List Concept, Doubly Linked List Concept	**10**
Unit – IV	**Tree :** Tree Terminology, Binary Tree, Binary Tree Representation, Binary Search Tree (BST), Creating a BST, Binary Search Tree Traversal, Preorder Traversal, Inorder Traversal, Postorder Traversal, AVL tree	**10**
Unit – V	**Graph :** Introduction, Graph Representation, Adjacency Matrix, Adjacency List, Graph Traversals, Depth First Search, Breadth First Search, Applications of Graph	**05**
	Total Lectures	**45**
Text Books	3. C & Data Structure Balagurusamy, 4. Data Structure through C in depth Shrivastava&Shrivastava , 5. Data Structure through C Y.P. Kanetkar	
Additional Reference Books	4. Data Structure Seymour Liptsuz, Data Structure Tannebaum , 5. Data structure and program design in c R.L.Kruse	
Website	https://www.w3schools.com/dsa/dsa_intro.php https://www.javatpoint.com/data-structure-tutorial https://www.studytonight.com/data-structures/	

Subject Title	: Data Structure using C- Lab		
Subject Ref. No.	BCA-402P	No. of Credits	2
		No. of Periods / Week	45 / 3
		Assignments / Sessional	20
		Semester Examination	30

Course Objectives

This subject helps to clarify the concepts of data structure which help to enhance programming techniques in procedure oriented language. This subject covers all the techniques of stack, queue , tree and graph theory and its implementation in normal C programming language.

1)	To enhance the advance concepts of an Array with its applications
2)	To provide the knowledge of basic data structures and their implementations.
3)	To understand importance of data structures in context of writing efficient programs.
4)	To develop skills to apply appropriate data structures in problem solving.

Pre Requisite	Basic knowledge of C programming	Number of Lecture
Unit – I	**Assignments on Unit -1** 1.Write a program to create single dimension array, enter value and print it 2.Write a program to create double dimension array, enter value and print it 3.Write a program addition, subtraction & multiplication operations on Single dimension array. 4.Write a program addition , subtraction & multiplication operations on double dimension array. 5.Write a program for Sparse matrix	10
Unit – II	**Assignments on Unit -2** 1.Write a program to create a stack and display it in forward & backward direction using an Array 2.Write a program to perform PUSH & POP operation and display it using an Array 3.Write a program to create a stack and search element in stack using an Array 4.Write a program to enter string and print it in reverse manner 5.Write a program to create a Queue and display it in forward & backward direction using an Array 6.Write a program to create a Queue , Delete Element & display it using an Array. 7.Write a program to create a Queue , Add Element & display it using an Array. 8.Write a program to create a Queue ,display and search element using an Array. 9.Write a program to create a Circular Queue	10
Unit – III	**Assignments on Unit -3** 1. Write a program to create a Linked List and Display 2. Write a program to create a Linked List, add node at beginning and display it. 3. Write a program to create a Linked List, add node at end and display it 4. Write a program to create a Linked List, add node at between and display it	10

	5. Write a program to create, delete first element and display it 6. Write a program to create, delete last element and display it 7. Write a program to create, delete between element and display it 8. Write a program to create, display and search element. 9. Write a program to implement stack using Linked List. 10. Write a program to implement queue using Linked List.	
Unit – IV	**Assignments on Unit -4 (to be performed in Handbook)** 1. Write Inorder / Preorder / Post order of any tree 2. Construct tree using Inorder , Preorder and Postorder 3. Representation of algebraic equations in Extended Tree 4. Create a Memory allocation for Tree using Adjacency Matrix . 5. Create a Memory allocation for Tree using Adjacency List . 6. Construct Binary Threaded Tree	**10**
Unit – V	**Assignments on Unit - 5 (to be performed in Handbook)** 1. Write a relation for Directed Type of Graph (Three Examples) 2. Write a relation for Un-directed Type of Graph (Three Examples) 3. Represent given graph using Adjacency Matrix (Three Examples) 4. Represent given graph using Adjacency List(Three Examples) 5. Find DFS & BFS for given graph (Three Examples) 6. Find Spanning Tree of given graph (Three Examples)	**05**
	Total Lectures	**45**
Text Books	1.C & Data Structure Balagurusamy, 2. Data Structure through C in depth Shrivastava&Shrivastava , 3. Data Structure through C Y.P. Kanetkar	
Additional Reference Books	4.Data Structure Seymour Liptsuz, Data Structure Tannebaum , 5.Data structure and program design in c R.L.Kruse	
Website	https://www.w3schools.com/dsa/dsa_intro.php https://www.javatpoint.com/data-structure-tutorial https://www.studytonight.com/data-structures/	

Subject Title		ASP.Net			
Subject Ref. No.		BCA-403T	No. of Credits		2
			No. of Periods / Week		45 / 3
			Assignments / Sessional		20
			Semester Examination		30

Course Objectives

1)	To introduce students to the ASP.NET framework, its components, and its role in web development, providing a foundational understanding of web application architecture within the .NET environment.
2)	To equip students with the skills to create and manage web forms and utilize various server controls, enabling them to build interactive and user-friendly web applications.
3)	To develop an understanding of state management techniques and form validation controls, ensuring data integrity and improving the user experience in web applications.
4)	To provide knowledge on connecting to databases, executing queries, and binding data to server controls, allowing students to integrate and manipulate data within their web applications.

Pre Requisite	Visual Basic	Number of Lecture
Unit – I	**Introduction to ASP.NET** • **Overview of ASP.NET**: o Introduction to ASP.NET and its features o Differences between ASP.NET Web Forms and ASP.NET MVC o Understanding the .NET Framework and .NET Core • **Development Environment**: o Setting up the development environment (Visual Studio) o Creating an ASP.NET project o Understanding the project structure	09
Unit – II	**Web Forms and Server Controls** • **ASP.NET Web Forms**: o Introduction to Web Forms o Page lifecycle o Creating and managing Web Forms • **Server Controls**: o Understanding server controls o Standard controls: TextBox, Button, Label, CheckBox, RadioButton, etc. o Data controls: GridView, Repeater, DataList	09

Unit – III	**State Management and Validation** • **State Management**: o ViewState, Session State, Application State o Cookies and Query Strings • **Validation Controls**: o Client-side vs. server-side validation o RequiredFieldValidator, RangeValidator, RegularExpressionValidator, CustomValidator o ValidationSummary control	**09**
Unit – IV	**Data Access and Binding** • **Data Binding**: o Data binding concepts o Binding data to controls: GridView, Repeater, DropDownList	**09**
Unit – V	**Web Services and Security** ❑ Authentication and Authorization ❑ Forms Authentication and Windows Authentication ❑ Role-based security ❑ Protecting against common web vulnerabilities (SQL injection, XSS, CSRF)	**09**
	Total Lectures	**45**
Text Books	1. **MacDonald, M. (2010). *Beginning ASP.NET 4: in C# and VB.* Wrox.** 2. Liberty, J., & Hurwitz, M. (2018). *Programming ASP.NET Core*. O'Reilly Media.	
Additional Reference Books	Harwani, B. M. (2016). *ASP.NET MVC with Entity Framework and CSS*. Addison-Wesley Professional.	

Subject Title		ASP.Net-Lab			
Subject Ref. No.		BCA404P	No. of Credits		2
			No. of Periods / Week		45 / 3
			Assignments / Sessional		20
			Semester Examination		30

Course Objectives

1)	To familiarize students with the ASP.NET development environment and basic project setup.
2)	To develop skills in creating and managing web forms and handling server controls.
3)	To understand and implement various state management techniques in ASP.NET
4)	To gain hands-on experience with database connectivity, data manipulation, and data binding in ASP.NET.

Pre Requisite	Visual Basic and SQL	Number of Lecture - 45

LAB Assignment

Setting Up the Development Environment

- **Practical Exercises**:
  - Installing Visual Studio and necessary components for ASP.NET development.
  - Creating a new ASP.NET Web Application project.
  - Understanding and navigating the project structure.
  - Running the default application and exploring the output.

Creating and Managing Web Forms

- **Practical Exercises**:
  - Creating a simple web form with various server controls (TextBox, Button, Label).
  - Handling button click events to perform basic operations.
  - Using data controls like GridView and Repeater to display data.
  - Implementing validation controls (RequiredFieldValidator, RangeValidator, etc.) to ensure data integrity.

State Management Techniques

- **Practical Exercises**:
  - Using ViewState to maintain state between postbacks.
  - Implementing Session State to store user data across multiple pages.
  - Managing Application State for global data storage.
  - Using cookies and query strings for state management.

Data Access and Data Binding

- **Practical Exercises**:
  - Connecting to a SQL Server database using ADO.NET.
  - Executing SQL queries and displaying results in a GridView control.
  - Implementing CRUD operations (Create, Read, Update, Delete) using SqlCommand and SqlDataAdapter.
  - Using Entity Framework to perform data operations and binding data to controls like DropDownList and ListBox.

Text Books	1. Esposito, D. (2017). *Programming ASP.NET Core*. Microsoft Press	
Additional Reference Books	1. MacDonald, M. (2018). *Beginning ASP.NET for Visual Studio 2017: Beginning ASP.NET*. Apress. 2. Freeman, A. (2020). *Pro ASP.NET Core 3*. Apress.	

Minor (M3)

Subject Title	:	**Programming using Python**			
Subject Ref. No.	:	**405-T**	**No. of Credits**	:	**02**
			No. of Periods / Week		**45 / 3**
			Assignments/Sessional	:	**20**
			Semester Examination	:	**30**

Course Outcomes(Cos)
At The end of the course, Students will be able to:

CO-1	**Apply the principles python programming.**
CO-2	**Write clear and Effective python code.**
CO-3	**Create applications using python programming.**
CO-4	**Access database using python programming.**
CO-5	**Develop web applications using python programming.**
CO-6	**Develop and Use web services using python.**

Prerequisite	:	Working knowledge of c/C++ Programming, Basic algorithms and data structure concepts.
Unit–I	:	Introduction to python programming language: Strengths and weaknesses, IDLE, Dynamic types, Naming conventions, String values, String operations, Strings lices, String operators, Numeric data types, Conversions ,Built in functions
Unit–II	:	Data Collections And Language Component: Introduction, Control Flow And Syntax, Indenting, The If Statement, Relational Operators, Logical, Operators, True Or False, Bitwise operators, The while loop, Break and continue, The for loop ,Lists, Tuples, Sets, Dictionaries, Sorting dictionaries, Copying collections.
Unit–III	:	Object and classes: Classes in python, Principles of object orientation, Creating Classes, Instance methods, File organization special methods, Class variables, Inheritance, Polymorphism, Type identification, Custom exception classes
Unit–IV	:	Functions and modules: Introduction, Defining your own functions, Parameters, Function documentation, Keyword and optional parameters, Passing collection stoa Function, Variable Number Of Arguments, Scope ,Functions - "First Class Citizens", Passing Functions To A Function, Mapping Functions In A Dictionary, Lambda, Modules
Unit–V	:	I/O And Error Handling In Python : Introduction, Data Streams, Creating Your Own Data Streams, Access Modes, Writing Data To A File, ,Reading Data From A File, Additional File Methods, Using Pipes As Data Streams, Handling IO Exceptions, Working With Directories, Metadata, Errors, Run Time Errors, The Exception Model, Exception Hierarchy, Handling Multiple Exceptions
Textbooks	:	Learning Python, 4th Edition By Mark Lutz Programming Python, 4th Edition By Mark Lutz

Subject Title		Python Lab			
Subject Ref. No.		BCA-406P	No. of Credits		2
			No. of Periods / Week		45 / 3
			Assignments / Sessional		20
			Semester Examination		30

Course Objectives

1)	To be able to introduce core programming basics and various Operators of Python programming language
2)	To demonstrate about Python data structures like Lists, Tuples, Sets and dictionaries
3)	To understand about Functions, Modules and Regular Expressions in Python Programming.
4)	To gain hands-on experience with database connectivity, data manipulation, and data binding in Python

Pre Requisite	Basic knowledge of programming	Number of Lecture - 45

LAB Assignment

1) WAP in Python for addition of two numbers.
2) WAP in Python to print Fibonacci series.
3) WAP in Python to find factorial of the given no.
4) WAP in Python to find Area of Circle.
5) WAP in Python to calculate simple interest.
6) WAP in Python to Print all Prime no in an interval.
7) WAP in Python to find largest number in an array.
8) WAP in Python for rotation of array.
9) WAP in Python to interchange first and last element in the list.
10) WAP in Python to find the length of list.
11) WAP in Python to Swap the elements from list.
12) WAP in Python to find sum of squares of first N numbers.
13) WAP in Python to find smallest number in the list.
14) WAP in Python that accepts the user's first and last name and prints them in reverse order
15) WAP in Python that accepts a sequence of comma-separated numbers from the user and generates a list and a tuple of those numbers.

Text Books	1. Learning Python, Mark Lutz, Orielly, 3 Edition 2007. 2. Python Programming: A Modern Approach, Vamsi Kurama, Pearson, 2017.	
Additional Reference Books	1. Think Python, 2 Edition, 2017 Allen Downey, Green Tea Press. 2. Introduction to Python, 2015 Kenneth A. Lambert, Cengages.	

GE/OE : Generic Elective / Open Elective (Choose any one)

Subject Title		**SPSS**		
Subject Ref. No.		**BCA-407T**	**No. of Credits**	2
			No. of Periods / Week	45 / 3
			Assignments / Sessional	20
			Semester Examination	30

Course Objectives

1)	1) Compute frequency tables for qualitative and quantitative data
2)	2) Represent data graphically
3)	3) Compute descriptive statistics of data
4)	4) Compute and interpret basic statistics

Unit 1: Introduction to SPSS
SPSS Environment: data editor, output viewer, syntax editor. Entering Data in SPSS, Variable types in SPSS and Defining variables, saving the file, importing data from Excel, recoding of variables, identification of duplicate cases, computation of new variables, addition and deletion of rows/ columns.
Unit 2: Tabulation of Data
Computation of Frequencies for different type of data (qualitative, quantitative, continuous and discrete) and scales (nominal, ordinal, interval and ratio scale), binning of data, Finding percentage, customized tables in SPSS.
Unit 3: Diagrammatic and Graphical representation of data
Plotting of Simple bar graph, Clustered bar graph, stacked bar graph, pie chart, scatter plot, line graph, histogram. Changing colors, labeling bars/ slices by counts/ percentage.
Unit 4: Measures of central tendency and dispersion using SPSS
Computation of mean, mode, median, minimum, maximum, range, quartiles, percentiles, skewness, kurtosis, variance, standard deviation.
Unit 5:Basic Statistics using SPSS
Sorting of data in ascending and descending order, finding ranks. Computation of simple correlation coefficient, spearman's rank correlation. Generating random numbers/ random sample using SPSS. Cross tables in SPSS and Chi square test for independence.

Text Books:
1. HOW TO USE SPSS ® A Step-By-Step Guide to Analysis and Interpretation, Brian C. Cronk, Tenth edition published in 2018 by Routledge.
2. SPSS for Intermediate Statistics: Use and Interpretation, Nancy L. Leech et. al., Second edition published in 2005 by Lawrence Erlbaum Associates, Inc.
3. Using IBM SPSS statistics for research methods and social science statistics, William E. Wagner, Fifth edition published in 2015 by SAGE Publications, Inc.
Reference books:
4. Jeremy J. Foster (2001). Data analysis using SPSS for windows. New edition. Versions 8-10. Sage publications. London.
5. Richard Levin & David S.Rubin (2012): Statistics for Management,7th Edition,Pearson.
6. J K Shrma (2012) ; Business statistics , Second Edition- Pearson Education.
7. Andy field (2013) : Discovering statistics using IBM SPSS statistics ,4th Edition , SAGE Publications.
8. Cunningham,B.J (2012) :Using SPSS : An Interactive Hands-on Approach.
9. K.V.S. Sarma: Statistics made simple: do it yourself on PC. PHI

Subject Title		Creativity & Innovation			
Subject Ref. No.		BCA-407T	No. of Credits		2
			No. of Periods / Week		45 / 3
			Assignments / Sessional		20
			Semester Examination		30

Course Outcomes (CO):

CO#	Cognitive Abilities	Course Outcomes
CO1	Understand the basics of creativity and innovation in technology.	
CO2	Apply mind mapping and creative techniques to solve real-world problems.	
CO3	Create - Use the SCAMPER technique to develop innovative ideas and solutions.	
CO4	Communicate - Present creative ideas effectively using storytelling and visual tools.	

Unit 1: Foundations of Creativity and Innovation

- **Introduction to Creativity:** Definition, importance, and role in technology problem-solving.
- **Creativity vs. Innovation:** How creative thinking leads to innovation in tech.
- **The Creative Process:** Stages of creativity – from idea generation to implementation.
- **Barriers to Creativity:** How to overcome mental blocks and traditional thinking.

Hands-on Activity: Brainstorm ideas to redesign a basic mobile app or website and create a creative solution.

Unit 2: Mind Mapping and Creative Thinking Techniques

- **Introduction to Mind Mapping:** Basics of mind mapping, its benefits, and how it helps with idea generation.
- **Mind Mapping for Problem Solving:** Using mind maps to break down complex tech issues into manageable parts.
- **Collaborative Mind Mapping:** How teams can use mind mapping as a creative and collaborative tool for projects.

Hands-on Activity: Create a mind map for a technology startup idea, visually breaking down the components needed to launch it.

Unit 3: SCAMPER Technique for Innovation

- **Introduction to SCAMPER:** Understanding SCAMPER (Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, Rearrange) as a creativity tool.
- **Using SCAMPER for Product Improvement:** Applying SCAMPER to improve existing products or services.
- **Team SCAMPER Exercise:** Working in groups to apply SCAMPER to a real-world business or tech problem.

Suggested Readings:

1. **Buzan, T.** – *The Mind Map Book* (BBC Active)
2. **Kelley, T. & Littman, J.** – *The Art of Innovation* (Crown Business)
3. **Brown, T.** – *Change by Design* (HarperBusiness)

Subject Title		Cyber Security			
Subject Ref. No.		BCA-407T	No. of Credits		2
			No. of Periods / Week		45 / 3
			Assignments / Sessional		20
			Semester Examination		30

Course Objectives

1)	To develop skills in students that can help them plan, implement, and monitor cyber security mechanisms to ensure the protection of information technology assets.
2)	To explain about the various facets of cyber crimes
3)	To understand the fundamentals of Cryptography
4)	Knowledge and implementation of Cyber Laws

Pre Requisite		Number of Lecture - 45
Unit – I	**Introduction To Cyber Security-** Importance of cyber security, Advantages and Disadvantages, computer security, Cyber Security Basic Terminology, CIA, Digital Piracy, Types of Security-Network Security, Cloud Security, Endpoint Security, Mobile Security, IOT Security, Application Security, Zero Trust, Cyber-attack-types of cyber-attack.	10
Unit – II	**Social Media Overview and Security-** Introduction to Social media, Types of Social media, Hashtag, Viral content, Social media marketing, Social media privacy, hacking- types of hackers, unknown links, Social Media Case Studies - Facebook, Twitter, Instagram, YouTube, LinkedIn.	08
Unit – III	**Cyber-crime and Cyber laws –** Introduction to cyber-crime, Classification of cybercrimes, Type of Cyber Crime-Identity Theft, Cyber Bullying, Cyber Stalking, Cyber Harassment, Cyber Terrorism, Plagiarism and , Child Pornography, introducing cyber law, Scope of Cyber laws, IT Act 2000 and 2008, IPC,Legal perspective of cybercrime, Cybercrime and offences,	10
Unit – IV	**Cryptography-** Definitions, types of Cryptography Classical encryption techniques, One time pad, Perfect Secrecy, DES, Triple DES, Finite fields, AES, Modes of Encryption, Asymmetric Cryptography, symmetric	10

	Cryptography, Hash function, public , Digital signature	
Unit – V	**Awareness and Training** - identify the fake software, website, application, Mail and APK Files,Online compliant process, suggestion, Dos & Don'ts- Email, Password, computer, laptop, Wireless Connectivity, Portable Media, Security from Virus & malicious Code, Social Networking, Internet Usage.	**07**
	Total Lectures	**45**
Text Books	1. Introduction to Cyber Security: Guide to the World of Cyber Security, 2021 Anand shinde. 2. Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers. 3. Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt. Ltd. 4. B. Forouzan, D. Mukhopadhyay, "Cryptography and Network Security 2/e", TataMcGraw Hill	
Additional Reference Books	1. Prashant Mali, Cyber Law & Cyber Crimes Simplified, Fourth Edition, Snow White Publications, 2017. 2. https://www.geeksforgeeks.org/cyber-security-types-and-importance/ 3. https://www.academia.edu/41448395/Social_media_and_security_how_to_ensure_safe_social_networking	

GE4/OE4 Select any one Lab with respect to selection of any one GE / OE from the above

Subject Title		**SPSS-Lab**		
Subject Ref. No.		**BCA408P**	**No. of Credits**	2
			No. of Periods / Week	45 / 3
			Assignments / Sessional	20
			Semester Examination	30

Course Objectives

1)	Compute frequency tables for qualitative and quantitative data
2)	Represent data graphically
3)	Compute descriptive statistics of data
4)	Compute and interpret basic statistics

Pre Requisite	**LAB Assignment**	**Number of Lecture - 45**

1. Create a Data Sheet in SPSS with multiple variables
2. To run Frequencies and calculate Measures of Central Tendency (Mean, Median and Mode)
3. Measures of Dispersion (Range, Variance and Standard Deviation) and Measures of Position(Quartiles and Percentiles)
4. Create the four variables and enter the data in the table and run the frequency command
5. Create Different type of Graphs (Cluster graph, stacked bar, pie, scatter , line)
6. Create Histogram for Data
7. Apply different Formatting on prepared graph
8. Calculate Central Tendency (mean, mode, median,)
9. Calculate Central Tendency (Maximum & Minimum,)
10. Calculate Central Tendency (Range , quartiles & Percentile)
11. Calculate Central Tendency (Skewness , Kurtosis)
12. Calculate Central Tendency (Variance , Standard Deviation)
13. Sorting data in ascending & descending
14. Computation of simple correlation coefficient ,
15. Computation of spearman's rank correlation
16. Apply chi square test

Text Books	1. HOW TO USE SPSS ® A Step-By-Step Guide to Analysis and Interpretation, Brian C. Cronk, Tenth edition published in 2018 by Routledge. 2. SPSS for Intermediate Statistics: Use and Interpretation, Nancy L. Leech et. al., Second edition published in 2005 by Lawrence Erlbaum Associates, Inc. 3. Using IBM SPSS statistics for research methods and social science statistics, William E. Wagner, Fifth edition published in 2015 by SAGE Publications, Inc.	

Subject Title	Creativity and Innovation Practical		
Subject Ref. No.	BCA-408P	No. of Credits	2
		No. of Periods / Week	45 / 3
		Assignments / Sessional	20
		Semester Examination	30

CO#	Cognitive Abilities	Course Outcomes
CO1	Understand the basics of creativity and innovation in technology.	
CO2	Apply mind mapping and creative techniques to solve real-world problems.	
CO3	Create - Use the SCAMPER technique to develop innovative ideas and solutions.	
CO4	Communicate - Present creative ideas effectively using storytelling and visual tools.	

Hands-on Activity:

Teams apply SCAMPER to redesign or enhance a tech product (e.g., a mobile app or website).

Subject Title		Cyber Security-Lab			
Subject Ref. No.		BCA-408P	No. of Credits		2
			No. of Periods / Week		45 / 3
			Assignments / Sessional		20
			Semester Examination		30

Course Objectives

1)	Learn challenges in social media related to privacy and security
2)	To expose students to responsible use of online social media networks.
3)	To equip students with the technical knowledge and skills needed to protect and defend against cyber threats.
4)	Take measures for self-cyber-protection as well as societal cyber-protection.

Pre Requisite	LAB Assignment	Number of Lecture - 45
1	Reporting phishing emails.	
2	Demonstration of email phishing attack and preventive measures.	
3	Basic checklist, privacy and security settings for popular Social media platforms.	
4	Reporting and redressed mechanism for violations and misuse of Social media platforms.	
5	Configuring security settings in Mobile Wallets and UPIs.	
6	Checklist for secure net banking.	
7	Setting, configuring and managing three password policy in the computer (BIOS, Administrator and Standard User).	
8	Setting and configuring two factor authentication in the Mobile phone.	
9	Security patch management and updates in Computer and Mobiles.	
10	Managing Application permissions in Mobile phone.	
11	Installation and configuration of computer Anti-virus.	
12	Installation and configuration of Computer Host Firewall.	
13	Wi-Fi security management in computer and mobile.	
14	Checklist for reporting cybercrime at Cybercrime Police Station.	
15	Checklist for reporting cybercrime online.	

SEC : Skill Enhancement Course (Choose any one)

Subject Title	:	**Quantitative Aptitude**		
Subject Ref. No.	:	**BCA-409T**	**No.of Credits:**	2
			No. of Periods / Week:	45/03
			Assignments /Sessional:	20
			Semester Examination:	30

Course Objectives

The primary goal of introducing "Quantitative Aptitude" for mathematics students is to help them develop the skills they need to pass competitive tests and get better jobs. To inspire confidence in students, efforts have been made to incorporate essential mathematical principles. Enrich their understanding and develop their logical reasoning thinking skills.

Course Outcomes(COs)

At the end of the course, students will be able to

CO-1	Enhance Problem Solving Skill
CO-2	Improve Verbal & Non-verbal ability skill
CO-3	Use their logical thinking and analytical abilities to solve reasoning questions
CO-4	Prepare for various public and private sector exams & placement drives.

PreRequisite	:	Basic Mathematics , reasoning skill
Unit–I	:	Average & Number Aptitude, Compound Interest, Age, Calendar, Clocks, Height & Distance, Percent, Profit and Loss , Speed time & Distance, Simple Interest , problems on Train, Time & Work, Surds & Indices , HCF & LCM, Area Aptitude, Ration & Proportion , Area Aptitude , Decimal Fraction, Simplification
Unit–II	:	Logarithm , Square Roots & Cube Roots, Odd man out from series , Algebraic Equations , Probability & Combinations
Unit–III	:	Logical Reasoning : Verbal : Number Series, Letter Series, Analogies, Cause & Effect, Verbal Classification, Blood relations, Logical Sequence of words, Direction Sense Test, Logical Venn Diagram
TextBooks	:	1. Quantitative Aptitude for Competitive Examinations All Government and Entrance Exams (Banking, SSC, Railway, Police, Civil Service, etc.) 40 Videos | 2000+ Solved Examples | 10000+ Practice Questions Paperback – 10 April 2022
ReferenceBook		2. Shortcuts in Quantitative Aptitude for Competitive Exams 3rd Edition by Disha Experts, Disha Publication
Website		3. Javatpoint.com 4. https://www.geeksforgeeks.org/quantitative-aptitude/ 5. https://www.indiabix.com/aptitude/questions-and-answers/#google_vignette

Subject Title		Business Communication		
Subject Ref. No.		BCA-409T	No. of Credits:	2
			No. of Periods / Week:	45/03
			Assignments / Sessional:	20
			Semester Examination:	30

Course Objectives (COs)

1)	To train students to enhance written as well as oral communication in the corporate world
2)	To help students in understanding the principles and techniques of business communication
3)	To understand the use of electronic media for communication

Course Outcomes (COs)

At the end of the course, students will be able to:

1)	Explain the need for communication in management
2)	Appreciate the need of effective writing for communication.
3)	Demonstrate the skill of effective report writing and summarizing annual reports.
4)	Analyze business correspondence and e-correspondence.
5)	Able to appreciate oral presentations

Pre Requisite		Basic awareness of Business Communication	Number of Lecture
Unit – I		**Introduction to the essentials of Business Communication:** Meaning, process and functions. Need and importance. Medium: verbal & non-verbal communication. Channels: formal & informal. Levels of communication. Direction of communication: downward, upward, lateral, & diagonal. Effective communication: difficulties/barriers and solutions. Interactive and non-interactive techniques of communication. Listening as a tool of communication, Guidelines for effective listening.	6
Unit – II		**Effective Writing:** Guidelines for clear writing. References, bibliographical research tools. Citing methods, footnotes, discussion footnotes. Use of library and internet for collection, classification and interpretation of data and information	6
Unit – III		**Report Writing:** Types of reports. Formal report: components and purpose. Organizing information: outlining & numbering sections, section headings, sub-headings, & presentation. Writing reports on field work/visits to industries, business concerns. Summarizing annual reports of companies: purpose, structure and principles. Drafting minutes.	9
Unit – IV		**Business Correspondence and E-Correspondence:** Need and importance of business letters. Office memorandum, office circulars, notices and orders. Technology for communication.EffectiveIT communication tools. Electronic mail: advantages, safety and smartness in email. E-mail etiquettes.	12

Unit – V		**Spoken English and Oral Presentation:** Effective negotiation: elements, process and general guidelines. Telephonic conversation. Conducting & facing interviews. Conducting & participating in group decisions. Making presentations: content and organizing. Features of a good presentation. Delivering a presentation.	**12**
Reference Books:		1. C.B.Gupta . Essentials of Business Communication, Sultan Chand & Sons. 2. Kaul, A. Effective Business Communication, 2nd ed. PHI learning 3. R. C. Bhatia, Business Communication, Ane Books Pvt Ltd, New Delhi. 4. Raman and Singh, Business Communication. Oxford University Press	

Subject Title		Life Skills			
Subject Ref. No.		BCA-409T	No. of Credits		2
			No. of Periods / Week		45/03
			Assignments/Sessional		20
			Semester Examination		30

Course Outcomes

CO#	Cognitive Abilities	Course Outcomes
CO1	Understand	**Develop self-awareness and empathy for building positive relationships.**
CO2	Apply	**Utilize critical and creative thinking skills for effective problem-solving.**
CO3	Analyze	Learn to cope with stress, manage emotions, and set achievable personal goals.
CO4	**Communicate**	**Improve verbal and non-verbal communication to enhance interpersonal relationships.**

Unit 1	**Self-Awareness, Empathy, and Communication** **Topics Covered:** • Self-Awareness: Identifying personal strengths and weaknesses; building self-esteem. • Empathy: Understanding others' emotions and perspectives; the importance of empathy in relationships. • Effective Communication: Developing verbal and non-verbal communication skills; building strong interpersonal relationships. **Activities:** • Empathy-building games: Role-playing activities to understand others' emotions and perspectives. • Communication role-playing: Enhancing listening skills and overcoming communication barriers through interactive scenarios.
Unit 2	**Critical Thinking, Creative Thinking, and Decision Making** **Topics Covered:** • Critical Thinking: Analyzing and evaluating information; enhancing problem-solving and analytical abilities. • Creative Thinking: Fostering creativity, innovation, and thinking outside the box. • Decision Making: Understanding decision-making processes and models; making informed choices. **Activities:** • Critical and creative thinking exercises: Use puzzles, lateral thinking games, and idea-generation workshops. • Problem-solving activities: Group activities focused on solving real-world scenarios using creative approaches. • Decision-making case studies: Analyze real-life case studies to practice structured decision-making models.
Unit 3	**Coping with Stress, Emotional Intelligence, and Goal Setting** **Topics Covered:** • Coping with Stress: Identifying stressors; exploring stress management techniques such as relaxation, time management, and mindfulness. • Emotional Intelligence: Recognizing and managing emotions; developing emotional resilience and regulation. • Goal Setting: Understanding and creating SMART goals (Specific, Measurable, Achievable, Realistic, Time-bound) for personal and professional growth.

	Activities: • **Stress management workshops: Practice relaxation techniques like mindfulness, guided breathing, and physical exercises.** • **Emotional regulation activities: Exercises focused on managing anger, frustration, and practicing self-control.** • **Goal-setting workshops: Students create personal growth plans with actionable steps using the SMART framework.**

Recommended Resources:

- **Handbook of Activities on Life Skills (Provided materials)**
- **Additional readings and case studies on life skills and emotional intelligence.**

AEC : Ability Enhancement Course

Subject Title		**English-IV**		
Subject Ref. No.		**BCA410T**	**No. of Credits**	**3**
			No. of Periods / Week	**3**
			Total periods	**45**
			Assignments / Sessional	**20**
			Semester Examination	**30**

Course Objectives

1)	To make students appreciate the importance of signs and symbols in communication and enable students to understand the process of communication
2)	To highlight the importance of proficiency in speaking a language in different domains. To help students differentiate among the various domains on the basis of language.
3)	Familiarize learners with the importance of listening skills • Provide an overview of different types of listening skills • Introduce some useful strategies for effective listening
4)	To build upon students' Grammatical command on English Language for enhancement of their receptive and productive skills.

Course Outcomes (COs)

At the end of the course, students will be able to:

CO-1	The students are expected to realize their conscious and unconscious mistakes and apply these strategies to know how to be effective listener in their day-to-day life
CO-2	To describe different types methods of communicationto learners.
CO-3	Upon completion of the course the students are able to identify different types of listening and reading. They can use each listening and reading type based on their need and context.
CO-4	The students would be able to use their applied knowledge in various fields.
CO-5	The Learner's Community would be able to write text in an appropriate style, write Complex reports, letters and present a case with an effective logical structure and review any professional or literary work of art, develop knowledge about computer assisted language learning and its application.

Pre Requisite			Number of Lectures
Unit – I		**The Communication Process** Introduction, Objectives, The Communication Process, Definitions, Signs and Symbols, The Process of Communication, Models of Communication, Principles of Communication	**10**
Unit – II		**Methods of Communication** Verbal communication, Oral communication, written communication, Body language, Graphics.	**10**
Unit – III		**Channel of Communication** External, Outward and Inward, Internal, Formal channels, vertical, Horizontal, Consensus, Informal channel, Grapevine	**10**
Unit – IV		**Overcoming Barriers to Effective Communication** Introduction, Objectives, The Barriers to Effective Communication, Physical Barriers, Linguistic Barriers, Cultural Barriers, Psychological Barriers, Overcoming Barriers to Communication	**10**
Unit – V		**Grammar:**Nouns: Common Nouns, Proper Nouns, Singular Nouns,Plural Nouns, Possessive Nouns, Abstract Nouns, Collective Nouns, Compound Nouns, Active and Passive voice,	**05**
		Total	**45**

Assignments for Internal Assessment

1. Letter Writing 2. Writing of formal Application & Email drafting. 3. Reading Prose Lesson, Poems, Fiction, Drama 4. Seminar Presentations 5. Peer Discussions 6. Peer interaction based on task/activity 7. Appropriate usage of pauses, ellipsis, and Discourse items while speaking. 8. Developing Listening Skills 9. Listening to audio- lingual aids 10. Listening- social, political, historical and scientific speeches 11. Power point Presentation not less than 05 slides along with methods of communication	**15**
Total	**45**

Reference books	1. UrmilaRai, S.N.Rai.Business Communication. Himyalaya Publishing House,Mumbai. 2. Gibson, Jane W., and Richard M. Hodgetts. Business Communication: Skills and Strategies. New York: Harper & Row, 1990. 3. Aakash, Verbal & Non-Verbal Communication. Delhi: Aman Publications, 2010.	