



**GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,
KABLANA
(JHAJJAR)
An Autonomous Institute (UGC)**

‘A’ GRADE ACCREDITED BY NAAC

**Evaluation Scheme and Syllabus for
Bachelor of Computer Applications
BCA/BCA (Honours) / BCA (Honours with Research) and Specialization in**

- (i) AI & ML**
- (ii) Data Science**

Based on AICTE Curriculum and Credit Framework for BCA Program and Formative Assessment Guidelines under NEP-2020)

(With effect from the Session 2025-26)



Approved by AICTE, New Delhi and Affiliated to MDU, Rohtak

GENERAL COURSE STRUCTURE & THEME

1. DEFINITION OF CREDIT:

1	1 Hr. Lecture (L) per week	1 Credit
2	1 Hr. Tutorial(T) per week	1 Credit
3	1 Hr. Practical(P) per week	0.5Credit
4	2 Hr. Practical(P) per week	1 Credit

2. COURSE CODE AND DEFINITION:

Course code	Definitions
L	Lecture
T	Tutorial
P	Practical
DSC	Discipline- Specific Courses (Core Courses)
AEC	Ability Enhancement Courses
MDC	Multi-Disciplinary Elective Course
VAC	Value Added Courses
SEC	Skill Enhancement Courses
DSE	Discipline Specific Elective
OE	Open Elective
LC	Lab Courses

COURSE NAME: Bachelor in Computer Application, Bachelor in Computer Application (Honours) and Bachelor in Computer Application (Honours with Research)

COURSE LEVEL/ DURATION/SYSTEM:

Undergraduate / Three or Four years/ 6 or 8 Semesters with multiple entry and exit. The following option will be made available to the students joining BCA Research Program:

- One Year:** Under Graduate Certificate in Computer Application
- Two Years:** Under Graduate Diploma in Computer Application
- Three years:** Bachelor in Computer Application(BCA)
- Four years:** Bachelor in Computer Application with Honours: BCA (Honours) or Bachelor in Computer Application Honours with Research: BCA (Honours with Research)

MINIMUM ELIGIBILITY CRITERIA:

Minimum eligibility criteria for opting the course in the fourth year will be as follows:

- BCA (Honours with Research):** BCA Degree
- For BCA (Honours) :** BCA Degree

Note: The students who are eligible for BCA (Honours with Research) shall have choice to pursue either BCA (Honours) or BCA (Honours with Research).

SEMESTER WISE CREDIT DISTRIBUTION:

SEMESTER WISE CREDIT DISTRIBUTION OF PROPOSED [BCA/BCA (HONOURS)/ BCA (HONOURS WITH RESEARCH)] PROGRAM:

Semester	Core Courses	Ability Enhancement Courses	Multi-Disciplinary Elective Course	Value Added Courses	Skill Enhancement Courses	Discipline Specific Elective	Total
I	8	2	2	2	7	-	21
II	14	-	-	2	5	-	21
III	11	0	0	2	4	3	20
IV	15	0	0	0	2	3	20
V	0	0	0	0	6	15	21
VI	4	1	0	0	4	10	19
TOTAL							122*
*Minor Variation are allowed as per the need of program.							
BCA (Honours)							
VII	5	0	3	0	4	8	20
VIII					8	12	20
BCA (Honours with Research)							
VII	12					8	20
VIII	20						20

Category-Wise Distribution

Description	Core Courses	Ability Enhancement Courses	Multi- Disciplinary Elective Course	Value Added Courses	Skill Enhance-ment courses	Discipline Specific Elective	Total
BCA	52	3	2	6	28	31	122
BCA (Honours)	57	3	5	6	40	51	162
BCA (Honours with Research)	84	3	2	6	28	39	162
3 Years BCA Program					Total Credits=122*		
4 Years BCA (Honours) and BCA (Honours with Research)					Total Credits=162*		

Note: Students can take extra credit course from their own department or from other department as per the Institute norms.

Scheme of Studies and Examination
BCA –1st Semester
w.e.f. 2025-26

Sr. No.	Category	Course Code	Course Title	Hours per Week			Total Load Per Week	Credits	Examination Schedule (Marks)			
				L	T	P			Assessment	End Semester Exam	Practical	Total
1	Core Courses	DSC-BCA-101B	Mathematical Foundations of Computer Science	4	0	0	4	4	30	70	-	100
2	Skill Enhancement Courses	SEC-BCA-103B	Computer Fundamental and Problem-Solving using C	3	0	0	3	3	25	50	-	75
		LC-BCA-105B	Computer Fundamental and Problem-Solving using C Lab	0	0	2	2	1	10	-	15	25
3	Core Courses	DSC-BCA-107B	PC Software	3	0	0	3	3	25	50	-	75
		LC-BCA-109B	PC Software Lab	0	0	2	2	1	10	-	15	25
4	Skill Enhancement Courses	SEC-BCA-111B	Internet & Web Design	1	0	0	1	1	-	25	-	25
		LC-BCA-113B	Internet & Web Design Lab	0	0	4	4	2	15	-	35	50
5	Multidisciplinary Courses	Refer Table No.- I		2	0	0	2	2	50	50	-	100
6	Ability Enhancement Courses	AEC-101B	General English-I	1	1	0	2	2	65	35	-	100
7	Value Added Courses	VAC-113B	Environmental Studies	2	0	0	2	2	65	35	-	100
8	Additional Course	Refer Table No.- II	(Additional Course) Foreign Language (To be decided by the Institute/College at their level) (1-1-0) OR Any Course of Similar Credits on Any Foreign Languages from SWAYAM portal	1	1	0	2	0	-	-	-	-
Total Credits								21	295	315	65	675

Note:

1. The duration of all the end-term theory examinations shall be 3 hours.
2. The Criteria for awarding the formative assessment for Core Courses and Skill Enhancement Courses for 1st semester shall be as under:

a) Sessional Examination: 50 %

b) Assignments/ Presentations/ Seminars and Class Participation: 30%

c) Attendance: 20%

(Less than 65% - 0 marks; Up to 70% - 2 marks; Up to 75% - 3 marks; Up to 80% - 4 marks; above 80% - 5 marks)

3. The panel of examiners for end-semester theory examinations shall be prepared and approved by the BOS, comprising internal and external examiners based on their expertise, specialization, and area of interest.

4. The formative assessment criteria for Multi-Disciplinary Course in Semester I will be as follows

Sessional Test	20 Marks
Assignment/ Case Study/ Mini Project	15 Marks
Quiz/ Group Discussion/ Debate	10 Marks
Attendance (Criteria as mentioned above in 2(c))	05 Marks

5. The formative assessment criteria for **Ability-Enhancement Course** in Semester I will be as follows:

Sessional Test	30 Marks
Peer Discussion/ Debate/ Extempore Speech	10 Marks
Role Play	05 Marks
Assignment/Essay/ Article/ Report Writing	15 Marks
Attendance (Criteria as mentioned above in 2(c))	05 Marks

6. The formative assessment criteria for **Value Added Course** in Semester I will be as follows:

Sessional Test	30 Marks
Class Assignment/ Case Study/ Mini Project	15 Marks
Quiz/ Seminar/ Group Discussion/ Debate	15 Marks
Attendance (Criteria as mentioned above in 2(c))	05 Marks

7. An ‘**Additional Course**’ is a non-credit course that is undertaken for learning purposes only. If completed, the ‘**Additional Course**’ may be recorded and will be assessed on a **Grading** basis.

Marks (%)	Letter Grade	Grade Point
>90	O(Outstanding)	10
>75 to 90	A+(Excellent)	9
> 65 to 75	A(Very good)	8
>55 to 65	B+(Good)	7
> 50 to 55	B(Above average)	6
> 40 to 50	C(Average)	5
40	P (Pass)	4
Less than 40	F(Fail)	0
-	Ab(Absent)	0

Evaluation Scheme for Practical/Lab Examination: 25Marks

		Marks Distribution
Program 1	Flowchart/Algorithm	01
	Writing Program	01
	Execution and ProgramFormat	02
Program 2	Flowchart/Algorithm	01
	Writing Program	01
	Execution and Program Format	02
Viva Voce		07
Practical File*		05
Attendance*		05
Total		25

*Marks to be given by internal teacher.

Evaluation Scheme for Practical/Lab Examination: 50Marks

		Marks Distribution
Program 1	Flowchart/Algorithm	02
	Writing Program	03
	Execution and Program Format	05
Program 2	Flowchart/Algorithm	02
	Writing Program	03
	Execution and Program Format	05
Viva Voce*		20
Practical File*		10
Attendance*		05
Total		50

*Marks to be given by internal teacher.

Semester-I
Table No. I (Multidisciplinary Courses)

S. NO.	Category	Course Code	Course Name
1	Multidisciplinary Courses	MDC-BBA-101B	Foundations of Management
2	Multidisciplinary Courses	MDC-ASH-103B	Introductory Mathematics
3	Multidisciplinary Courses	MDC-105B	Indian Vision for Human Society
4	Multidisciplinary Courses	MDC-107B	Indian Culture and Civilization
5	Multidisciplinary Courses	MDC-109B	Indian Science, Engineering and Technology
6	Multidisciplinary Courses	MDC-111B	Indian Town Planning and Architecture
7	Multidisciplinary Courses	MDC-113B	Indian Health, Wellness and Psychology

Table No. II Additional Course

S. No.	Category	Course Code	Course Name
1	Additional Course	AEC-103B	French

Course Code	DSC-BCA-101B				
Category	Core Courses				
Course Title	Mathematical Foundation of Computer Science				
Scheme and Credits	L	T	P	Credits	Semester-I
	4	0	0	4	
Course Objectives	The objectives of this course are to • Build a strong mathematical foundation of computer science. • Learn different concepts such as sets, functions, matrices, determinants, limits, differentiation, and statistics for effective problem-solving and analysis.				
Assessment	30 Marks				
End Semester Examination	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Recall and define fundamental concepts of sets, functions, trigonometry, limits, differentiation, matrices, and determinants.	Level-1 Remember
CO2	Explain and interpret the relationships between mathematical concepts and demonstrate basic Understanding of functions and their applications.	Level-2 Understand
CO3	Apply mathematical principles to solve problems involving sets, functions, differentiation, trigonometry, matrices, and determinants.	Level-3 Apply
CO4	Analyze mathematical problems, identify patterns, and breakdown complex concepts into simpler Components using algebraic methods.	Level-4 Analyze

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 7 parts of 2 marks each from all units and remaining 8 questions of 14 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

Unit-I

Sets: Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian product, Cardinality of Set, Practical applications of set theory.

Relations And Functions: Relations, Equivalence Relation, Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions.

Unit-II

Trigonometry: Introduction, Measurement of angles, trigonometric functions, relation between trigonometric functions, signs of trigonometric functions, trigonometric functions of standard angles. Basic of inverse trigonometry.

Limits & Continuity: Limit at a Point, properties of limit, computation of limits of various types of functions, Continuity of a function at a point, Continuity over an interval.

Unit-III

Differentiation: Derivative of a function, Derivatives of sum, differences, product & quotient of functions, Derivatives of polynomial, trigonometric, exponential, logarithmic, inverse trigonometric and implicit functions, Logarithmic Differentiation, Chain rule and differentiation by substitution.

Unit-IV

Matrices: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices. Adjoint of matrix, Inverse of matrix, solving a system of linear equations using matrix method.

Determinants: Definition, Minors, Cofactors, Properties of Determinants, Applications of determinants in finding area of triangle.

Suggested Readings:

- Business Statistics Gupta by S. P. & M. P. Gupta,
- An Introduction to Statistical Methods by Gupta, C.B.,
- A Text Book of Business Mathematics Reddy by R. Jaya Prakash, Y. Mallikarjuna Reddy, Ashish Publishing House, New Delhi.
- Business Mathematics by JanardanDinodia and Dr. DalipKumar, Jeevansons Publications New Delhi.

Useful Video Links:

Unit No.	Topics	Links
Unit-I	Set Theory	https://youtube.com/playlist?list=PLEHGYFbPuuMEMCD8hwgnsZS0xKd8ydie&si=wr6io6TNmtN9CNsa
Unit-II	Trigonometry	https://www.youtube.com/watch?v=F2NqTiej98Q
	Limits & Continuity	https://www.youtube.com/watch?v=tfirtzUhmw&list=PL7oBzLzHZ1wXBSiJEgqz_iwVoLiY8qhbv
Unit-III	Differentiation	https://www.youtube.com/watch?v=N2PpRnFqnqY
Unit-IV	Matrices	https://www.youtube.com/watch?v=T7I_C_IL75I
	Determinants	https://www.youtube.com/watch?v=7SQbz96xUyg

Course Code	SEC-BCA-103B				
Category	Skill Enhancement Courses				
Course Title	Computer Fundamental and Problem-Solving Using C				
Scheme and Credits	L	T	P	Credits	Semester-I
	3	0	0	3	
Course Objectives	The objectives of this course are to • Develop problem-solving skills by applying logical thinking to write efficient C programs. • Study about how to work with files for input/output operations in C.				
Assessment	25 Marks				
End Semester Examination	50 Marks				
Total	75 Marks				
Duration of Exam	03 Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Recall key concepts related to computer fundamentals, programming techniques, data structures, and System components.	Level-1 Remember
CO2	Explain the functioning of computer systems, programming concepts, decision-making structures, And basic data handling techniques in C.	Level-2 Understand
CO3	Apply programming skills in C to solve computational problems, manipulated at a structures, and Implement algorithms effectively.	Level-3 Apply
CO4	Analyze complex programming problems, identify appropriate solutions, and breakdown problems into sub-tasks using logical structures and functions.	Level-4 Analyze

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 5 parts of 2 marks each from all units and remaining 8 questions of 10 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

Unit-I

Computer Fundamentals: Generations of Computers, Block Diagram along with its components, classification of computers, Applications of computers in various fields. Input/output Devices, Memory: Concept of primary & secondary memory, Cache Memory, Secondary storage devices.

Overview of Networking & Operating System: Introduction to computer networking, Network types, Network topologies, Internet and its applications, Operating system and its functions.

Unit-II

Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Techniques of Problem Solving, Documentation, Algorithms, flowchart, decision tables, pseudo code.

Overview of C: History of C, Importance of C, Elements of C: C character set, identifiers and keywords, Data types, Constants and Variables, Assignment statement, Symbolic constant, Structure of a C Program,

printf(), scanf() Functions, Operators & Expression, type casting and conversion, operator hierarchy & associativity.

Unit-III

Decision making & Branching: Decision making with IF statement, IF-ELSE statement, Nested IF statement, ELSE-IF ladder, switch statement, go to statement.

Decision making & Looping: while, do-while and for loop, jumps in loops, break, continue statement, Nested loops

Functions: Standard Mathematical functions, Input/output: Unformatted & formatted I/O function in C, Input functions output functions, string manipulation functions User defined functions, Introduction/Definition, function prototype, Local and global variables, passing parameters, recursion.

Unit-IV

Arrays & Pointers: Definition, types, initialization, processing an array, passing arrays to functions, Declaration and initialization of string, Input/output of string data, Introduction to pointers.

Structure & Union: Structure definition, Declaration, structure Assignments, Arrays in structure, Structure Arrays, Pointer Structure, Nested Structure, Arrays and Arrays of Structure, Union and File Handling.

Suggested Readings:

- Programming with C by Gottfried, Byron S., and Tata Mc GrawHill.
- Computing Fundamentals and Programming in C by Gill Nasib Singh, Khanna Books Publishing Co. New Delhi.
- Programming in ANSIC by Balagurusamy, E., 4E, Tata Mc Graw-Hill.
- Problem Solving and Program Design in C by Jeri R. Hanly& Elliot P. Koffman, Addison Wesley.
- Let us C by Yash want Kanetker, BPB.
- Computer Programming in C by Rajaraman, V., PHI.
- Working with C by Yash want Kanetker, BPB.

Useful Video Links:

Unit No.	Topics	Links
Unit-I	Generations of Computers	https://archive.nptel.ac.in/courses/106/105/106105163/
	Introduction to computer networking	https://archive.nptel.ac.in/courses/106/105/106105183/
	Introduction to operating system	https://archive.nptel.ac.in/courses/106/105/106105214/
Unit-II	Algorithm & Flow Chart	https://www.youtube.com/watch?v=5AHRXOtn9bY
	Introduction To C Programming	https://www.youtube.com/watch?v=IoT0zP4YIMk
Unit-III	Conditional Control Statements&Loops	https://www.youtube.com/watch?v=HyDpW7Al6_E
	Call By value & Call By reference	https://www.youtube.com/watch?v=1iwmwEJhcMw
Unit-IV	Introduction to Array	https://www.youtube.com/watch?v=I9828WOCEMg
	String	https://www.youtube.com/watch?v=rcGeNI95Gv4
	Structures	https://www.youtube.com/watch?v=kDDd7AmXq1w

Course Code	LC-BCA-105B				
Category	Skill Enhancement Courses				
Course Title	Computer Fundamental and Problem Solving Using C Lab				
Scheme and Credits	L	T	P	Credits	Semester-I
	0	0	2	1	
Course Objectives	The objectives of this course are to • Equip students with the ability to write correct and well-structured C programs. • Enhance student’s logical thinking and problem-solving abilities.				
Assessment	10 Marks				
End Semester Examination	15 Marks				
Total	25 Marks				
Duration of Exam	03 Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT LEVEL
CO1	Write and execute C programs to perform operations like sum, finding largest number, swapping values, and using recursion and iteration.	Level-3 Analyze
CO2	Analyze and debug C programs to identify logical errors, optimize code, and ensure correctness in Solving problems like Fibonacci series and arrays.	Level-4 Apply
CO3	Evaluate the efficiency and correctness of functions, mathematical operations ,string manipulations, and memory management techniques in C.	Level-5 Evaluate
CO4	Design and develop complex C programs using arrays, functions, pointers, structures, and file Handling techniques to solve real- world problems.	Level-6 Create

Exp. No.	Contents
1.	Introduction to the programming environment (Turbo C IDE).
2.	Write a C program to calculate the sum of two numbers.
3.	Write a C program to find the largest of three numbers using if-else statements
4.	Write a program to swap the values of two given variables.
5.	Apply the concepts of recursive functions to solve problems like factorial, Fibonacci series.
6.	Apply the concepts of Iteration to solve problems e.g., sum of series.
7.	Apply the concepts of arrays for 1D & 2D Array manipulation
8.	Apply various string manipulation functions.

9.	Apply the concepts of functions, call by value & call by reference.
10.	Apply various mathematical functions like abs(), pow(), sqrt() floor(), etc.
11.	Apply the concepts of pointers, structures and dynamic memory allocation.
12.	Analyze the concept of file handling techniques and their operations

Useful Video links:

Experiment no.	Experiment name	Links
1	Calculate the sum of two numbers.	https://www.youtube.com/watch?v=s4EiG4RXwyU
2	Find the largest of three numbers using If-else statements.	https://www.youtube.com/watch?v=HyDpW7Al6_E
3	Recursive functions to solve problems Like factorial, Fibonacci series.	https://www.youtube.com/watch?v=LoIe_9cTtPE
4	Arrays for 1D & 2D Array manipulation.	https://www.youtube.com/watch?v=I9828WOCEMg
5	Pointers, structures and dynamic Memory allocation.	https://www.youtube.com/watch?v=Z_0xXmOgYtY

Course Code	DSC-BCA-107B				
Category	Core Courses				
Course Title	PC Software				
Scheme and Credits	L	T	P	Credits	Semester-I
	3	0	0	3	
Course Objectives	The objectives of this course are to • Develop a foundational understanding of MS-Windows operating system interface. • Enable students to proficiently use key office applications, including word processors, spreadsheets, and presentation software.				
Assessment	25 Marks				
End Semester Examination	50 Marks				
Total	75 Marks				
Duration of Exam	03 Hours				

Course Outcomes: After successful completion of this course, the students will be able to

Cos	Skills Demonstrated	RBT Level
CO1	Recall basic concepts of MS-Windows, word processing, spreadsheet, and presentation software Functionalities and tools.	Level-1Remember
CO2	Explain the essential functions of MS-Windows, word processing, spreadsheet, and presentation software, including their practical applications.	Level-2Understand
CO3	Apply their skills in MS-Windows, word processing, Excel, and Power Point to create and manage documents, presentations, and spreadsheets.	Level-3Apply
CO4	Analyze and organize data, documents, and presentations, determining effective layouts, formatting, And data analysis methods.	Level-4Analyze

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 5 parts of 2 marks each from all units and remaining 8 questions of 10 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

Unit-I

MS-Windows: Operating System-Definition & functions, basics of Windows. Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel – display properties, adding and removing software and hardware, setting date and time, screensaver and appearance. Using windows accessories.

Unit-II

Documentation Using word processing software: Introduction to word processing, Toolbars, Creating & Editing Document, Formatting Document and printing document, Finding and replacing text, Format painter, Header and footer, Spelling and Grammar Tool, Page Formatting, Bookmark, Mail Merge, Macros, Tables and File Management, Clipart, Templates, Tracking changes.

Unit-III

Slide based Presentation: Starting MS–Power Point, working with power point, Creating, Saving and Printing a presentation, working with Animation, adding a slide to presentation, navigating through a presentation, Slide- sorter, Slide-show, editing slides, Working with Graphics and Multimedia in Power Point (Inserting Photo, Video &Sound).

Unit-IV

Electronic Spreadsheet using Excel Workbook: Introduction to MS-Excel, Feature of MS-Excel, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, Cell referencing, Pivot table & Pivot Chart, Linking, Sorting, Filtering.

Suggested Readings:

- Learn Microsoft Office by Russell A. Stultz– BPB Publication
- Microsoft Office 2000 by Courter, G Marquis (1999), Professional Edition. BPB.
- Microsoft Office XP Fast and Easy by Koers, D (2001), PHI.
- Office XP: The Complete Reference by Nelson, S and Kelly, J (2002), Tata Mc Graw- Hill.
- Microsoft Office Complete Reference –BPB Publication.

Useful Video Links:

Unit No.	Topics	Links
Unit-I	MS-Windows	https://www.youtube.com/watch?v=DzTCFsdXMP4
Unit-II	Documentation Using word processing software	https://www.youtube.com/playlist?app=desktop&list=PLyqSpQzTE6M_Da0qvy98D8Me7MWQc78Cj
Unit-III	Slide based Presentation	https://www.youtube.com/watch?v=HyDpW7Al6_E
Unit-IV	Electronic Spreadsheet using Excel Workbook	https://www.youtube.com/watch?v=I9828WOCeMg

Course Code	LC-BCA-109B				
Category	Core Courses				
Course Title	PC Software Lab				
Scheme and Credits	L	T	P	Credits	Semester-I
	0	0	2	1	
Course Objectives	The objectives of this course are to - Equip students with hands- on experience in using various PC software applications, including word processors, spreadsheets, presentation tools. - Enable students to create, format, and edit various types of documents, applying advanced features and tools for professional presentation.				
Assessment	10 Marks				
End Semester Examination	15 Marks				
Total	25 Marks				
Duration of Exam	03 Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Apply office automation tools like MS-Word, Excel, and Power Point to create, format, and manage documents, spreadsheets, and presentations.	Level-3 Apply
CO2	Analyze data, charts, and formulas in MS-Excel, identifying patterns and drawing conclusions to Support decision-making.	Level-4 Analyze
CO3	Evaluate the effectiveness of document formatting, Excel formulas, and presentation designs, Ensuring accuracy, clarity, and professional standards.	Level-5 Evaluate
CO4	Design and create professional documents, presentations, and reports by integrating advanced Features like macros, charts, and mail merge.	Level-6 Create

Exp. No.	Contents
1.	To study about various concepts of office automation Tools.
2.	Use the concept of find and replace text in MS-Word.
3.	Use the features of Format Painter, Header and Footer, Drop Cap, Auto Text, and Autocorrect In MS-Word.
4.	Analyze the marks of the students of a class using various chart (Line, XY, Bar and Pie) With the help of MS-Excel.
5.	Evaluate the accuracy of Microsoft Excel formulas (SUM, AVERAGE, etc.) and conditional formatting.
6.	Create a professional resume using Microsoft Word, including headers, footers, and bullet points.
7.	Create a document in MS-Word with macros to automate repetitive tasks. Explain how to record and execute macros.
8.	Create personalized letter with the help of mail merge features.
9.	Design a worksheet in MS-Excel with a header and footer.
10.	Create a Microsoft Power Point presentation with various slide layouts, images, and charts.
11.	Implement slide transitions and animations in MS-PowerPoint.
12.	Design a presentation in MS-PowerPoint with Excel charts and WordArt.

Course Code	SEC-BCA-111B				
Category	Skill Enhancement Courses				
Course Title	Internet &Web Design				
Scheme and Credits	L	T	P	Credits	Semester-I
	1	0	0	1	
Course Objectives	The objectives of this course are to • Guide students in designing visually appealing and functional websites using HTML. • Enable students to apply CSS techniques for improving user experience and web accessibility.				
Assessment	-----				
End Semester Examination	25 Marks				
Total	25 Marks				
Duration of Exam	03 Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Recall key concepts related to the Internet, web browsers, HTML, CSS, web publishing, and webpage elements.	Level-1 Remember
CO2	Explain the principles of web development, including HTML, CSS, webpage structures, and the role of different web technologies.	Level-2 Understand
CO3	Apply web development techniques to create and design basic websites using HTML and CSS, integrating text, graphics, and forms.	Level-3 Apply
CO4	Analyze web design problems, evaluate design options, and implement effective solutions for layout, content, and user interaction.	Level-4 Analyze

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 5 parts of 1 mark each from all units and remaining 8 questions of 5 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

Unit-I

Introduction to Internet and World Wide Web: A brief Introduction to the Internet, Evolution of World Wide Web, Basic features, Web Browsers, Web Servers; Hypertext Transfer Protocol, URLs, Searching and Web- Casting Techniques, Search Engines and Search Tools, Domain Name System, Home Page, Web page and website.

Unit-II

Web Publishing: Hosting your Site; Internet Service Provider, Phases of Planning and designing your Web Site, steps for developing your Site, Choosing the contents

Web Development: Introduction to HTML, Hypertext and HTML; HTML Document Features; HTML command Tags; Headers; Text styles; Text Structuring; Text colors and Background; formatting text.

Unit-III

List: Ordered and Unordered lists, Table Creation and Layouts. Images; Inserting Graphics; Frame Creation and Layouts; Creating Links; Working with Forms and Menus; Working with Radio Buttons and Check Boxes; Text Boxes; Page layouts.

Unit-IV

Cascading Style Sheets (CSS): Basic Concepts, Properties, Creation of Style Sheets. Common Tasks with CSS: Text, Fonts, Margins, Links, Tables, Colors. Marquee. Mouse Overs. Filters and Transitions. Adding Links. Adding Tables. Adding Forms. Adding Image and Sound. Use of CSS in HTML Documents, Linking and Embedding of CSS in HTML.

Suggested Readings:

- Fundamentals of the Internet and the World Wide Web by Raymond Green law and Ellen Hepp– 2001, TMH.
- Internet & World Wide Programming by Deitel& Nieto, 2000, Pearson Education.
- Web Technologies by Uttam K. Roy, Oxford University Press.
- HTML Black Book by Stephen Holzner, Wiley Dream tech.
- Web Technology by Rajkamal, Tata McGraw-Hill.

Useful Video Links:

Unit No.	Topics	Links
Unit-I	Introduction To Internet	https://www.youtube.com/watch?v=YOXwcbwSEUo
	Internet and www	https://www.youtube.com/watch?v=-2hpoljNSb4
Unit-II	Web Development	https://www.youtube.com/watch?v=QEtWL4lWlL4
Unit-III	List and table creation	https://www.youtube.com/watch?v=omuyzDmNaf4
Unit-IV	Cascading style sheets	https://www.youtube.com/watch?v=h_RftxdJTzs

Course Code	LC-BCA-113B				
Category	Skill Enhancement Courses				
Course Title	Internet &Web Design Lab				
Scheme and Credits	L	T	P	Credits	Semester-I
	0	0	4	2	
Course Objectives	The objectives of this course are to • Create structured and well-formatted web pages using HTML, incorporating various elements such as text, images, links, lists, tables, and forms. • Use CSS to make web pages look attractive by adding colors, fonts, and layouts.				
Assessment	15 Marks				
End Semester Examination	35 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Course Outcomes: After successful completion of this course, the students will be able to

Cos	Skills Demonstrated	RBT Level
CO1	Write and implement HTML programs to create headings, insert images, format text, change background, and design forms.	Level-3 Apply
CO2	Analyze the application of different style sheets (inline, internal, external) in web pages and evaluate their impact on design.	Level-4 Analyze
CO3	Evaluate the usability and effectiveness of HTML forms for user interaction and assess their Integration into web pages.	Level-5 Evaluate
CO4	Design and develop multi-page websites using HTML, incorporating tables, lists, forms, framesets, and linked pages for user navigation.	Level-6 Create

Exp. No.	Contents
1.	To study the basic Structure of HTML.
2.	Write a program to use Heading Element in HTML.
3.	Write a program to insert image in HTML.
4.	Write a program to use Formatting text in HTML.
5.	Write a program for changing Background and Style.
6.	Analyze the use of various types of style sheets in a web page (inline, internal and external style sheets).
7.	Evaluate the usability of the form for user interaction.
8.	Write a program to Create a Table in HTML.
9.	Write a program to Create list in HTML.
10.	How to implement Frame set in HTML.
11.	Write a program to Design a student registration and Log-in form.
12.	Create a simple multi-page website with linked HTML pages.

Useful Video links:

Experiment no.	Experiment name	Links
1	Basic Structure of HTML.	https://www.youtube.com/watch?v=QEtWL4lWlL4
2	Program to use Heading Element inHTML.	https://www.youtube.com/watch?v=omuyzDmNaf4
3	Program to insert image in HTML.	https://www.youtube.com/watch?v=zGedWVlx6hQ
4	Program to Create a Form in HTML.	https://www.youtube.com/watch?v=TeV2eDHtVa0
5	Program to Create a Table in HTML.	https://www.youtube.com/watch?v=WRdTXaz4_Ls

Course Code	MDC-BBA-101B				
Category	Multidisciplinary Courses				
Course Title	Foundations of Management				
Scheme and Credits	L	T	P	Credits	Semester-I
	2	0	0	2	
Course Objectives	The objectives of this course are to • Help the students develop fundamental and transfer able skills in order to become effective managers. • The students will understand how planning, organizing, and controlling Have impacts on a manager’s effectiveness and efficiency.				
Assessment	50 Marks				
End Semester Examination	50 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Recall key concepts of management, including managerial levels, functions, planning, organizing, controlling, and decision-making processes.	Level-1Remember
CO2	Explain the nature and purpose of management, various planning and decision-making processes, and the significance of control techniques in organizations.	Level-2Understand
CO3	Apply management principles to real-world scenarios, demonstrating effective decision-making, organizational structuring, and control techniques in different business contexts.	Level-3Apply
CO4	Analyze management problems, assess organizational structures, and evaluate strategies and control systems to improve business performance.	Level-4Analyze

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 5 parts of 2 marks each from all units and remaining 8 questions of 10 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

Unit-I

Overview of Management: Concept, Nature, Process, Managerial levels (Technical, Conceptual, Interpersonal), Skills, Functions and Role of managers, Challenges of Management.

Unit-II

Planning: Nature and purpose of planning, Planning process, Types of plans, Management by Objectives (MBO), Strategies, types of strategies (Corporate Strategy, Business Strategy, Differentiation Strategy, Retrenchment Strategy, Growth Strategy), Decision making: Types of

decision, Decision making process, Rational decision making.

Unit-III

Organizing: Meaning, Nature and purpose of organizing, organization structure, Departmentation, Span of control, Centralization and Decentralization, Delegation of authority and responsibility.

Unit-IV

Controlling: Meaning, Nature and scope of control, Types of control, Control process, Control techniques (Budgetary Control, Financial Control, Quality Control, Inventory Control, Statistical Control, Production Control), Cost Control, Effective control system.

Suggested Readings:

- Management Theory and Practice by C. B. Gupta, Sultan Chand and Sons
- Essentials of Management by Koontz and Wehrich, Tata McGraw-Hill
- Management: Concepts and Strategies by J. S. Chandan, Vikas Publishing House, New Delhi
- Management by Robbins and Coulter, Prentice Hall of India, New Delhi
- Developing Communication Skills by Krishna Mohan and Meera Banerji, Macmillan India Ltd., New Delhi
- Management and Organizational Behavior by Wendy Blaoisi, Curtis W. Cook, and Phillip L. Hunsaker, McGraw Hill

Useful Video Links:

Unit No.	Topics	Links
Unit-I	Introduction to Management	https://youtu.be/TtbImDfUt4c?feature=shared
Unit-II	Decision Making	https://youtu.be/B96-Gpn56sU?feature=shared
Unit-III	Delegation Of Authority	https://youtu.be/GILXV7JLVnk?feature=shared
Unit-IV	Controlling: Issues, Types, Techniques and Importance	https://youtu.be/v7XmhnenEGs?feature=shared

Course Code	AEC-101B				
Category	Ability Enhancement Course				
Course Title	General English-I				
Scheme and Credits	L	T	P	Credits	Semester-I
	1	1	0	2	
Course Objectives	The objectives of this course are • To build a strong foundation in Basic English grammar, including parts of speech, subject-verb agreement, and determiners. • To understand the communication process, barriers, and types of communication, while developing strategies for effective interaction. • To develop listening, speaking, and reading skills, focusing on active listening, public speaking, and voice modulation. • To gain proficiency in writing notices, memos, circulars, and business letters with correct structure and layout.				
Assessment	65 Marks				
End Semester Examination	35 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Explain the basics of English grammar and communication for effective interactions.	Level-1Remember
CO2	Describe the parts of speech, communication barriers, listening strategies and Frame technical documents.	Level-2Understand
CO3	Apply grammar rules, communication principles and skills in personal and Professional contexts.	Level-3Apply
CO4	Apply the knowledge of grammar and LSRW skills to communicate effectively.	Level-3Apply

Note: Examiner will set nine questions in total. Question one will have 07 short questions of 1 mark (each) from all units. Remaining eight questions of 7 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first question being compulsory and selecting one from each Unit. At least four cases will be discussed, one from each unit.

Unit-I

Basics of English Grammar: Parts of Speech, Conjunction, Prepositions, Articles, Subject-Verb Agreement and Noun-Pronoun Agreement, Determiners.

Unit-II

Basics of Communication: Definition, Nature, Importance of Communication, Communication Process ,Barriers to Effective Communication and Overcoming Strategies,Types of Communication, Communication Networks.

Unit-III

Enhancing LSRW Skills: Listening Skills, Cognitive Process of Listening, Types of Listening, Active ListeningTechniques, Barriers to Effective Listening, Speaking Skills, Public Speaking, Voice Modulation, Reading Skills.

Unit-IV

Technical Writing: Notices, Memo, Circulars, Structure and Layout of Business Letters, Structure, Layout and Types of Letters.

Suggested Readings:

- Business Communication Process and Product by Mary Ellen Guffey and Dana Loewy, Cengage Learning
- Effective Communication Skill by John Nielsen, NTC/Contemporary Publishing Company
- Public Speaking for Success by Dale Carnegie, Per Capita Publishing
- Word Power Made Easy by Norman Lewis, Goyal Publishers & Distributors PvtLtd.
- English Grammar in Use by Raymond Murphy, Cambridge University Press

Useful Video Links:

Unit No	Topics	Links
Unit-I	Basics of English Grammar	https://youtu.be/3oIAICs8N9I?si=B
Unit-II	Basics of Communication	https://youtu.be/J3oVY0O4PYk?si=3a5hO-SUGa5H-ZDQ
Unit-III	Enhancing LSRW Skills	https://youtu.be/yyUiEp5ny_Y?si=o0VkCYDW4EP4v3PD
Unit-IV	Technical Writing	https://www.youtube.com/watch?v=BO7j-X87rM8

Course Code	VAC-113B				
Category	Value Added Course				
Course Title	Environmental Studies				
Scheme and Credits	L	T	P	Credits	Semester-I
	2	0	0	2	
Course Objectives	The objectives of this course are • To understand the basics of environmental studies, ecosystems, and sustainability. • To explore renewable and non-renewable resources, their issues, and conservation strategies. • To understand biodiversity, its value, threats, and conservation methods. • To understand pollution, climate change and solutions for environmental disasters.				
Assessment	65Marks				
End Semester Examination	35 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Course Out comes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Recall key environmental concepts and principles.	Level-1Remember
CO2	Describe the environment, sustainability, natural resources, biodiversity, pollution and disaster.	Level-2Understand
CO3	Apply environmental knowledge to propose solutions for sustainable practice , Conservation of natural resources, pollution control and disaster management.	Level-3Apply
CO4	Analyze the structure and function of ecosystem, effect of human activities on Natural resources, types of biodiversity and role of individual in environment pollution.	Level-4Analyze

Note: Examiner will set nine questions in total. Question one will have 7 short questions of 1 mark (each) from all units. Remaining eight questions of 7 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total; first question is compulsory and selecting one from each Unit.

Unit-I

Introduction to Environmental Studies: Multidisciplinary Nature of Environmental Studies, Scope and Importance, Concept of Sustainability and Sustainable Development, Ecosystem, Introduction, Characteristic and Features, Structure and Function of the following Ecosystem-Forest Ecosystem, Aquatic Ecosystems (Ponds, Lakes, Rivers, Oceans).

Unit-II

Renewable and Non-renewable resources: Natural Resources and Associated Problems, Forest Resources – (Use and Over-Exploitation, Deforestation, Timber Extraction, Mining, Dams and their Effects on Forestland Tribal People), Water Resources – (Use and Over-Utilization of Surface and Ground Water, Floods, Drought, Conflicts Over Water, Dams Benefits and Problems), Land Resources–(Land as a Resource, Land Degradation, Role of an Individual in Conservation of Natural Resources).

Unit-III

Biodiversity and its Conservation: Introduction, Genetic, Species and Ecosystem Diversity, Biogeographically Classification of India, Value of Biodiversity, Consumptive Use, Productive Use, Social Use, Ethical Use, Threats to Biodiversity, Habitat Loss, Poaching of Wildlife, Man Wildlife Conflicts, Conservation of Biodiversity: Benefits and Name of the Methods of in-Situ and Ex-Situ Conservation of Biodiversity.

Unit-IV

Environmental Pollution: Definition, Causes, Effects and Control Measures of (Air Pollution and Water Pollution), Role of an Individual in Prevention of Pollution, Disaster Management: Meaning, Reason and Solutions of Floods, Earthquake, Cyclone and Landslides, Meaning of Climate Change, Reasons and Solution to Greenhouse Gases, Acid Rain and Global Warming.

Suggested Readings:

- Text Book of Environmental Studies by D.K.Asthana, S.ChandPublishing.
- Fundamentals of Environmental Studies by M.Basu, S.Xavier, Cambridge University Press.
- Environment, edited by R.N.Basu, University of Calcutta, Kolkata.
- Environmental Science by T.O.Miller Jr., Wads worth PublishingCo.
- EnvironmentalManagementbyK.D.Wagner,W.B.SaundersCo.,Philadelphia

Useful Video Links:

Unit No	Topics	Links
Unit-I	Multidisciplinary nature of environmentalStudies	https://nptel.ac.in/courses/122102006
Unit-II	Renewable and non-renewable resources	https://archive.nptel.ac.in/courses/121/106/121106014
Unit-III	Biodiversity and its conservation	https://nptel.ac.in/courses/129105008
Unit-IV	Environmental Pollution	https://archive.nptel.ac.in/courses/123/105/123105001/

Course Code	AEC-103B				
Category	Ability Enhancement Course				
Course Title	French Language				
Scheme and Credits	L	T	P	Credits	Semester-I
	1	1	0	2	
Course Objectives	The objectives of this course are • To understand foundational language skills necessary for basic communication, including introducing themselves and others, describing places, and talking about their surroundings. • To focus on enhancing students' ability to express personal likes, interests, and other simple ideas, ensuring their ability to engage in basic communicative transactions. • To achieve a partial A1 level by the end of the semester according to the Common European Framework, which will enable them to handle simple communication in everyday situations.				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Define key concepts related to reading, listening, speaking, and writing in English, focusing on every day communication.	Level-1Remember
CO2	Explain basic communication techniques for understanding texts, listening to Simple conversations, and expressing oneself in writing.	Level-2Understand
CO3	Apply reading skills to use simple texts (e.g., notices, short passages, emails) and extract relevant information to answer questions or complete given tasks.	Level-3Apply
CO4	Apply listening skills to understand simple conversations or audio messages and respond appropriately by completing activities such as answering questions or writing brief personal messages.	Level-3Apply

Unit-I

Reading: Reading Simple Texts Related to One's Immediate Environment such as Notices, Posters, Catalogs, Fliers, Personal Messages or Emails and Answering Questions on them.

Unit-II

Listening: Understanding familiar Words and very Basic Phrases about Oneself, One's Family, and Immediate Concrete Surroundings, such as Very Brief Announcements in Public Spaces, Short, Simple Formal/Informal Conversation, Questions and Instructions. When Speakers are speaking at a Slower Pace.

Unit-III

Writing: Guided Writing will include activities such as, filling a Form, Writing Simple Phrases (Postcards, Messages, Invitations etc.) on everyday Topics.

Unit-IV

Speaking: Monologue: Describing and presenting oneself, one's Immediate Environment and the People S/He Knows Using Simple Phrases and Sentences.

Dialogue: Taking part in a Conversation and Interaction in a Simple way provided the other Person is prepared to repeat or to Rephrase more slowly and help Formulate what s/he is trying to say asking simple Questions on familiar Topics or Matters related to one's Immediate Environment. Making simple Purchases in Shops or Obtaining Services that one requires.

Suggested Readings:

- Kizirian, V. M, Daill, E., Berthet, A., Hugot, C., Waendendries, M. Alter Ego + 1. Paris: Hachette.
- Berthet, A., Daill, E., Hugot, C., Waendendries, M. Alter Ego + 1, Cahierd' activités. Paris: Hachette.
- Hachette, Y., Mérieux, R. Latitudes 1, (Livredel' élève& Cahierd' exercices). Paris: Didier.
- Cocton, M-N., Dupleix, D., Heu, E., Kasazian, E., Ripaud, D. Saison 1, (Livredel' élève& Cahier d' exercices). Paris : Didier.
- Denyer, M., Garmendia, A., Lions-Olivieri, M-L. Version Originale 1, Livredel' élève. Paris: Editions Maisonsdes Langues.
- Magne, M., Lions-Olivieri, M-L. Version Originale 1, Cahierd' exercices. Paris: Editions Maisonsdes Langues.

Useful Video Links:

Unit No	Topics	Links
Unit-I	French Absolute Beginners Guide	https://www.youtube.com/watch?v=Sk6YQynZ1h8
	Learn how to read in French	https://www.youtube.com/watch?v=sSCEoAWw0q4
Unit-II	French Listening Practice -50 Everyday French Sentences	https://www.youtube.com/watch?v=Aofb0XEJlks
Unit-III	Learn how to write French with me	https://www.youtube.com/watch?v=9iUiei9YMCK
Unit-IV	Slow and Easy French Conversation Practice	https://www.youtube.com/watch?v=ReVCwcHwnZI

Course Code	MDC-ASH-103B				
Category	Multidisciplinary Courses				
Course Title	Introductory Mathematics				
Scheme and Credits	L	T	P	Credits	Semester-I
	2	0	0	2	
Course Objectives	The objectives of this course are • To understand the types, representation, and operations on sets, along with the basic laws of indices. • To explore matrix operations and determinants in solving linear equations • To understand arithmetic and geometric progressions, their sums, and applications, along with some special sequences. • To understand permutation, combination and the binomial theorem • For solving problems.				
Assessment	50 Marks				
Summative Assessment	50 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Course Out comes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Recall the definitions and properties of sets, indices, matrices, determinants, sequences, series, permutations, combinations, and binomial theorem..	Level-1 Remember
CO2	Explain the operations on sets, matrix algebra, determinants, sequences, series, and the application of permutation, combination, and binomial theorem principles.	Level-2 Understand
CO3	Apply the set theory, matrix operations, determinants, sequence and series calculations, and permutation and combination techniques to solve practical problems.	Level-3 Apply
CO4	Analyze the results from set operations, matrix methods, sequences, series, permutations, and combinations to analyze their practical applications and implications.	Level-4 Analyze

Note: Examiner will set nine questions in total. Question one will have 5 short questions of 2 marks (each) from all units. The remaining eight questions of 10 marks each are to be set by taking two questions from each unit. The students have to attempt five questions in total, the first question being compulsory and selecting one from each unit.

Unit-I

Theory of Sets: Meaning and Types of Sets, Representation of Sets, Venn diagram, Operation on Sets, Union, Intersection and Complements of Sets, Cardinality of Finite Set, Practical Applications of Set Theory, Ordered Pairs, Cartesian Product of Two Sets. **Indices:** Introduction, Law of Indices.

Unit-II

Algebra of Matrices: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication, Multiplication of Matrices and Its Properties.

Determinants: Introduction, Minors, Co-Factors, Properties of Determinants, Applications of Determinants in Finding Solution of Linear Equations.

Matrices (Continued): Transpose of Matrix, Symmetric and Skew-Symmetric Matrices, Singular and Non-Singular Matrices, Adjoint of Matrix, Inverse of Matrix, Solution of System of Linear and Homogeneous Linear Equations by using Matrix Method.

Unit-III

Sequence and Series: Sequence, Series and Progression, Arithmetical Progression and Its Representation, Sum of N Terms of an A.P., Arithmetic Mean, Geometrical Progression and Sum of G.P., Geometric Mean, Application of A.P. and G.P., Some Special Sequences.

Unit-IV

Permutation and Combination: Factorial Notation, Permutation, Circular Permutation, Combination, Practical Problems on Combinations.

Binomial Theorem: Introduction, General Term, Middle Term, Absolute Term, Coefficient of Any Power of x.

Suggested Readings:

- Business Mathematics by Sancheti, D.C., A.M. Malhotra, V.K. Kapoor, Sultan Chand & Sons
- Business Mathematics by Zameerudin, Qazi, S.K. Bhambri, Vikas Publishing House Pvt. Ltd.
- Text Book of Business Mathematics by R. Jaya Prakash, Ashish Publishing House
- Business Mathematics by JanardanDinodia, Dr. Dalip Kumar, Jeevansons Publications

Useful Video Links:

Unit No	Topics	Links
Unit-I	Introduction to Set Theory	https://youtube.com/playlist?list=PLEHGYFbPuuMEMCD-8hwgnsZS0xKd8ydie&si=wr6io6TNmtN9CNsa
Unit-II	Arithmetic Progression	https://youtube.com/playlist?list=PLaAhQ2ofZZRD6WKjeCFg890_07QXWNT6i&si=uDeAM9Kq_4CZwK_K
Unit-III	Sequence and Series	https://youtube.com/playlist?list=PLVFqK_9GOGXm-Ia53fONR8XhwGknj9Z&si=YXFrCI3YdJnjYAez
Unit-IV	Permutation and Combination	https://youtu.be/iyIq1YSSA5E?si=Qukhh4uhRDgADByC

Course Code	MDC-105B				
Category	Multidisciplinary Courses				
Course Title	Indian Vision for Human Society				
Scheme and Credits	L	T	P	Credits	Semester-I
	2	0	0	2	
Course Objectives	The objectives of this course are: • To help the learner to understand the concept of “VasudhaivaKutumbkam” and its realization process as a base for the development of vision for a humane society. • To help to identify the universality in humans and its coexistence in existence. • To introduce the sense of responsibility, duties, and participation of individuals for establishment of a fearless society. • To understand the apparently rational, verifiable, and universal solution from the ancient Indian knowledge system for the holistic development of physical, mental, and spiritual wellbeing of one and all, at the level of individual, society, nation, and ultimately the whole world.				
Assessment	50 Marks				
End Semester Examination	50 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Course Outcomes: After successful completion of this course, the students will be able to

Cos	Skills Demonstrated	RBT Level
CO1	Remember core concepts related to human existence, consciousness, and social harmony.	Level-1Remember
CO2	Understand the aims of human life and the ethical foundations of individual and societal well-being	Level-2Understand
CO3	Apply philosophical and ethical principles to personal conduct and social interactions.	Level-3Apply
CO4	Apply integrated knowledge to promote harmony, balance, and purposeful living in society.	Level-3Apply

Note: Examiner will set nine questions in total. Question one will have 5 short questions of 2 marks (each) from all units. Remaining eight questions of 10 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first question being compulsory and selecting one from each Unit.

Unit-I

The World View & Vision of Human Society:The concept of non-duality of Prakriti (Jad) and Purush (Chetana), human as coexistence of Jad&Chetan, PanchaMahabhutas, the root of sorrow and suffering, freedom from sorrow, salvation, eternal peace, truth (Vyaharika Satya), ultimate truth. The acceptance of various systems of philosophy for realization of truth and complementariness in society in the ancient Indian system.

Unit-II

Aspiration and Purpose of Individual and Human Society: Aims of human life at individual level and societal level. At the societal level: Four Purusharthas — Dharma, Artha, Kama, Moksha.

At the individual level: Abhyudaya (progress), Nihisreyasa (perfection), Pravritti, Nivritti.

Dharma: Dharma Sutras (Gautama, Apastamba, Baudhayana, Vasistha).

Dharma Shastra: (Manusmriti, NaradaSmriti, Vishnu Smriti, YajnavalkyaSmriti) — sociology, different stages of life like studenthood, householdership, retirement and renunciation, rights and duties, judicial matters, and personal laws (Aachara, Vyavahara, Prayaschitta).

Artha: KautilyaArthashastra, KamandakiyaNitisaara, Brihaspati Sutra, SukraNiti.

Moksha: Human liberation (Ignorance to Knowledge).

Unit-III

Program for Ensuring Human Purpose: At Individual and Societal Level – I:

Fundamental concept of Nitishastra: Satyanishtha Aur Abhiruchi (Ethics, Integrity & Aptitude). The true nature of self: Shiksha Valli, Bhriгу Valli (concept of Atman–Brahman: self, soul). The true constitution of human: Ananda Valli (Annamaya Kosha, Pranamaya Kosha, Manomaya Kosha, Vijnanamaya Kosha, Anandamaya Kosha).

The four states of consciousness (Waking State, Dreaming State, Deep Sleep State, Turiya — the fourth state), Consciousness (seven limbs and nineteen mouths), Prajna, Awareness. The life force Prana (Prana, Apana, Vyana, Udana, Samana).

Program for Ensuring Human Purpose: At Individual and Societal Level – II:

Differentiating Vidya and Avidya, human bondages, Higher and Lower Knowledge (Para Vidya & Apara Vidya). Concept of Sattva, Rajas, Tamas and the need of balancing the same. Patanjali Yoga Sutra: Yama, Niyama, Asanas, Pranayama, Pratyahara, Dharana, Dhyana, Samadhi.

Sixteen categories of Padartha, Pramanas (Pratyaksha, Anumana, Upamana, Shabda). Sadhana Chatushtaya (Viveka, Vairagya, Mumukshatva, Shadsampatti — Sama, Dama, Uparama, Titiksha, Shraddha, Samadhana).

Understanding Nitya Karma, Naimittika Karma, Kamya Karma, Prayaschitta Karma, Nishiddha Karma. Meditation and Progressive Meditation (Narada's education), Ativadin to Self-knowledge. Jnana Yoga, Karma Yoga, Sanyasa Yoga in aspect to harmonious practice in society.

Unit-IV

Practices for Ensuring Human Purpose – III: Practice in philosophy, architecture, grammar, mathematics, astronomy, metrics, sociology, economy and polity, ethics, geography, logic, military science, weaponry, agriculture, mining, trade and commerce, metallurgy, shipbuilding, medicine, poetics, biology, and veterinary science.

Suggested Readings:

- Textbook on IKS by Prof. B. Mahadevan, IIM Bengaluru.
- Maharaj Swami Chidatmanjee, Ancient Indian Society, Anmol Publication Pvt. Ltd., India.
- S. C. Manerjee, *Society in Ancient India: Evolution since the Vedic Times Based on Sanskrit, Pali, Prakrit and Other Classical Sources: No. 1 (Reconstructing Indian History and Culture)*, DK Printing, India.
- Rao, N. (1970). *The Four Values in Indian Philosophy and Culture*. Mysore: University of Mysore.
- Chakraborti, K. (2001). *Religious Process: The Puranas and the Making of Regional Tradition*. Delhi: OUP.
- Kuhn, T. (1970). *The Structure of Scientific Revolutions* (2nd ed.). University of Chicago Press, USA.

Useful Video Links:

Unit No	Topics	Links
Unit-I	Introduction to Indian Philosophy	https://www.youtube.com/watch?v=ddJg3gzYEb8
Unit-II	Indian Philosophy(Orthodox & Heterodox Systems)	https://www.nptelprep.in/courses/109106059/vid eos
Unit-III	Indian Knowledge Systems	https://www.youtube.com/playlist?list=PLRfu94TCePTtVPR-kC4RpIGIwo7-ViCGP
Unit-IV	Philosophy & Consciousness (Sankhya/Yoga Focus)	https://archive.nptel.ac.in/courses/109/106/109106059/

Course Code	MDC-107B				
Category	Multidisciplinary Courses				
Course Title	Indian Culture and Civilization				
Scheme and Credits	L	T	P	Credits	Semester-I
	2	0	0	2	
Course Objectives	The objectives of this course are: • To introduce the fundamentals of Ancient Indian Education to understand the pattern and purpose of studying Vedas, Vedangas, Upangas, Upaveda, Purana&Itihasa. • To help students to trace, identify, and develop the ancient knowledge systems. • To help to understand the apparently rational, verifiable, and universal solution from the ancient Indian knowledge system for the holistic development of physical, mental, and spiritual wellbeing. • To build in the learners a deep-rooted pride in Indian knowledge, committed to universal human rights, well-being, and sustainable development.				
Assessment	50 Marks				
End Semester Examination	50 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Remember core ideas and texts of Indian knowledge traditions.	Level-1 Remember
CO2	Understand philosophical and scientific foundations of knowledge systems.	Level-2 Understand
CO3	Apply traditional concepts to interpret science, language, and culture.	Level-3 Apply
CO4	Apply integrated knowledge to real-life and managerial contexts.	Level-3 Apply

Note: Examiner will set nine questions in total. Question one will have 5 short questions of 2 marks (each) from all units. Remaining eight questions of 10 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first question being compulsory and selecting one from each Unit.

Unit-I

Introduction to IKS: CaturdaśaVidyāsthānam, 64 Kalas, ShilpaŚāstra, Four Vedas, Vedāṅga, Indian Philosophical Systems, Vedic Schools of Philosophy (Sāṃkhya and Yoga, Nyaya and Vaiśeṣika, Pūrva-Mīmāṃsā and Vedānta), Non-Vedic schools of Philosophical Systems (Cārvāka, Buddhist, Jain), Puranas (Maha-puranas, Upa-Puranas and Sthala-Puranas), Itihasa (Ramayana, Mahabharata), NitiSastras, Subhasitas

Unit-II

Foundation concept for Science & Technology: Linguistics & Phonetics in Sanskrit (panini's), Computational concepts in Astadhyayi Importance of Verbs, Role of Sanskrit in Natural Language Processing, Number System and Units of Measurement, concept of zero and its importance, Large numbers & their representation, Place Value of Numerals, Decimal System, Measurements for time, distance and weight, Unique approaches to represent numbers (BhūtaSaṃkhya System, Kaṭapayādi System), Pingala and the Binary system, Knowledge Pyramid, Prameya – A Vaiśeṣikan approach to physical reality, constituents of the physical reality, Pramāṇa, Saṃśaya

Unit-III

Indian Mathematics & Astronomy in IKS: Indian Mathematics, Great Mathematicians and their contributions, Arithmetic Operations, Geometry (Sulba Sutras, Aryabhatiya-bhasya), value of Trigonometry, Algebra, Chandah Sastra of Pingala, Indian Astronomy, celestial coordinate system, Elements of the Indian Calendar Aryabhatiya and the Siddhantic Tradition Pancanga – The Indian Calendar System Astronomical Instruments (Yantras) JantarMantar or Raja Jai Singh Sawal.

Unit-IV

Indian Science & Technology in IKS: Indian S & T Heritage, sixty-four art forms and occupational skills (64 Kalas) Metals and Metalworking technology (Copper, Gold, Zinc, Mercury, Lead and Silver), Iron & Steel, Dyes and Painting Technology), Town & Planning Architecture in India, Temple Architecture, Vastu Sastra,

Humanities & Social Sciences in IKS: Health, Wellness & Psychology, Ayurveda Sleep and Food, Role of water in wellbeing Yoga way of life Indian approach to Psychology, the Triguna System Body-Mind-Intellect- Consciousness Complex. Governance, Public Administration & Management reference to Ramayana, Artha Sastra, Kautilyan State

Suggested Readings:

- Textbook on IKS by Prof. B. Mahadevan, IIM Bengaluru.
- Kapur, K. and Singh, A. K. (Eds.) (2005). *Indian Knowledge Systems*, Vol. 1. Indian Institute of Advanced Study, Shimla. *Tatvabodh* of Shankaracharya, Central Chinmaya Mission Trust, Bombay, 1995.
- Nair, Shantha N. *Echoes of Ancient Indian Wisdom*. New Delhi: Hindology Books, 2008.
- S. K. Das, *The Education System of Ancient Hindus*, Gyan Publication House, India.

Useful Video Links:

Unit No	Topics	Links
Unit-I	Introduction to Indian Knowledge Systems (Philosophy & Culture)	https://www.youtube.com/watch?v=5f0phlOdYvU
Unit-II	Ayurveda & Traditional Medicine in Indian Knowledge Systems	https://www.youtube.com/watch?v=xORzinU4oC8
Unit-III	Indian Contributions to Mathematics (Ancient Mathematics & Systems)	https://www.youtube.com/watch?v=T0gCkyKVQUg
Unit-IV	Indian Astronomy & Calendar Systems	https://www.youtube.com/watch?v=JpZBaHsQ2Ws

Course Code	MDC-109B				
Category	Multidisciplinary Courses				
Course Title	Indian Science, Engineering and Technology				
Scheme and Credits	L	T	P	Credits	Semester-I
	2	0	0	2	
Course Objectives	The objectives of this course are • To familiarize learners with major sequential development in Indian science, engineering and technology. • To review & strengthen the ancient discovery and research in physics, chemistry, maths, metallurgy, astronomy, architecture, textile, transport, agriculture and Ayurveda etc. • To help students to trace, identify and develop the ancient knowledge systems to make meaningful contribution to development of science today.				
Assessment	50 Marks				
End Semester Examination	50 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Recall key ideas, historical contributions of traditional knowledge systems.	Level-1 Remember
CO2	Understand the principles, cultural knowledge creation and practice.	Level-2 Understand
CO3	Apply traditional scientific concepts to explain natural phenomena, health, and technology.	Level-3 Apply
CO4	Apply integrated knowledge to relate traditional practices with contemporary life and sustainability.	Level-3 Apply

Note: Examiner will set nine questions in total. Question one will have 5 short questions of 2 marks (each) from all units. Remaining eight questions of 10 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first question being compulsory and selecting one from each Unit.

Unit-I

Indian Traditional Knowledge; Science and Practices: Introduction to the Science and way of doing science and research in India, Ancient Science in Intra & Inter Culture Dialogue & coevolution. Traditional agricultural practices, Traditional water-harvesting practices, Traditional Livestock and veterinary Sciences Traditional Houses & villages, Traditional Forecasting, Traditional Ayurveda & plant-based medicine, Traditional writing Technology

Unit-II

Ancient Indian Science (Physics, Chemistry, Maths): **Physics in India:** Vaisheshika Darshan atomic theory & law of motion, theory of Panchmahabhoota, BrihathShathaka (divisions of time, unit of

distance), Bhaskaracharya (theory of gravity, Surya Siddhanta&Siddhanta Shiromani), Lilavati (Gurutvakarshan Shakti).

Chemistry in India: Vatsyayana, Nagarjuna, Khanda, Al-Biruni, Vagbhaṭa – building of the Ras-shala (laboratory), working arrangements of Ras-shala, material and equipment, YaśodharaBhaṭṭa – process of distillation, apparatus, saranasamskara, saranataila..**Mathematics in India:** Baudhayana's Sulbasutras, Aryabhata, Bhaskaracharya-I, Severus Sebokht, Syria, Brahmagupta, Bhaskaracharya-II, Jyēsthadeva.

Unit-III

Ancient Indian Science (Metallurgy, Astronomy, Architecture): Metallurgy in India: Suvarna (gold) and its different types, properties; Rajata (silver); Tamra (copper); Loha (iron); Vanga (tin); Naga / Sisa (lead); Pittala (brass).

Astronomy in India: VedangaJyotish; Aryabhata Siddhanta; Mahabhaskriya; Laghubhaskriya; VatesvaraSiddhanta; Sisyaadivrdhida; Grahashraya; Goladhyaya; Karana Kutuhala (Aryabhata, Varahamihira, Brahmagupta, Vatesvara, Bhaskara, Paramesvara, NilakanthaSomayaji, Jyeshthadeva, Shankara Varman).

Architecture in India: Nagara (northern style), Vesara (mixed style), and Dravida (southern style); Indian vernacular architecture; temple style; cave architecture; rock-cut architecture; Kalinga architecture; Chandela architecture; Rajput architecture; Jain architecture; Sikh architecture; Maratha architecture; Indo-Islamic architecture; Indo-Saracenic revival architecture; Greco-Buddhist style.

Unit-IV

Ancient Indian Science (Textile, Agriculture, Transport): Textile Technology in India: Cotton (natural cellulose fiber), silk, wool (natural protein fibers), bast and leaf fibres; mridhudhautadhupaitambaram (meaning a practice of fumigating the fabric with incense smoke before use as a part of the finishing process); Sitadhautavasanaayugala (bleached white – a finishing process); suchastah, sutradharah (needle and thread – tools for stitching); dyeing, washing, spinning, and weaving technology.

Agriculture in India: Krishisuktas, Krishiparashara, Brihatsamhita; types of crops; manures; types of land – devamatruka, nadimatruka; use of animals in warfare; animal husbandry; animals for medicines.

Ancient Transport in India

Ancient Indian Science (Ayurveda & Yoga): Ayurveda for Life, Health, and Well-being: Introduction to Ayurveda; understanding the human body and PanchaMahaBhuta; the communication between body & mind; health regimen for well-being; introduction to Yoga (Raja Yoga, Ashtanga Yoga, Jnana Yoga); understanding of Indian psychological concepts; consciousness; Tridosha&Triguna.

Suggested Readings:

- Textbook on IKS by Prof. B Mahadevan, IIM Bengaluru.
- Kapur K and Singh A. K (Eds) 2005). Indian Knowledge Systems, Vol. 1. Indian Institute of Advanced Study, Shimla. Tatva Bodh of Shankaracharya, Central Chinmay mission trust, Bombay, 1995.
- Nair, Shantha N. Echoes of Ancient Indian Wisdom. New Delhi: Hindology Books, 2008.
- SK Das, The education system of Ancient Hindus, Gyan publication house, India
- Dharmapal, Indian science and technology in the eighteen century, rashtrottahanasahitya, 1983

Useful VideoLinks:

Unit No	Topics	Links
Unit-I	Indian Traditional Knowledge & Research Culture	https://archive.nptel.ac.in/courses/121/106/121106003/?
Unit-II	Ancient Indian Science (Physics, Chemistry, Maths)	https://www.youtube.com/watch?v=T0gCkyKVQUg
Unit-III	Ancient Indian Science (Metallurgy, Astronomy, Architecture)	https://www.youtube.com/watch?v=r5KTrbJlKAA

Course Code	MDC-111B				
Category	Multidisciplinary Courses				
Course Title	Indian Town Planning and Architecture				
Scheme and Credits	L	T	P	Credits	Semester-I
	2	0	0	2	
Course Objectives	The objectives of this course are • To develop the knowledge and analysis on the understanding of eco-friendly, robust and scientific planning and architecture system of ancient India. • To understand the importance of functional, aesthetic, psychological, culture and socio religious concept of ancient India architecture. • To help the learners to trace, identify and develop the approach, process and material used in town and planning, construction and architecture. • To understand the various eco-friendly technology accepted in ancient civilization				
Assessment	50 Marks				
End Semester Examination	50 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Recall the concepts related to human settlements and architectural traditions.	Level-1Remember
CO2	Understand how culture, environment, and human needs influence-built forms.	Level-2Understand
CO3	Apply principles of form, space, materials in architectural examples.	Level-3Apply
CO4	Apply analytical understanding to compare regional and period-based architectural practices.	Level-3Apply

Note: Examiner will set nine questions in total. Question one will have 5 short questions of 2 marks (each) from all units. Remaining eight questions of 10 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first question being compulsory and selecting one from each Unit.

Unit-I

The Introduction to ancient Architecture: Introduction to relationship between Man, Nature, Culture and city forms. Study of determinants (Natural and man-made) influencing location, growth & pattern of human settlements including types of settlements growth (Organic and planned) and settlement forms. Architecture as satisfying human needs: functional, aesthetic and psychological outline of components and aspects of architectural form-site, structure, skin, materials, services, use, circulation, expression, character, experience. Understanding of the causative forces - the cultures, history, socio religious practices and institution, political and economic conditions, issues of land, climate and technology, Historical and Primitive Architecture.

Unit-II

Ancient Architecture as Expression of Art & Design: Relationship between Art and Design with man, space and environment. Expression in Art and Architecture – concept of space, sense of enclosure openness, robustness, dynamism, spatial geometry, Eco-friendliness. Architecture through use of elements of visual arts such as point, line, plane, form, space, colour, texture, light, solids and voids, shadow and shade etc. Understanding of effect of scale, proportions, order, material effects such as textures, patterns, light, sound, temperature etc. in architectural spaces.

Allied visual and performing arts and its relationship to build environments using colour theory, symbolism, glass painting, scriptural writing, clay moulding, and stone carving. Important Indian architecture as per elements space & form: specific geometry form (sphere, cube, pyramid, cylinder and cone and its sections as well as their derivatives) Space: build form space, open space, Internal and External space, Continuous spaces Centralized, Linear, Radial Clustered, Grid space Different type of Materials used for construction in Ancient Indian architecture. Clay products: Classification of bricks, Fire Brick, Fly Ash Bricks, Tiles, Terracotta, Earthenware, Porcelain, Stoneware. Stones: Uses of Stones, Qualities of Good Building Stones, Dressing, Common Building Stones of India. Glass: Different glass Forms and their Suitability, Timber: Different Forms and their Suitability Metals: Ferrous & Nonferrous Metals and Alloys, and, their Suitability, limitations, precautions Paints and Varnishes: Different types and their Suitability, limitations, precautions

Unit-III

Ancient Architecture Principle & Planning: Design: Principles of designing – Composition of Plan. Inception and development of the early Hindu temple form with reference to Vedic and

Buddhist planning principles and design elements; Development of regional styles and manifestations thereof; Evolution of temple complexes and temple towns; planning: Residence- site selection, site orientation- aspect, prospect, grouping, circulation, privacy, furniture requirements, services and other factors. Vastushastra and its importance in building interrelationship with human, nature and cosmos Town Planning: Town plans of Harappa, Mohenjo-Daro, Pataliputra, and Delhi. Vastushastra and its application in city layout.

Unit-IV

Ancient Architecture-I: The settlement planning pattern, elements, associated forms, typical Vedic village, towns (Dandaka, Nandyavarttha etc.), typology of Shelters and civic buildings of ancient architecture in reference to following civilization: Indus Valley, Aryan/Vedic Civilisation, Buddhist Architecture, Indo Aryan & Dravidian Architecture. Role of Shilpasastras and Arthashastra in settlement planning. Important architecture: Great baths, Development of fortification, walled towns, structures developed e.g.: Stupas, Viharas, Chaityas, Stambhas, Torana, sacredrailingetc. Study of worshipping places with especial reference to Indo Aryan / Nagarastyle & Dravidian style (Chola, Chalukya, Pallava, Satavahana, Hoysala, Vijayanagar etc.), design of shikharas&gopuram, rock-cut and structural examples of temples.

Ancient Architecture-II: Evolution of Hindu Temples in different period: Gupta, Aihole, Badami, Pattadakal, Mahabalipuram, Indo Aryan Style in Orrisa, Khajuraho, Gujarat, Rajasthan. Dravidian Style in Chola, Chalukyan, Pandya, Pallava, Hoysala Style, Revival of Hindu architecture of South India at Vijayanagara and Madurai Tradition Indian villages & House: Regional house construction, interior & importance e.g. Rajasthani house, bhungas of Kutch, nalukettu of Kerala, Ikraofassam, manduvalogili or illu of Andhra Pradesh, Wadas of Maharashtra, Mudhouses of Madhya Pradesh, kathkuni of Himachal Pradesh, khanjagharaoforisha, Taq and dhajjidiwari of Kashmir etc. Scientific achievements though ancient architect: JantarMantar, Musical Pillars of Vitthal temple, Sundial of Konark temple, construction of eight

shivatemple in straight line from Kedarnath to Rameshwaram at longitude 79°E 41'54", Veerbhadra temple with 70 hanging pillars, Ellora caves excavating the mountain, Jaipur plan pink city etc.

Suggested Readings:

- Textbook on IKS by Prof. B Mahadevan, IIM Bengaluru.
- Kapur K and Singh A. K (Eds) 2005). Indian Knowledge Systems, Vol. 1. Indian Institute of Advanced Study, Shimla. Tatva Bodh of Shankaracharya, Central Chinmay mission trust, Bombay, 1995.
- Nair, Shantha N. Echoes of Ancient Indian Wisdom. New Delhi: Hindology Books, 2008.
- Dr. V. Ganapati Sthapati, Building Architecture of Sthapatya Veda
- BinodeBehariDutt, Town planning in ancient India, Life Span Publishers & Distributors
- NR Dave, A Study of The Hindu Science of Architecture and its Practice with Special Reference to Raja Vallabha, Bharti Vaidya Bhavan, 2011
- M W Meister, South India Lower DravidaDesa - Encyclopaedia of Indian Temple Architecture (Set of 2 Books)- An Old and Rare Books, American Institute of Indian Studies, 1999
- D N Shukla Civil Architecture in Ancient India (Part-I) Meharchand Lakshmi Das publication, 2016.

Useful Video Links:

Unit No	Topics	Links
Unit-I	Early Architecture & Human Settlements	https://www.youtube.com/watch?v=zq8t_XnJhTQ
Unit-II	Buddhist, Early Temple & Built Forms	https://www.youtube.com/watch?v=zq8t_XnJhTQ
Unit-III	Temple Evolution & Material/Spatial Concepts	https://www.youtube.com/watch?v=7Bx9UYSIIDk
Unit-IV	Historical Examples & Site Planning	https://www.nptelprep.in/courses/124106009/videos?

Course Code	MDC-113B				
Category	Multidisciplinary Courses				
Course Title	Indian Health, Wellness and Psychology				
Scheme and Credits	L	T	P	Credits	Semester-I
	2	0	0	2	
Course Objectives	The objectives of this course are • To Understand the fundamental principles of Indian health systems such as Ayurveda and yoga which are useful in maintaining the health of a healthy person • Understand traditional way of cleansing the body regularly, strengthening body with Yogic exercises, maintaining the internal balance to prevent diseases • To understand our unique Mind Body Constitution and choosing the right lifestyle suitable to maintain the internal balance. • Understanding mind and its dynamics through knowledge of Ayurveda and Yoga and using the knowledge to maintain harmony between body and mind to achieve perfect mental health.				
Assessment	50 Marks				
End Semester Examination	50 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Recall fundamental concepts related to human constitution, health maintenance, and mind-body interrelationships.	Level-1 Remember
CO2	Explain how internal balance, lifestyle practices, and mental factors influence overall wellbeing and immunity.	Level-2 Understand
CO3	Apply principles of daily and seasonal routines, diet, and self-care practices to promote physical and mental health	Level-3 Apply
CO4	Apply integrative mind-body principles to enhance resilience, self-awareness, and holistic health in everyday life.	Level-3 Apply

Note: Examiner will set nine questions in total. Question one will have 5 short questions of 2 marks (each) from all units. Remaining eight questions of 10 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first question being compulsory and selecting one from each Unit.

Unit-I

Understanding human body: Introduction to Ayurveda, the Knowledge of Life, Health and treatment aspects in Ayurveda, Influence of PanchamahaBhuta on Internal environment of Human being, understanding composition of Human body through the concept of DoshaDhatu Mala, Understanding Prakruthi, the Mind – Body Constitution.

Unit-II

Understanding the communication between body & Mind: Establishing communication between body and mind by understanding the language of body. Understanding the concept of Agni, Koshta, Sara and Ojas and their relevance in enhancing our immunity to protect from various infections. Looking at the world through the lenses of Dravya, Guna and Karma Applying the principle of Samanya and Vishesha in every aspect of life to achieve perfect health.

Unit-III

Introduction to Health Regimen: Understanding Swasthavritta, the healthy regimen to maintain state of wellbeing Dinacharya, the Daily regimen including Daily detoxification, exercise, Intake of Food, Water, Air and Sunlight, work and ergonomics, Rest and sleep hygiene. Ritucharya, the seasonal regimen, Sadvritta and the concept of social wellbeing, understanding trividhaupastambhas, three pillars to health, Concept of Shadrasa in choosing appropriate nourishment to the body and mind.

Unit-IV

Introduction to Yoga: Definition, Meaning and objectives of Yoga, Relevance of yoga in modern age. Brief Introduction of Hatha yoga, Raja yoga, Karma yoga, Gyana Yoga, Bhaktiyoga Understanding eight steps of Ashtanga yoga, Understanding Shatkriyas, the six cleansing procedures of Yoga

Introduction to Indian Psychology: Concept of Manas in Ayurveda and understanding Mind Body harmony, Triguna based Psychology in Ayurveda and Yoga, Influence of Tri dosha on Mind, Mind body intellect and consciousness complex, Understanding Consciousness and solution to issues within Human Mind.

Suggested Readings:

- Dr Deepak Chopra, Perfect Health--Revised and Updated: The Complete Mind Body Guide, Harmony publication, 2001
- Vasant lad, Ayurveda, the Science of Self-healing: A Practical Guide: Science of Self- healing, lotus press, 1984
- BKS Iyengar, Light on Yoga: The Classic Guide to Yoga by the World's Foremost Authority, thronson publication, 2006
- SwamySatyanandaSaraswati, Asana, Pranayama, Mudra and Bandha, Bihar School of Yoga, 2002

Useful Video Links:

Unit No	Topics	Links
Unit-I	Introductory Concepts & Roots of the Tradition	https://www.youtube.com/watch?reload=9&v=16-q-V9IG5w&embeds_referring_euri=https%3A%2F%2F
Unit-II	Human Body, Constitution & Balance	https://www.youtube.com/watch?v=ty9ZfluxOFk&embeds_referring_euri
Unit-III	Healthy Living & Well-Being (Daily/Seasonal Regimen)	https://www.youtube.com/watch?v=9AJseqmcrfQ

Scheme of Studies and Examination

BCA – 2nd Semester

w.e.f 2025-26

Sr. No.	Category	Course Code	Course Title	Hours per week			Total Load Per Week	Credits	Examination Schedule (Marks)			
				L	T	P			Assessment	End Semester Exam	Practical	Total
1	Core Courses	DSC-BCA-102B	Mathematics Foundations to Computer Science-II	3	0	0	3	3	25	50		75
2	Core Courses	DSC-BCA-104B	Data Structures	3	0	0	3	3	25	50	-	75
		LC-BCA-106B	Data Structures Lab	0	0	2	2	1	10	-	15	25
3	Core Courses	DSC-BCA-108B	Computer Architecture	3	0	0	3	3	25	50		75
4	Core Courses	DSC-BCA-110B	Operating Systems	3	0	0	3	3	25	50		75
		LC-BCA-112B	Operating Systems Lab	0	0	2	2	1	10	-	15	25
5	Skill Enhancement Courses	SEC-BCA-114B	Object Oriented Programming using Java	3	0	0	3	3	25	50	-	75
		LC-BCA-116B	Object Oriented Programming using Java Lab	0	0	4	4	2	15	-	35	50
6	Value Added Courses	VAC-102B	Indian Constitution	2	0	0	2	2	65	35		100
7	Ability Enhancement Courses	AEC-106B(Hindi)	Additional Course - Indian or Foreign Language Other than Mother Tongue and English (1- 1-0)) [optional course]*	1	1	0	0*	-	-	-	-	-
Total Credits								21	225	285	65	575

Note:

1. The duration of all the end-term theory examinations shall be 3 hours.
2. The Criteria for awarding the formative assessment for Core Courses and Skill Enhancement Courses for 2nd semester shall be as under:

a) Sessional Examination: 50 %

b) Assignments/ Presentations/ Seminars and Class Participation: 30%

c) Attendance: 20%

(Less than 65% - 0 marks; Up to 70% - 2 marks; up to 75% - 3 marks; up to 80% - 4 marks; above 80% - 5 marks)

3. The panel of examiners for end-semester theory examinations shall be prepared and approved by the BOS, comprising internal and external examiners based on their expertise, specialization, and area of interest.

4. The formative assessment criteria for **Ability-Enhancement Course** in Semester II will be as follows:

Sessional Test	30 Marks
Peer Discussion/ Debate/ Extempore Speech	10 Marks
Role Play	05 Marks
Assignment/Essay/ Article/ Report Writing	15 Marks
Attendance (Criteria as mentioned above in 2(c))	05 Marks

5. The formative assessment criteria for **Value Added Course** in Semester II will be as follows:

Sessional Test	30 Marks
Class Assignment/ Case Study/ Mini Project	15 Marks
Quiz/ Seminar/ Group Discussion/ Debate	15 Marks
Attendance (Criteria as mentioned above in 2(c))	05 Marks

6. An '**Additional Course**' is a non-credit course that is undertaken for learning purposes only. If completed, the '**Additional Course**' may be recorded and will be assessed on a **Grading** basis.

Marks (%)	Letter Grade	Grade Point
>90	O(Outstanding)	10
>75 to 90	A+(Excellent)	9
> 65 to 75	A(Very good)	8
>55 to 65	B+(Good)	7
> 50 to 55	B(Above average)	6
> 40 to 50	C(Average)	5
40	P (Pass)	4
Less than 40	F(Fail)	0
-	Ab(Absent)	0

After Year 1, Students are advised to take Social Responsibility & Community Engagement - encompassing Community Engagement with an NGO in the vacation time.

An UNDER GRADUATE CERTIFICATE IN COMPUTER APPLICATION will be awarded, if a student wishes to exit at the end of First year.

Exit Criteria after First Year of BCA Programme

Students will have the option to exit the Bachelor of Computer Application (BCA) program after successfully completing the first year. Upon exit, they will be awarded a **UG Certificate in Computer Application**. To be eligible for this certificate, students must complete **an additional 04 credits** in one of the following are as:

1. **Skill-Based Subject:** A course designed to enhance practical and technical skills in the field of computer applications.
2. **Work-Based Vocational Course:** A vocational course offered during the summer term that emphasizes hands-on training and workplace readiness.
3. **Internship/Apprenticeship:** A professional internship or apprenticeship program in a relevant field, with a minimum duration of 08 weeks, which will take place after the second semester.
4. **Social Responsibility & Community Engagement:** Active engagement with an NGO or community organization for a minimum duration of 08 weeks, focusing on real-world problem-solving, social responsibility, and community service.

The mode and specifics of these additional credits will be determined by the respective **University/ Admitting Body**, and students will be required to complete the 08-week program during the summer term following their second semester.

The exiting students will clear the subject / submit the Internship Report as per the University schedule.

Re-entry Criteria in to Second Year (Third Semester)

The student who takes an exit after one year with an award of certificate may be allowed to re-enter in to Third Semester for completion of the BCA Program as per the respective University /Admitting Body schedule after earning requisite credits in the First year.

Students can choose their specialization i.e. Stream with Discipline Specific Elective [DSE] from Second year onwards.

Course Code	DSC-BCA-102B				
Category	Core Courses				
Course Title	Mathematics Foundation to Computer Science-II				
Scheme and Credits	L	T	P	Credits	Semester-II
	3	0	0	3	
Course Objectives	The objectives of this course are to • Provide mathematical foundations including algebraic structures, numerical methods, and optimization for solving computational problems. • Enhance problem-solving abilities to address theoretical and practical challenges in computer science applications.				
Assessment	25 Marks				
End Semester Examination	50 Marks				
Total	75 Marks				
Duration of Exam	3Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Describe fundamental concepts, formulae, and standard methods related to logical operations, algebraic structures, numerical methods, and optimization techniques	Level-2 Understand
CO2	Apply the logical operations, various techniques, forms and methods of proof to solve the associated problems.	Level-3 Apply
CO3	Solve the problems by using techniques of numerical methods and algebraic structures.	Level-3 Apply
CO4	Use optimization techniques to solve the problems related to linear programming and transportation.	Level-3 Apply

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 5 parts of 2 marks each from all units and remaining 8 questions of 10 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

UNIT I

Logic and Methods of Proofs: Propositions, logical operations (basic connectives), compound statements, construction of truth table, quantifiers, conditional statements, tautology, contradiction, contingency, logical equivalence. Conjunctive Normal Forms (CNF) and Disjunctive Normal Forms (DNF). Methods of proofs: Rules of inference for propositional logic, modus ponens, modus tollens, syllogism, proof by contradiction, Mathematical Induction.

UNIT II

Algebraic Structures: Semi-group, Monoid, Group, Subgroup, Cyclic group.

UNIT III

Numerical Methods: Concept and importance of errors in numerical methods. Solution of algebraic and transcendental equations: Bisection method and Newton-Raphson methods.

Numerical Interpolation: Newton's Forward and Newton's backward interpolation formula and Lagrange's formula.

Numerical Integration: Trapezoidal rule and Simpson's 1/3 rule only formula and problem solving for all the topics mentioned above.

UNIT IV

Optimization Techniques: Linear programming: Introduction, LP formulation, Graphical method for solving LPs with two variables, Special cases in graphical methods, Simplex method, Duality.

Transportation problem: Definition, Linear form, North-west corner method, Least cost method, Vogel's approximation method for finding feasible solution, MODI method for finding optimum solution.

Suggested Readings:

- Kolman B., Busby R. and Ross S., Discrete Mathematical Structures, 6th Edition, Pearson Education, 2015.
- Sastry S.S., Introductory Methods of Numerical Analysis, Fifth Edition, PHL, 2022.
- TahaHamdy A., Operations Research: An Introduction, Eighth Edition, Pearson Prentice Hall, 2003.
- S.B. Singh, Discrete Structures, Khanna Book Publishing, 2023 (AICTE Recommended Textbook)
- Rosen Kenneth H. and Krithivasan Kamala, Discrete Mathematics and its Applications, McGraw Hill, India, 2019.
- Chakravorty J.G. and Ghosh P.R., Linear Programming and Game Theory, Moulik Library, 2017.
- Sharma J.K., Operations Research: Theory and Applications, Fourth Edition, Macmillan Publishers, 2007.

Useful Video Links:

Unit No.	Topics	Links
UNIT-1	Propositions, logical operations (basic connectives), compound statements	https://www.youtube.com/watch?v=r8G6dxvBDMg
	tautology, contradiction, contingency,	https://www.youtube.com/watch?v=FPXjypbgFUA
	Conjunctive Normal Forms (CNF) and Disjunctive Normal Forms (DNF)	https://www.youtube.com/watch?v=w2DlMu8ZzHE
	Methods of proofs: Rules of inference for propositional logic, modus ponens, modus tollens	https://www.youtube.com/watch?v=0_URFaZQXUU
	Mathematical Induction.	https://www.youtube.com/watch?v=7WUPTe39fMg
UNIT-1I	Semi-group, Monoid, Group	https://www.youtube.com/watch?v=ihQyZ7bJcRE
	Subgroup, Cyclic group.	https://www.youtube.com/watch?v=wx676fYedZ0
UNIT-1II	Newton's Forward and Newton's Backward interpolation formula	https://youtu.be/Aw6LvaPtESE?si=uMd0moKsGOB4ocTu
	Lagrange's formula.	https://youtu.be/W89qBdRI8e4?si=y-zOk1zmJGppPWZp
	Trapezoidal rule and Simpson's 1/3 rule.	https://youtu.be/EA76ONWBgK4?si=SpIE1WNaO8e0gpnP
UNIT-1V	Graphical method for solving LPs with two variables, Simplex method, Duality	https://youtu.be/2EvC1v1FI2k?si=8d1deI63m8vJeB_M
	Linear form, method for finding feasible solution, MODI method for finding optimum solution.	https://youtu.be/Ow3XWYnPgSM?si=E01KqUcTKzr6w1fy
		https://youtu.be/NqXFWCHibII?si=z-qfuKLGvg1AUXBi

Course Code	DSC-BCA-104B				
Category	Core Courses				
Course Title	Data Structures				
Scheme and Credits	L	T	P	Credits	Semester-II
	3	0	0	3	
Course Objectives	- Understand the fundamental concepts of Data Structures and their applications. - Develop problem-solving skills using Data Structures. - Implement Data Structures using C programming language.				
Assessment	25Marks				
End Semester Examination	50 Marks				
Total	75 Marks				
Duration of Exam	3Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Recall basic concepts of data structures, algorithms, arrays, searching, and sorting techniques.	Level-1 Remember
CO2	Explain linked lists, hashing techniques, and their operations.	Level-2 Understand
CO3	Apply stacks, queues, and recursion to solve computational problems.	Level-3 Apply
CO4	Analyze tree and graph structures and perform related operations such as traversal, insertion, deletion, and balancing.	Level-4 Analyze

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 5 parts of 2 marks each from all units and remaining 8 questions of 10 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

UNIT I

Introduction and Overview: Definition, Classification and Operations of Data Structures. Algorithms: Complexity, Time-Space Tradeoff.

Arrays: Definition and Classification of Arrays, Representation of Linear Arrays in Memory, Operations on Linear Arrays: Traversing, Inserting, Deleting, Searching, Sorting and Merging. Searching: Linear Search and Binary Search, Comparison of Methods. Sorting: Bubble Sort, Selection Sort, and Insertion Sort. Two- Dimensional Arrays, Representation of Two Dimensional Arrays in Memory, Matrices and Sparse Matrices, Multi-Dimensional Arrays.

UNIT II

Linked Lists: Definition, Comparison with Arrays, Representation, Types of Linked lists, Traversing, Inserting, Deleting and Searching in Singly Linked List, Doubly Linked List and Circular Linked List .Applications of Linked Lists: Addition of Polynomials.

Hashing and Collision: Hashing, Hash Tables, Types of Hash Functions, Collision, and Collision Resolution with Open Addressing and Chaining.

UNIT III

Stacks: Definition, Representation of Stacks using Arrays and Linked List, Operations on Stacks using Arrays and Linked List, Application of Stacks: Arithmetic Expressions, Polish Notation, Conversion of Infix Expression to Post fix Expression, Evaluation of Postfix Expression.

Recursion: Definition, Recursive Notation, and Runtime Stack, Applications of Recursion: Factorial of Number, GCD, Fibonacci Series and Towers of Hanoi.

Queues: Definition, Representation of Queues using Array and Linked List, Types of Queue: Simple Queue, Circular Queue, Double-Ended queue, Priority Queue, Operations on Simple Queues and Circular Queues using Array and Linked List, Applications of Queues.

UNIT IV

Graphs: Definition, Terminology, Representation, Traversal.

Trees: Definition, Terminology, Binary Trees, Traversal of Binary Tree, Binary Search Tree, Inserting, Deleting and Searching in Binary Search Tree, Height Balanced Trees: AVL Trees, Insertion and Deletion in AVL Tree.

Suggested Readings:

1. R.B. Patel, "Expert Data Structures with C", Khanna Book Publishing Company, 2023 (AICTE Recommended Textbook)
2. Seymour Lipschutz, "Data Structures with C", Schaum's Outlines, Tata McGraw-Hill, 2011.
3. Yashavant Kanetkar, "Data Structures Through C", 4th Edition, BPB Publications, 2022.
4. Reema Thareja, "Data Structures Using C", Second Edition, Oxford University Press, 2014.
5. Ellis Horowitz, Sartaj Sahni and Susan Anderson-Freed, "Fundamentals of Data Structures in C", Second Edition, Universities Press, 2007.

Useful Video Links:

Unit No.	Topics	Links
Unit-I	Arrays	https://youtu.be/INP2KnKZ5Tc?si=6givm9e8nsbc7yt8
Unit-II	Linked Lists	https://youtu.be/sjVFxIJ92P0?si=F-qmIA-Asl4gT0t1
Unit-III	Stacks	https://youtu.be/zv0hUsIsHms?si=UpWYyyVMZG8O89nu
Unit-IV	Graphs	https://youtu.be/pcXxSM7caDI?si=U_Fk1RLSk_j-i_3r

Course Code	LC-BCA-106B				
Category	Core Courses				
Course Title	Data Structure Lab				
Scheme and Credits	L	T	P	Credits	Semester-II
	0	0	2	1	
Course Objectives	The objectives of this course are to • To understand the basic concepts of data structures and their significance in problem solving. • To develop programs for performing operations on arrays including insertion, deletion, searching, sorting, merging, and matrix operations. • To implement and perform operations on linear data structures such as Singly Linked List, Doubly Linked List, and Circular Linked List				
Assessment	10 Marks				
End Semester Examination	15 Marks				
Total	25 Marks				
Duration of Exam	3Hours				

Course Outcomes: After successful completion of this course, the students will be able to

Cos	Skills Demonstrated	RBT Level
CO1	Apply programming concepts to implement array operations, searching, sorting, and matrix operations.	Level-3 Apply
CO2	Analyze and implement linked list operations including singly, doubly, and circular linked lists.	Level-4 Analyze
CO3	Evaluate stack and queue implementations using arrays and linked lists for solving problems like postfix evaluation and polynomial addition.	Level-5 Evaluate
CO4	Create solutions using recursion and advanced data structures such as circular queues and binary search trees.	Level-6 Create

Exp. No.	Contents
1.	Write a program for insertion and deletion operations in an array.
2.	Write a program to search for an element in an array using Linear Search and Binary Search.
3.	Write a program to sort an array using Bubble Sort, Selection Sort and Insertion Sort.
4.	Write a program to merge two arrays.
5.	Write a program to add and subtract two matrices.
6.	Write a program to multiply two matrices.
7.	Write a program to insert an element into a Singly Linked List: a. At the beginning b. At the end c. At a specified position
8.	Write a program to delete an element from a Singly Linked List: a. At the beginning b. At the end c. A specified element
9.	Write a program to perform the following operations in a Doubly Linked List: a. Create b. Search for an element
10.	Write a program to perform the following operations in a Circular Linked List: a. Create b. Search for an element
11.	Write a program to implement stack operations using an array.

12.	Write a program to implement stack operations using a linked list.
13	Write a program to add two polynomials using a linked lists.
14	Write a program to evaluate a post fix expression using a stack.
15	Write a program to perform the following using recursion: a. Find the factorial of a number. b. Find the GCD of two numbers. c. Solve Towers of Hanoi problem.
16	Write a program to implements queue operations using an array.
17	Write a program to implement circular queue operations using an array.
18	Write a program to implement circular queue operations using a linked list.
19	Write a program to perform insertion operation in a binary search tree.

Course Code	DSC-BCA-108B				
Category	Core Courses				
Course Title	Computer Architecture				
Scheme and Credits	L	T	P	Credits	Semester-II
	3	0	0	3	
Course Objectives	The objectives of this course are to • To develop understanding of digital systems, Boolean algebra, K-Maps, and number systems. • To develop ability to explain combinational and sequential circuits, registers, and counters. • To develop skills to apply CPU organization, instruction formats, and RISC/CISC concepts.				
Assessment	25 Marks				
End Semester Examination	50 Marks				
Total	75 Marks				
Duration of Exam	3Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Recall digital signals, number systems, Boolean laws, K-Maps, and coding schemes.	Level-1 Remember
CO2	Explain combinational and sequential circuits, registers, and counters.	Level-2 Understand
CO3	Apply computer organization concepts, CPU operations, and RISC/CISC architectures.	Level-3 Apply
CO4	Analyze pipelining, I/O, and memory hierarchy for performance optimization.	Level-4 Analyze

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 5 parts of 2 marks each from all units and remaining 8 questions of 10 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

UNIT-I

Digital Principles: Definition for Digital signals, Digital logic, Digital computers, Von Neumann Architecture, Boolean Laws and Theorems, K-Map: Truth Tables to K-Map, 2, 3 and 4 variable K Map, K-Map Simplifications, Don't Care Conditions, SOP and POS. Number Systems: Decimal, Binary, Octal, Hexadecimal, Number System Conversions, Binary Arithmetic, Addition and subtraction of BCD, Octal Arithmetic, Hexadecimal Arithmetic, Binary Codes, Decimal Codes, Error detecting and correcting Codes, ASCII, EBCDIC, Excess3 Code, the Gray Code.

UNIT-II

Combinational Circuits: Half Adder and Full Adder, Subtractor, Decoders, Encoder, Multiplexer, DE multiplexer Sequential Circuits: Flip-Flops- SR Flip- Flop, D Flip-Flop, J-K Flip-Flop, T Flip-Flop.

Register: 4 bit register with parallel load, Shift Registers- Bidirectional shift register with parallel load Binary Counters-4 bit synchronous and Asynchronous binary counter.

UNIT-III

Basic Computer Organization and Design: Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instructions, Input Output Interrupt, Complete Computer Description, Design of Basic Computer, Design of Accumulator logic.

Central Processing Unit: Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, Reduced Instruction Set Computer(RISC), RISC Vs CISC.

UNIT-IV

Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline. Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous Data transfer, Modes of Transfer, Priority Interrupt, Direct memory Access, Input-Output Processor (IOP). Memory Organization: Memory Hierarchy, Main Memory, Auxiliary memory, Associate Memory, Cache Memory, Virtual Memory, Memory Management Hardware.

Suggested Readings:

1. William Stallings- “Computer Organization and Architecture”, Pearson/PHI, Sixth Edition,
2. Andrew S. Tanenbaum- “Structured Computer Organization”, PHI /Pearson 4th Edition,
3. M.V .Subramanyam, “Switching Theory and Logic Design”, Laxmi Publications (P) Ltd.
4. Ikvinderpal Singh, Computer Organization Architecture, Khanna Book Publishing.

Useful Video Links:

Unit No.	Topics	Links
Unit-I	Digital Principles	https://youtu.be/fwTRzApMCgs?si=wlxoAeEzcruVNhgW
Unit-II	Combinational Circuits	https://youtu.be/EK3Q3donQeQ?si=uC97pRJPA2Feozyo
Unit-III	Basic Computer Organization and Design	https://youtu.be/d5Xqhc5ho-w?si=GaPGn72aA6GPBZMO
Unit-IV	Pipeline and Vector Processing	https://youtu.be/S-mGaA-ZopM?si=intk2XLqeb-OBHcu

Course Code	DSC-BCA-110B				
Category	Core Courses				
Course Title	Operating Systems				
Scheme and Credits	L	T	P	Credits	Semester-II
	3	0	0	3	
Course Objectives	The objectives of this course are to • To develop understanding of operating system concepts, structures, types, components, and services. • To develop ability to explain process management, multithreading, and CPU scheduling algorithms. • To develop skills to apply process synchronization techniques and handle deadlocks effectively.				
Assessment	25 Marks				
End Semester Examination	50 Marks				
Total	75 Marks				
Duration of Exam	3Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Recall the basic concepts, components, services, types, and structures of operating systems.	Level-1 Remember
CO2	Explain process concepts, states, threads, and CPU scheduling algorithms including their benefits and performance evaluation.	Level-2 Understand
CO3	Apply process synchronization mechanisms and deadlock handling techniques to solve inter-process communication and critical section problems.	Level-3 Apply
CO4	Analyze memory management techniques, virtual memory, and paging, segmentation, and I/O management including disk scheduling for efficient system performance.	Level-4 Analyze

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 5 parts of 2 marks each from all units and remaining 8 questions of 10 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

UNIT I:

Operating Systems Overview: Definition, Evaluation of O.S, Components & Services of OS, Structure, Architecture, types of Operating Systems, Batch Systems, Concepts of Multiprogramming and Time Sharing, Parallel, Distributed and real time Systems.

Operating Systems Structures: Operating system services and systems calls, system programs, operating system structure, operating systems generations.

UNIT II

Process Management: Process Definition, Process states, Process State transitions, Process Scheduling, Process Control Block, Threads, Concept of multithreads, Benefits of threads, Types of threads.

Process Scheduling: Definition, Scheduling objectives, Scheduling algorithms, CPU scheduling Preemptive and Non-preemptive Scheduling algorithms (FCFS, SJF and RR), Performance evaluation of the scheduling Algorithms

UNIT III

Process Synchronization: Introduction, Inter-process Communication, Race Conditions, Critical Section Problem, Mutual Exclusion, Semaphores, Monitors.

Deadlocks: System model, deadlock characterization, deadlock prevention, avoidance, Banker's algorithm, Deadlock detection, and recovery from deadlocks.

UNIT IV

Memory Management: Logical and Physical address map, Swapping, Memory allocation, MFT, MVT, Internal and External fragmentation and Compaction, Paging, Segmentation.

Virtual Memory: Demand paging, Page Replacement algorithms, Allocation of frames, thrashing.

I/O Management: Principles of I/O Hardware: Disk structure, Disk scheduling algorithms.

Suggested Readings:

1. EktaWalia, Operating Systems Concepts , Khanna Publishing House,2022(AICTE Recommended Textbook)
2. Abraham Silberschatz ,Peter Baer Galvin,Greg Gagne (2006),Operating System Principles, 7th edition OR Later edition, Wiley India Private Limited, New Delhi.
3. Stallings (2006), Operating Systems, Internal sand Design Principles, 5th edition, Pearson Education, India.
4. Andrew S Tanenbaum, Modern Operating Systems, Third Edition, Prentice Hall India.
5. SumitabhaDas,UNIX Concepts and Applications, 4th Edition, Tata McGraw-Hill.

Useful Video Links:

Unit No.	Topics	Links
Unit-I	Operating Systems	https://youtu.be/a2B69vCtjOU?si=nyg_rs8mUCNq2PHD
Unit-II	Process Management	https://youtu.be/g_kLI2pkNC4?si=UsQ20Ekuya_6F2vI
Unit-III	Process Synchronization	https://youtu.be/JOaBNuXgqqw?si=Zd9q7pAF-tr2q4mZ
Unit-IV	Memory Management	https://youtu.be/_pKbqFyG03s?si=V7buPm3hRq-j34KE

Course Code	LC-BCA-112B				
Category	Core Courses				
Course Title	Operating System Lab				
Scheme and Credits	L	T	P	Credits	Semester-II
	0	0	2	1	
Course Objectives	The objectives of this course are to • To develop understanding of CPU scheduling algorithms. • To develop ability to implement deadlock handling techniques. • To develop skills in process synchronization and inter-process communication.				
Assessment	10 Marks				
End Semester Examination	15 Marks				
Total	25 Marks				
Duration of Exam	3Hours				

Course Outcomes: After successful completion of this course, the students will be able to

Cos	Skills Demonstrated	RBT Level
CO1	Apply C programming to implement CPU scheduling algorithms such as FCFS, SJF, and Round Robin.	Level-3 Apply
CO2	Analyze process synchronization and deadlock handling using problems like Producer–Consumer, Dining Philosophers, and Banker’s Algorithm.	Level-4 Analyze
CO3	Evaluate memory management techniques including paging, segmentation, and contiguous allocation methods (First Fit, Best Fit).	Level-5 Evaluate
CO4	Create solutions for operating system concepts such as IPC using pipes, page replacement (FIFO), and file allocation methods.	Level-6 Create

Exp. No.	Contents
1	Write C program to simulate the FCFS CPU Scheduling algorithm.
2	Write C program to simulate the SJF CPU Scheduling algorithm
3	Write C program to simulate the Round Robin CPU Scheduling algorithm.
4	Write a C program to simulate Bankers Algorithm for Deadlock Avoidance.
5	Write a C program to implement the Producer–Consumer problem using semaphores.
6	Write a C program to illustrate the IPC mechanism using Pipes.
7	Write a C program to simulate Paging memory management technique
8	Write a C program to simulate Segmentation memory management technique.
9	Write a C program to simulate the Best Fit contiguous memory allocation technique.
10	Write a C program to simulate the First Fit contiguous memory allocation technique.
11	Write a C program to simulate the concept of Dining-Philosophers problem.
12	Write a C program to implement FIFO page replacement technique
13	Write a C program that demonstrates the implementation of the sequential file allocation method

Course Code	SEC-BCA-114B				
Category	Skill Enhancement Courses				
Course Title	Object Oriented Programming using Java				
Scheme and Credits	L	T	P	Credits	Semester-II
	3	0	0	3	
Course Objectives	The objectives of this course are to • To introduce the object oriented programming system concepts • To introduce syntax and semantics of Java programming language • To develop modular programs using Java • To setup JDK environment to create, debug and run Java programs				
Assessment	25 Marks				
End Semester Examination	50 Marks				
Total	75 Marks				
Duration of Exam	3Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Recall the basic concepts, benefits, applications of OOP, and features of Java, including Java program structure and environment.	Level-1 Remember
CO2	Explain Java data types, variables, operators, expressions, control statements, and looping mechanisms.	Level-2 Understand
CO3	Apply object-oriented concepts to design classes, methods, inheritance, polymorphism, and handle arrays, strings, and vectors in Java programs.	Level-3 Apply
CO4	Analyze and implement Java packages and exception handling mechanisms to create modular and robust programs.	Level-4 Analyze

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 5 parts of 2 marks each from all units and remaining 8 questions of 10 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

UNIT I

Fundamentals of Object Oriented Programming: Basic Concepts of Object Oriented Programming (OOP), Benefits and Applications of OOP.

Java Evolution: Java Features, Difference between Java, C and C++, Java and Internet, Java Environment.

Overview of Java Language: Introduction to Simple Java Program, Use of Comments and Math function, Application of two classes, Java Program Structure, Java Tokens and statements, Implementing Java program And JVM, Command Line Arguments.

UNIT II

Constants, Variables and Data Types: Constants, Variables, Data Types, Declaration of Variables, Giving values to Variables, Symbolic Constants, Type casting.

Operators & Expressions: Arithmetic operators, Relational operators, Logical operators, Assignment operators, Increment & Decrement operators, conditional operators, Bitwise operators, Arithmetic Expressions, Evaluation of Expressions, Type Conversions in Expressions, Operator Precedence & Associativity.

Decision Making, Branching & Looping: Decision Making with Control Statements, Looping statements, Jump in loops, Labelled loops.

UNIT III

Classes, Objects and Methods: Defining Class, Methods Declaration, Constructors, Methods Overloading, Overriding Methods, Inheritance

Arrays, Strings and Vectors: 1D arrays, Creating an Array, 2D arrays, Strings, Vectors, Wrapper Classes, Enumerated Types

Inheritance: Defining, extending classes, and Implementing Interfaces. Multiple inheritance and polymorphism.

UNIT IV

Packages: Basics of packages, System packages, Creating and accessing packages, creating user defined packages, Adding class to a package.

Exception Handling: Using the main keywords of exception handling: try, catch, throw, throws and finally; Nested try, multiple catch statements, creating user defined exception

Suggested Readings:

1. Balaguruswamy E. (2023). Programming with JAVA: A Primer. 7th edition. India: McGraw Hill Education
2. Schildt, H. (2022). Java: The Complete Reference. 12th edition. McGraw- Hill Education.
3. AruneshGoyal, The Essentials of JAVA, Khanna Book Publishing Company Private Limited, 2012.
4. TanweerAlam, Core JAVA, Khanna Book Publishing Company Private Limited, 2015.
5. Y. Daniel Liang, Introduction to Java Programming, 7th Edition, Pearson, 2008.
6. S. Malhotra and S. Choudhary, Programming in Java, 2nd Edition, Oxford University Press, 2014.

Useful Video Links:

Unit No.	Topics	Links
Unit-I	Object Oriented Programming	https://youtu.be/K3g4srbkUNM?si=T6ZFXp78zbROTUKZ
Unit-III	Classes, Objects and Methods	https://youtu.be/GKLL2q6UkHQ?si=Lrx99qYCSIgCTnoT
Unit-IV	Packages	https://youtu.be/TwU3cv1FFis?si=DkfTsgxVnKxrYFU

Course Code	LC-BCA-116B				
Category	Skill Enhancement Courses				
Course Title	Object Oriented Programming using Java Lab				
Scheme and Credits	L	T	P	Credits	Semester-II
	0	0	4	2	
Course Objectives	The objectives of this course are to • To develop understanding of basic Java programming concepts, syntax, and command line arguments. • To develop ability to implement control structures, recursion, arrays, and matrix operations in Java programs. • To develop skills in object-oriented programming including classes, objects, inheritance, polymorphism, and interfaces.				
Assessment	15 Marks				
End Semester Examination	35 Marks				
Total	50 Marks				
Duration of Exam	3Hours				

Course Outcomes: After successful completion of this course, the students will be able to

Cos	Skills Demonstrated	RBT Level
CO1	Apply Java programming concepts to implement basic programs using command line arguments, arrays, strings, recursion, and matrix operations.	Level-3 Apply
CO2	Analyze object-oriented programming concepts by implementing classes, objects, inheritance, polymorphism, and interfaces in Java.	Level-4 Analyze
CO3	Evaluate Java programs using packages, file handling, and string processing to manage and organize data effectively.	Level-5 Evaluate
CO4	Create robust Java applications using exception handling and user-defined exceptions to manage runtime errors.	Level-6 Create

Exp. No.	Contents
1	Write a program to read two numbers from user and print their product
2	Write a program to print the square of a number passed through command line arguments
3	Write a program to send the name and surname of a student through command line arguments and print a welcome message for the student
4	Write a java program to find the largest number out of n natural numbers.
5	Write a java program to find the Fibonacci series & Factorial of a number using recursive and non-recursive functions
6	Write a java program to multiply two given matrices
7	Write a Java program for sorting a given list of names in ascending order
8	Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome
9	Write a java program to read n number of values in an array and display it in reverse order
10	Create a Java class named Student that includes the following attributes: USN, Name, Branch, Phone, and Percentage. Then, write a Java program to create n Student objects and display their USN, Name, Branch, Phone, and Percentage with appropriate headings.
11	Write a Java program that displays the number of characters, lines and words in a text
12	Write a Java program to create a class called Shape with methods called get Perimeter () and get Area (). Create a subclass called Circle that overrides the get Perimeter () and get Area () methods to calculate the area and perimeter of a circle.

13	Write a Java program to create a class Employee with a method called calculate Salary ().Create two subclasses Manager and Programmer. In each subclass, override the calculate Salary() method to calculate and return the salary based on their specific roles
14	Write a Java program using an interface called 'Bank' having function 'rate_of_interest ()'. Implement this interface to create two separate bank classes 'SBI 'and 'PNB 'to print different rates of interest. Include additional member variables, constructors also in classes 'SBI' and 'PNB'.
15	Write a Java package program for the class book and the import the data from the package and display the result.
16	Write a Java program for finding the cube of a number using a package for various data types and then import it in another class and display the results
17	Write a Java program for demonstrating the divide by zero exception handling
18	Write a Java program that reads a list of integers from the user and throws an exception if any numbers are duplicates
19	Create an exception subclass Under Age, which prints "Under Age" along with the age value when an object of Under Age class is printed in the catch statement. Write a class exception Demo in which the method test () throws Under Age exception if the variable age passed to it as argument is less than 18. Write main () method also to show working of the program

Course Code	VAC-102B				
Category	Value Added Courses				
Course Title	Indian Constitution				
Scheme and Credits	L	T	P	Credits	Semester-II
	2	0	0	2	
Course Objectives	The objectives of this course are to • To develop understanding of the Indian Constitution, Fundamental Rights, Duties, and State Policy Principles. • To develop knowledge of the Union Government, including the President, Prime Minister, Council of Ministers, and Parliament. • To develop understanding of the State Government, including the Governor, Chief Minister, Council of Ministers, and Secretariat.				
Assessment	65 Marks				
End Semester Examination	35 Marks				
Total	100 Marks				
Duration of Exam	3Hours				

Course Outcomes: After successful completion of this course, the students will be able to

COs	Skills Demonstrated	RBT Level
CO1	Recall the history, Preamble, Basic Structure, Fundamental Rights, Fundamental Duties, and Directive Principles of the Constitution of India.	Level-1 Remember
CO2	Explain the structure, powers, and functions of the Union Government and the State Government.	Level-2 Understand
CO3	Apply the principles of constitutional governance in the functioning of the Union, State, and Local Administration.	Level-3 Apply
CO4	Apply the role of constitutional institutions, including the Union Government, State Government, Local Administration, and the Election Commission, in strengthening Indian democracy.	Level-4 Apply

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 7 parts of 1 marks each from all units and remaining 8 questions of 7 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit

Unit I

The Constitution-Introduction:

The History of the Making of the Indian Constitution, Preamble and the Basic Structure, and its interpretation, Fundamental Rights and Duties and their interpretation, State Policy Principles.

Unit II

Union Government:

Structure of the Indian Union, President–Role and Power, Prime Minister and Council of Ministers, Lok Sabha and Rajya Sabha.

Unit III

State Government:

Governor–Role and Power, Chief Minister and Council of Ministers, State Secretariat.

Unit IV

Local Administration and Election Commission:

District Administration, Municipal Corporation, Zila Panchayat, Election Commission:Role and Functioning; Chief Election Commissioner; State Election Commission

Suggested Readings:

1. Ethics and Politics of the Indian Constitution by Rajeev Bhargava, Oxford University Press, New Delhi, 2008
2. The Constitution of India by B.L. Fadia Sahitya Bhawan; New edition (2017)
3. Introduction to the Constitution of India by DDBasuLexisNexis;Twenty-Third,2018 edition

Cases

- RustomCavasjeeCooperv. Union of India, (1970) 1SCC248
- State of Rajasthan v. Mohan Lal Vyas, AIR 1971 SC 2068 (confirmation of a private monopoly, not a violation of fundamental right)
- MithileshGargy.UnionofIndia,(1992)1SCC168:AIR1992SC221(Righttocarryon business, not breached when it is liberalised)
- Chintamanrao v. The State of Madhya Pradesh, AIR 1951 SC 118 (scope of reasonable restrictions in relation to trade and occupation)
- Cooverjee B. Bharucha v. Excise Commissioner, Ajmer, AIR 1954 SC 220 (the reasonablenessoftherestrictionimposedmaydependuponthenatureofthebusinessand prevailing conditions including public health and morality)
- T.B.Ibrahimv.RegionalTransportAuthority.Tanjore,AIR1953SC79
- HarmanSinghv.RTA,Calcutta,AIR1954SC190
- Dwarka Prasad LaxmiNarainv. State of U.P., AIR1954SC224
- State of Bombay v. R.M.D. Chamarbaugwala, AIR1957SC699
- Parbhani Transport Coop. Society Ltd. v. Regional Transport Authority, Aurangabad, AIR 1960 SC 801
- State of Bombayv. R.M.D. Chamarbaugwala,(1957)S.C.R.874,
- G.K. Krishnan vs State of TamilNadu, 1975SCC(1)375
- Automobile Transport (Rajasthan Ltd. Vs State of Rajasthan, AIR1962SC1406

Useful Video Links:

Unit No.	Topics	Links
Unit-I	The Constitution-Introduction	https://youtu.be/0DbQ_Eq8wJ0?si=oqdHYKQ5sdOk4Foc
Unit-II	Union Government	https://youtu.be/qZd39cdEJgA?si=b4cGMR8JAN_3KL9
Unit-III	State Government	https://youtu.be/qZd39cdEJgA?si=1qfpidO28RjbvVE4
Unit-IV	Local Administration and Election Commission	https://youtu.be/a0_FuX41GzU?si=MFnYp0e5xbOy0trh

Course code	AEC-106B				
Category	Additional Courses				
Course title	Hindi				
Scheme and Credits	L	T	P	Credits	Semester-II
	1	1	0	2	
Course Objectives	The objectives of this course are • विद्यार्थियोंकोहिन्दीभाषाकेमहत्त्वएवंगुणवत्तासेसुविज्ञकरवाकरहिन्दीकीओरउन्मुखकरना। • विद्यार्थियोंकोहिन्दीभाषाकीवैज्ञानिकताकेविषयमेंबतलाकरइसकेगौरवसेसुपरिचितकरवाना। • हिन्दीभाषाकेमाध्यमसेनवयुवक-नवयुवतियोंकोराष्ट्रीयताकेपुनीतभावोंकीओरउन्मुखकरना।				

Course Outcomes: After studying this course, the students will be able to

CO	Skills Demonstrated	RBT Level
CO1	लिपि भाषा और साहित्य के बुनियादी सिद्धांतों का अवलोकन करें।	Level-1 Remember
CO2	भाषा की संरचनाएँ अर्थ और अभिव्यक्ति के पहलुओं की समझ विकसित करें।	Level-2 Understand
CO3	भाषाई और साहित्यिक सिद्धांतों को वास्तविक जीवन में लागू करने की क्षमता प्राप्त करें।	Level-3 Apply
CO4	भाषा, लिपि और साहित्य के विभिन्न पहलुओं का विश्लेषण करके जटिल साहित्य और सांस्कृतिक मुद्दों को समझें।	Level 4 Analyze

Unit No-I

लिपिकामानकीकरणमानकवर्णमाला, देवनागरी अंकमाला, अनुस्वार और विसर्ग, अनुनासिक, वर्तनी की शुद्धता के लिए ध्यान देने योग्य बातें, वर्तनी संबंधी अशुद्धियों के कारण, वर्तनी संबंधी अशुद्धियों को दूर करने के उपाय।

Unit-II

सृजनात्मक साहित्य का अर्थ, परिभाषा और स्वरूप: आलोचनात्मक साहित्य का अर्थ, परिभाषा और स्वरूप: सृजनात्मक साहित्य का भाषा विकास में महत्त्व, निबंध लेखन, कहानी लेखन, काव्य लेखन।

Unit-III

अनुवाद अर्थ, परिभाषा और स्वरूप व अनुवाद का महत्त्व, अनुवाद के गुण, अनुवाद के प्रकार, अनुवाद में कंप्यूटर का योगदान, सीरियलों का हिंदी अनुवाद, बैकिंग साहित्य का अनुवाद, डबिंग क्षेत्र में अनुवाद, लिप्यंतरण, हिंदी साहित्य का अन्य भाषाओं में अनुवाद, अनुवाद क्षेत्र में रोजगार।

Unit-IV

पत्र प्रस्तुतीकरण का अर्थ, पत्र प्रस्तुतीकरण और नवीन शोध आत्मक वैचारिकता, पत्र प्रस्तुतीकरण और शिक्षक की भूमिका, प्रस्तोता का मनोबल, वक्तृत्व कला का विकास, शोध आत्मक अभिरुचिका विकास

प्रेरणास्पद पुस्तकें:

- शुद्ध लेखन और हिन्दी का मानक रूप—डॉ० हरिश्चन्द्र वर्मा, विद्या भारती, संस्कृति शिक्षा संस्थान, कुरुक्षेत्र (हरियाणा)।

- बृहत्हिन्दीकोश— सम्पा०कालिकाप्रसाद, राजवल्लभसहाय, मुकुन्दीलालश्रीवास्तव, ज्ञानमण्डललिमिटेड, वाराणसी।
- परिशोध—मुख्यसम्पादक:डॉ०लक्ष्मीनारायणशर्मा, मानव-मूल्यविशेषांक, 1993।
- भारतीयजीवनमूल्य—डॉ०धर्मपालमैनी, भारतीयसंस्कृतिसंस्थान, गुड़गाँव।
- बृहत्प्रशासनशब्दावली(हिन्दी-अंग्रेजी) — वैज्ञानिकतथातकनीकीशब्दावलीआयोग, नईदिल्ली-110006।
- बृहत्प्रशासनशब्दावली(अंग्रेजी-हिन्दी) — वैज्ञानिकतथातकनीकीशब्दावलीआयोग, नईदिल्ली-110006।
- बृहत्पारिभाषिकशब्द-संग्रह(मानविकी), खंड-1
वैज्ञानिकतथातकनीकीशब्दावलीआयोग, केन्द्रीयहिन्दीनिदेशालय, शिक्षातथासमाजकल्याणमंत्रालय, भारतसरकार।
- प्रयोजनमूलकअनुवाद— डॉ०सुरेशसिंघल, मोनिकाप्रकाशन, दिल्ली-110053।
- अनुवादसिद्धान्तएवंव्यवहार—डॉ०सुरेशसिंघल, अभिनवप्रकाशन, दिल्ली-6।

Useful Video links:

Unit No	Topics	Links
Unit-I	लिपिकामानकीकरण	https://www.youtube.com/watch?v=g1jcWLojn4&t=2s
Unit-II	सृजनात्मकसाहित्यकाअर्थ	https://www.youtube.com/watch?v=aUOgArzWtTU
Unit-III	अनुवाद	https://www.youtube.com/watch?v=B1-xF-WBDXI
Unit-IV	प्रस्तुतीकरणकाअर्थ	https://www.youtube.com/watch?v=NkXI3lgDkrw