



Prestige Institute of Management & Research, Gwalior

UGC NAAC ACCREDITED 'A' GRADE AUTONOMOUS INSTITUTE

AFFILIATED TO JIWAJI UNIVERSITY, GWALIOR & RGPV, BHOPAL

Course Curriculum

(As per new amendment of NEP 14.1)

for

Bachelor of Computer Applications

(BCA)

(A.Y.: 2025 – 2026)



PRESTIGE

INSTITUTE OF MANAGEMENT & RESEARCH, GWALIOR

AN AUTONOMOUS INSTITUTE ACCREDITED WITH UGC NAAC GRADE 'A'



Prestige Institute of Management & Research, Gwalior

UGC NAAC ACCREDITED 'A' GRADE AUTONOMOUS INSTITUTE

AFFILIATED TO JIWAJI UNIVERSITY, GWALIOR & RGPV, BHOPAL

BCA I Semester

Prestige Institute of Management and Research, Gwalior											
Four Years (8 Semester) CBCS Programme											
Teaching and Examination Scheme											
First Semester (2025-26) NEP											
S. No.	Code	Subject	Category	Lecture	Practical	Credits	Contacts Hrs /Wk	Internal	External	Total	
								Max	Max	Max	Min
1	BCA - 101	Computer Architecture (Theory)	Major-1	4	-	4	4	30	70	100	35
2	BCA - 102	Business Statistics	Minor-1	4		4	4	30	70	100	35
3	BCA - 103	Information Technology	MDE	2	-	2	2	30	70	100	35
4	BCA - 104	English	AEC	2	-	2	2		50	50	17
5	BCA - 105	Personality Development	SEC	1		1	1		100	100	35
6	BCA - 106	Community Engagement (CE)	PW/CE			2	2		50	50	17
7	BCA - 107	Computer Architecture (Practical)	Major-1		2	2	2		100	100	35
8	BCA - 108	Information Technology (Practical)	MDE		1	1	1		100	100	35
9	BCA - 109	Personality Development (Practical)	SEC		2	2	2		100	100	35
		Total		13	5	20	20	90	710	800	279

BCA II Semester

Prestige Institute of Management and Research, Gwalior											
Teaching and Examination Scheme											
Four Years (8 Semester) CBCS Programme											
Second Semester (2025-26) NEP											
S. No.	Code	Subject	Category	Lecture	Practical	Credits	Contacts Hrs /Wk	Internal	External	Total	
								Max	Max	Max	Min
1	BCA - 201	Programming Methodology (Theory)	Major-2	4	-	4	4	30	70	100	35
2	BCA - 202	Data Structures (Theory)	Major-3	4		4	4	30	70	100	35
3	BCA - 203	Business Organization and Communication	Minor-2	4	-	4	4	30	70	100	35
4	BCA - 204	Hindi	AEC	2	-	2	2		100	100	17
5	BCA - 205	(Swayam/NPTEL/Offline Course*)	VAC-I			2	2				
6	BCA - 206	Programming Methodology (Practical)	Major-2		2	2	2		100	100	35
7	BCA - 207	Data Structures (Practical)	Major-3		2	2	2		100	100	35
		Total		14	4	20	20	90	510	600	192

* It is mandatory to submit a certificate.

MDE	Multi-Disciplinary Evaluation (MDE)
AEC	Ability Enhancement course (AEC)
SEC	Skill Enhancement Course (SEC)
PW	Project Work (PW)
CE	Community Engagement (CE)
AEC	Ability Enhancement course (AEC)
VAC	Value Added Courses (VAC)



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INSTITUTE OF MANAGEMENT & RESEARCH, GWALIOR
AN AUTONOMOUS INSTITUTE ACCREDITED WITH UGC NAAC GRADE 'A'

BCA First Semester
Course Curriculum
2025-26

PART A: Introduction			
Program: Certificate		Class: B.C.A.	Year: I Year
Session: 2025-26			
Subject: Computer Applications			
1.	Course Code	BCA-101	
2.	Course Title	Computer Architecture (Theory)	
3.	Course Type (Core Course/DSE/Minor/MD-ID/SEC/VOC)	Major –I (Core Course)	
4.	Pre-Requisite (if any)	To study this course, a student must have basic knowledge of Computers.	
5.	Course Learning Outcomes (CLO)	After the completion of this course, a successful student will be able to do the following: <ol style="list-style-type: none"> 1. Understand the basic structure, operation and characteristics of digital computer. 2. Design simple combinational digital circuits based on given parameters. 3. Familiarity with working of arithmetic and logic unit. 4. Know about hierarchical memory system including cache memories and virtual memory. 5. Know the contributions of Indians in the field of computer architecture and related technologies. 	
6.	Credit Value	Theory – 4 Credits	
7.	Total Marks	Max. Marks : 30 + 70	Min. Passing Marks: 35

PART B: Content of the Course		
No. of Lectures (in hours per week): 2 Hrs. per week		
Total No. of Lectures: 60 Hrs.		
Module	Topics	No. of Lectures
I	Indian Knowledge System: Ancient Indian Contribution in Computer Architecture: Pingala's "Chandahśāstra", Panini Sanskrit Grammar. Modern Contribution: Dr. Vinod Dhami, Dr. Ajay Bhat, Dr. Vinod Khosla, Dr. Vijay P Bhatkar. Suggested Activities: Debate on Pingala's "Chandahśāstra", Panini Sanskrit Grammar. Solve real-world problems inspired by PARAM's computational models. Discuss on Indian contributions to computing,	02



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II	<p>Fundamentals of Digital Electronics: 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, Excess-3 Code, The Gray Code.</p> <p>Logic Gates, Boolean Algebra, Map Simplification, Combinational Circuits, Sequential Circuits, simple combinational circuit design problems.</p> <p><i>Suggested Activities: Assignment on number systems, Verifying logic gates through truth tables,</i></p>	12
III	<p>Combinational Circuits: Half Adder and Full Adder, Subtractor, Decoders, Encoder, Multiplexer, Demultiplexer.</p> <p>Sequential Circuits: Flip-Flops- SR Flip- Flop, D Flip-Flop, J-K Flip-Flop, T Flip-Flop.</p> <p>Register: 4 bit register with parallel load, Shift Registers- Bidirectional shift register with parallel load Binary.</p> <p>Counters: 4 bit synchronous and Asynchronous binary counter.</p> <p><i>Suggested Activities: Designing combinational circuits, Hands-on session on designing adders and multiplexers, use simulation software to design basic combinational circuits, Students work in teams to optimize logic circuits for efficiency, Debate on advancements in digital logic design.</i></p>	12
IV	<p>Basic Computer Organization: Instruction codes, Computer Registers, Computer Instructions, Timing & Control, Instruction Cycles, Memory Reference Instruction, Input - Output & Interrupts, Instruction formats, Addressing modes, Instruction codes, Machine language, Assembly language.</p> <p>Register Transfer and Micro operations: Register Transfer Language, Register Transfer, Bus & Memory Transfer, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations.</p> <p><i>Suggested Activities: Understand how processors access operands in memory, Implement AND, OR, XOR operations at the bit level, explore Panini's rule-based grammar and compare it with modern instruction set design, debate on addressing modes and their use cases.</i></p>	12
V	<p>Processor and Control Unit: Hardwired vs. Micro programmed Control Unit, General Register Organization, Stack Organization, Instruction Format, Data Transfer & Manipulation, Program Control, Introductory concept of RISC, CISC, advantages and disadvantages of both.</p> <p>Pipelining: concept of pipelining, introduction to Pipelined data path and</p>	12



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	control – Handling Data hazards & Control hazards.	
	<i>Suggested Activities: Debate on Hardware vs. Microprogrammed Control, Assignment on designing a simplified processor. Discussion on RISC vs. CISC architectures, Analyze how modern processors handle instruction execution.</i>	
VI	<p>Memory and I/O Systems - Peripheral Devices, I/O Interface.</p> <p>Data Transfer Schemes - Program Control, Interrupt, DMA Transfer, I/O Processor.</p> <p>Memory Hierarchy, Processor vs. Memory Speed, High-Speed Memories, Main memory, Auxiliary memory, Cache Memory, Associative Memory, Interleaving, Virtual Memory, Memory Management.</p> <p>Ancient Manuscript Storage (Nalanda, Takshashila Libraries): Similarity to hierarchical memory and indexing methods.</p> <p><i>Suggested Activities: Understanding memory allocation in modern computers, Compare manuscript storage methods with modern hierarchical memory, Field Visit (if possible): Visit a digital archive/library to understand memory organization.</i></p>	10

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings:

Textbooks:

1. Gerard G. Emch, R. Sridharan, M. D. Srinivas: Contributions to the History of Indian Mathematics, Hindustan Book Agency, Vol. 3, 2005.
2. Udayan S. Patankar & Sunil M. Patankar: Elements of Vedic Mathematics, TTU Press, Tallinn 2018.
3. M. Morris Mano: “Computer System Architecture”, PHI.
4. Heuring Jordan: “Computer System Design & Architecture” (A.W.L.).
5. Donald P Leach, Albert Paul Malvino, Goutam Saha: “Digital Principles & Applications”, Tata McGraw Hill Education Private Limited, 2011 Edition.
4. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें।

Reference Books:

1. William Stalling, “Computer Organization & Architecture”, Pearson Education Asia.
2. V. Carl Hamacher, “Computer Organization”, TMH
3. Tannenbaum, “Structured Computer Organization”, PHI.
6. Er. Rajiv Chopra, “Computer Architecture”, Revised 3rd Edition, S. Chand & Company Pvt. Ltd



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Suggested Digital Platforms & Web links:
https://epgp.inflibnet.ac.in https://www.eshiksha.mp.gov.in/mpdhe
Suggested Equivalent Online Courses:
https://nptel.ac.in/courses/106/105/106105163/ https://nptel.ac.in/courses/106/106/106106166/ https://nptel.ac.in/courses/106/106/106106134/

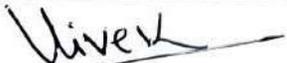
Part D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks:		100
Continuous Comprehensive Evaluation (CCE):		30 Marks
University Exam (UE):		70 Marks
Internal Assessment:		Total Marks: 30
Continuous Comprehensive Evaluation (CCE)		
External Assessment:	Section (A) : Very Short Questions Section (B) : Short Questions Section (C) : Long Questions	Total Marks: 70
University Exam Section Time: 03.00 Hours		



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Theory Paper

Part A - Introduction			
Program: Certificate	Class: BBA	Year: First	Session: 2025-26
Subject: Business Statistics			
1	Course Code	BCA 102	
2	Course Title	BBA	
3	Course Type (Major Course /Elective/ Generic Elective/Minor/Vocational/...)	Minor - I	
4	Pre-requisite (if any)	Not Required	
5	Course Learning outcomes (CLO)	On successful completion of this course, the students will be able to: <ol style="list-style-type: none">1. Statistical Research Tools will increase students' ability to understand how to perform social researches.2. Students will be equipped with knowledge about analyzing professional reports and will be able to make decisions based on the reports analyzed.3. Students will learn about Quantization, analysis of performance relationship.	
6	Credit Value	04	


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7	Total Marks	Max. Marks: 30+70	Min. Passing Marks:35
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Part B-Content of the Course		
Total No. of Lectures-Tutorials-Practical (2 hours per week): L-T-P: 60 Hours		
Unit	Topics	No. of Hours
Unit 1	<p>Introduction to Statistics - Evolution of Statistics in India, Role of Statistical Methods in Indian Agriculture, Contribution of Ancient Indian Mathematicians in Statistics. Meaning, Definition and Scope of Statistics, Statistical Investigations and Laws of Statistics.</p> <p>Activity 1: Student will be divided into groups. They will find out examples related to limitations of statistics and make a poster/collage on it.</p> <p>Activity 2: Student will be divided into groups. They will prepare a flow chart of the Steps of Statistical Investigation with an appropriate example.</p>	10
Key words: Statistics, Laws of Statistics.		
Unit 2	Collection & Presentation of Data - Collection of Data, Methods of Data Collection, Primary and Secondary Data, Presentation of Data, Frequency Distribution.	12



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	<p>Activity 1: Students will be divided into groups. Each group will be given a topic on which they will prepare a Questionnaire.</p> <p>Activity 2: Students will be divided into groups. They will be given a topic based on which they will be carrying out a survey among their classmates/college students. Students will then prepare an appropriate table and graph to represent the data collected by them.</p>	
Key words: Data Collection, Survey, Sampling, Graphs.		
Unit 3	<p>Measures of Central Tendencies - Methods of calculation of Mean, Median and Mode and its utility, Methods of calculation of Geometric Mean and Harmonic Mean and its utility.</p> <p>Activity 1: Students will be divided into groups. Student will record data related to any sports activity of their choice. Using the recorded data, they will calculate the mean, median, mode and geometric mean.</p> <p>Activity 2: Students will be divided into groups. They will visit the nearest grocery market. Find out the price per kilogram if they purchase only 1 kilogram & price per kilogram if they purchase 10 kilograms of any vegetable/fruit from different shopkeepers. They will then calculate the mean, median and mode of the prices.</p>	12
Key words: Mean, Median, Mode.		
Unit 4	<p>Measures of Dispersion - Standard Deviation and Mean Deviation – Meaning and Scope. Skewness – Concept and Methods.</p>	13

	<p>Activity 1: Students will be divided into groups. Students will record data related to any sports activity of their choice. Using the recorded data, they will calculate the Standard Deviation & Mean Deviation.</p> <p>Activity 2: Students will be divided into groups. Students will create a themed collage using cut-outs to visually represent symmetric, positively skewed, and negatively skewed data distributions.</p>	
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Key words: Standard Deviation, Skewness.

Unit 5	<p>Correlation Analysis - Karl Pearson's Coefficient of Correlation, Spearman's Rank Correlation – Methods. Regression - Lines of Regression, Methods.</p> <p>Activity 1: Students will be divided into groups. Students will measure their height (in cm.) and record their shoe size (in cm.). Using the collected data, they will calculate the correlation coefficient between height and shoe size.</p> <p>Activity 2: Students will be divided into groups. Students will find out average temperature of a city and electricity bill of any household in the city for few months. Using regression analysis, they will calculate a regression coefficient between temperature and electricity bill.</p>	13
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Key words: Correlation, Regression.

Part C-Learning Resources

Text Books, Reference Books, Other resources



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Suggested Readings:

1. Berenson, Mark L. and Levine, David M., Basic Business Statistics: Concepts and Applications, Pearson Education, New York (2022).
2. Bhardwaj, R.S., Business Statistics, Excel Books, New Delhi (2019).
3. Elhance, D.N., Fundamentals of Statistics, Kitab Mahal, Allahabad (2018).
4. Gupta, S.C., Fundamentals of Statistics, Himalaya Publishing House, Mumbai (2023).
5. Gupta, S.P., Business Statistics, Sultan Chand and Sons, New Delhi (2023).
6. Kothari, S.L. (Dr.) and Kothari, Milind (Dr.), Sankhyaki Ke Siddhant, Madhya Pradesh Hindi Granth Academy, Bhopal (2021).
7. Mehta, C.M. (Dr.), Dave, Dinesh (Dr.), Mathur, Neha (Dr.), Agrawal, Hariom (Dr.), and Rathore, Krishngopal (Dr.), Sankhyaki, Madhya Pradesh Hindi Granth Academy, Bhopal (2020).
8. Mehta, C.M. (Dr.), Dave, Dinesh (Dr.), Krishna, Gopal (Dr.), Agrawal, Hariom (Dr.), and Mathur, Neha (Dr.), Vyavsayik Sankhyaki, Madhya Pradesh Hindi Granth Academy, Bhopal (2022).
9. Shukla, S.M. (Dr.) and Sahai, H.S. (Dr.), Business Statistics (Hindi and English, both Medium), Sahitya Bhawan Publications, Agra (2021).
10. Tulsian, P.C. (Dr.), Statistical Analysis, S.Chand Publications, Delhi (2022).
11. Vohra, N.D., Business Statistics, Tata McGraw Hill, New Delhi (2020).

Suggestive digital platforms weblinks:

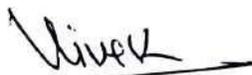
<http://ndl.iitkgp.ac.in/he document/openstax/IN O 1 I B S 2 114 115>

<http://ndl.iitkgp.ac.in/he document/nptel/IN N 1 M 18419 N B S 21411 21412>

<http://ndl.iitkgp.ac.in/he document/dishtavo/D D I S F H T A V O B O C B S I G C 347554921>

<http://ndl.iitkgp.ac.in/he document/fossee/IN R T C 7 B S F C D M b K B 514 515>

Suggested equivalent online courses: Through NPTEL and SWAYAM portal.



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Part D-Assessment and Evaluation

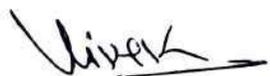
Suggested Continuous Evaluation Methods:

Maximum Marks: 100

Continuous Comprehensive Evaluation (CCE): 30 marks University Exam (UE): 70 marks

Internal Assessment: Continuous Comprehensive Evaluation (CCE):	Class Test Assignment/Presentation As per Ordinance Number 14 (1)	Total 30
External Assessment: University Exam Section: Time :03.00Hours	Section(A): Objective Type Quotations Section (B): Short Questions Section(C): Long Questions	Total 70

Any remarks/suggestions: Theoretical exposition should be accompanied by Discussions, Case-Studies preferably with Indian Context, Presentations and Industry Based Assignments.



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Information Technology

PART A: Introduction			
Program : Under Graduate Course		Level - Beginner	Session:2025-26
Subject : Information Technology			
1	Course Code	V1-COS-IT-BCA-103	
2	Course Title	Information Technology	
3	Course Type	Multidisciplinary	
4	Pre-Requisite(if any)	No Pre-Requisite	
5	Course Learning Outcomes(CLO)	<p>On completion of this course, learners will be able to:</p> <ol style="list-style-type: none"> 1. Understand IT components & its applications 2. Promote digital literacy, ethical awareness, and cyber hygiene. 3. Exposure to IT tools for office work including Indian languages 4. Encourage healthy and mindful habits through yoga and Indian values. 5. Introduce learners to emerging technologies like AI and cloud platforms. 	
6.	Credit Value	Theory—2 Credits	
7.	Total Marks	Max. Marks :	Min. Passing Marks :
PART B : Content of the Course			
No. of Lectures (in hours per week): 2 Hrs. per week			
Total No. of Lectures: 30			
Module	Topics	No. of Lectures	
1	<p>Fundamentals of Information Technology & Indian Knowledge Systems History of Computing: From Ancient Indian contributions (e.g., binary logic in Pingala's Chandaḥśāstra) to modern IT Overview of Computer Systems: Hardware, Software, I/O Devices, Memory Operating Systems (Windows/Linux), File Management Introduction to Number Systems with Indian numeral history Concept of Digital India and e-Governance initiatives Activity :</p> <ol style="list-style-type: none"> 1. Visit to a Digital Seva Kendra (Common Service Center) 2. Create a poster on Indian IT innovations (ISRO, Aadhaar, etc.) 	7	

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Information Technology

II	<p>Office Tools, Language & Communication in IT Word Processing, Spreadsheets, and Presentations Use of local languages in IT (Unicode, Google translation tools, Indic typing tools) English for IT: Email Writing, IT vocabulary, presentation skills Language models and voice-to-text (Google Lens, ChatGPT, AI typing tools) UPI and QR Code : Introduction, Functionality, Challenges and Application in Indian context. Activity :</p> <ol style="list-style-type: none"> 1. Prepare a bilingual presentation (English + regional language) 2. Draft an email for a job application and create a digital resume 	7
III	<p>Internet, AI Tools & Cyber security Awareness Introduction to Internet, Cloud, and Email Cyber security basics: Phishing, Malware, Identity Theft Digital Ethics and Indian perspectives on "Dharma in Technology" Hands-on: Google Workspace, ChatGPT, Canva, Gemini, Indian AI tools Cybercrime awareness: Government portals (CERT-IN, Cyber Crime Reporting Portal). Activity :</p> <ol style="list-style-type: none"> 1. Mock simulation of cybercrime reporting 2. Create a “Stay Safe Online” digital awareness video or poster. 	6
IV	<p>Text and Image Data: Introduction, Storage Formats for pictures, Image compression fundamentals, Image acquisition with Digital Camera. Audio Data: Introduction, Audio Signals, Acquisition and Storage, Compression Video Data: Introduction, Capturing a moving scene with Video Camera, Compression, MPEG compression standard. Activity :</p> <ol style="list-style-type: none"> 1. Understand how digital images are captured, stored in various formats, and compressed, while analyzing the impact of these factors on quality and size. 2. Understand how audio and video data are captured, stored, and compressed, and how different formats and compression levels affect quality and file size. 	5
V	<p>IT Profession, Indian Values, Yoga & Social Impacts of Technology Careers in IT: Freelancing, BPO, Data Entry, Web Development, AI Work ethics, time management, and digital wellbeing Indian Values: Satya, Ahimsa, and Seva in Tech Service Yoga for concentration, posture correction, and stress management for IT users</p>	5

Department of Higher Education, Madhya Pradesh
Information Technology

	Social implications: Digital divide, screen addiction, misinformation. Activity : <ol style="list-style-type: none"> 1. Daily 5-minute yoga for eyes and back (Demonstration & practice) 2. Conduct a debate: “Has Technology made us more connected or more isolated?” 	
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Keywords/ Tags:

PART C: Learning Resources

Text books, Reference Books, Other Resources

Suggested Readings:

- Introduction to Information Technology By RAJARAMAN V., PHI Learning Pvt. Ltd. (Fourteenth Printing, Third Edition, January 2018)
- “Fundamentals of Information Technology” – Alexis Leon & Mathews Leon
- Vedic Mathematics 2005, Sterling Publishers Pvt. Ltd. ISBN 978-81-7963-001-3 Reprint 2006, 2009
- “Digital Literacy Curriculum” – MeitY (Govt. of India)

Suggestive digital platform web links:

- National Digital Library of India (NDLI)
en.wikipedia.org/wayam.gov.in
- SWAYAM “Fundamentals of Information Technology” (AMU)
swayam.gov.in+11onlinecourses.swayam2.ac.in+11classcentral.com+11.
<https://www.nielit.gov.in/content/digital-literacy-courses>

Suggestive equivalent online courses:

- Diksha Portal, NPTEL, Cyber Surakshit Bharat
- MyGov Cyber Safety Module
- AI Tools Practice : ChatGPT, Bard/Gemini, Canva, Grammarly, Scratch/Python IDEs
- **SWAYAM – Fundamentals of IT (AMU)**
– Comprehensive coverage of Module I, including history, hardware, OS, memory, number systems, and an intro to cybersecurity
onlinecourses.swayam2.ac.in+15onlinecourses.swayam2.ac.in+15testbook.com+15.
- **SWAYAM – Course in Information Technology (Savitribai Phule Pune Univ.)**
– A 30-module, 8-week program with cloud introduction, Google Workspace, e-Governance concepts and basic security
onlinecourses.swayam2.ac.in+1swayam.gov.in+1.
- **IIT Madras C Programming & Assembly Language (SWAYAM)**
– Ideal for Module IV: hands-on programming, logical thinking, algorithms, flowcharts, and connection to hardware fundamentals

PART D : Assessment and Evaluation

Internal Assessment : Continuous Comprehensive Evaluation (CCE): 40 Marks		End Term Examination(s) : 60 Marks Time : 03:00 Hours	
Class Test	Marks		
Presentation/Assignment/Quiz/Group Discussion	Marks		
Appropriate weight	Marks		

Department of Higher Education, Madhya Pradesh
Information Technology

age of attendance in the class			
Total	Marks	Total: 100	Marks
Any Remarks/ Suggestions:			

COURSE OUTLINE

ENGLISH PAPER CODE: BCA 104	Max. Marks: 50 Min. Marks: 18 External 30 Internal: 20
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Credits: 02

Course Outcomes:

CO1a	Students will be able to acquire a wide vocabulary and understanding of basic functional grammar and knowledge for reading, writing and spoken language.
CO1b	Students will be able to develop creative and critical writing skills along with developing an interest and appreciation of literary texts.
CO2	To enable the learners to communicate effectively and appropriately in real life situations.
CO3	Students will be able to demonstrate the use of basic and advanced business writing skills and to produce clear and concise written business documents.
CO4	Students will be able to summarize and synthesize information into a coherent text and develop language competence, presentation and public speaking skills.

CO PO PSO Matrix:

Cos	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
CO1a	1	1	-	2	2	1	-	1
CO1b	2	2	-	2	3	1	1	2
CO2	2	1	1	3	2	1	2	2
CO3	2	2	2	1	2	2	1	1
CO4	2	2	1	2	3	2	1	2

Course Mapping:

Local	Regional	National	Global
Y	Y	Y	Y

Professional Ethics	Gender	Human Values	Environment & Sustainability
Y	Y	Y	Y

Employability	Entrepreneurship	Skill Development
Y	Y	Y

Course Pedagogy:

Lecture, PPT's, Role plays, Mock Group Discussions, Extempore, JAM etc.

Course Content:

UNIT 1: Review of English Grammar, Vocabulary Building (Synonyms, Antonyms, Homonyms, Idioms, Proverbs, One word substitution), Paragraph Writing, Precis Writing, Report Writing

UNIT 2: Where the Mind is without fear by R.N. Tagore, Life by Sarojini Naidu, Our Trees Still grow in Dehra by Ruskin Bond, The Bird with the Golden Wings by Sudha Murthy

UNIT 3: Communication- Definition and Process of Communication, Essentials of Effective Communication, Barriers to Communication & Role of Communication in Organizational Effectiveness, Non-Verbal Communication: Meaning, Types and Importance, Listening, Difference between Listening and Hearing

UNIT 4: Business Correspondence, Essentials of Effective Business Correspondence, Structure of Business Letter, Types of Business Letter: Enquiry, Reply, Orders, Complaints, and Circular Letter, Writing Emails, Drafting of Notices, Agendas, Minutes, Job Application Letters, Preparation of a Curriculum Vitae (CV) and Resume, their difference and usage.

UNIT 5: Public Speech – Composition Principles, Speech Delivering Skills, Group Discussion: Do's and Don'ts of Group Discussions, Communication in Committees, Seminars and Conferences

Suggested Readings:

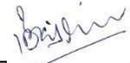
- Chaturvedi, P.D, Mukesh. *The Art and Science of Business Communication*. 4th ed. 2017, Pearson, India
- Higgins, Jessica. *10 Skills for Effective Business Communication*. Foreword by Ben Way 2021. Embassy Books, India.
- Kumar, Sanjay & Pushp Lata. *Communication Skills*. 2nd ed. 2015. Oxford University Press, India
- Swan, Michael. *Practical English Usage* 4th Ed, 2016. Oxford University Press, India.
- Wren and Martin. *High School English Grammar & Composition*. Revised by NDV Prasada Rao. Regular Edition, S. Chand Publishing. India.

Course Evaluation Criteria:

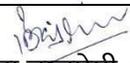
Instruments	Marks
Mid Term Exam	10
Assignment 1	2.5
Assignment 2	2.5
Class Participation (Skill Development)	5
Total Marks- Internal Examination	20

Unit	Marks
1	10
2	10
3	10
Total Marks- External Examination	30
Total Marks- Internal +External Examination	50

PART A: Introduction			
Program : Certificate Course		Class : B.A./B.Sc./B.Com.	Year : 1st Year
Session : 2025 – 26			
Subject: Personality Development			
1.	Course Code	BCA-105	
2.	Course Title	Personality Development	
3.	Course Type	Skill Enhancement Course	
4.	Pre- Requisite	Open for all	
5.	Course Learning Outcomes (CLO)	<p>By the end of this course, learners will be able to:</p> <ol style="list-style-type: none"> 1. Cultivate skills for successful life 2. Understand the importance of human values 3. Develop core skills for employability 4. Develop effective communication skills 5. Realize the role of technology in personality development. 	
6.	Expected Job Role / Career Opportunities	<p>This course equips individuals with essential soft skills such as communication, confidence, leadership, and emotional intelligence, which are highly valued across various industries. Career opportunities after such a course include roles like corporate trainer, life coach, public speaker, HR executive, and customer service representative. It also enhances prospects in sales, marketing, teaching, entrepreneurship etc. Also prove beneficial in interviews of various competitive exams.</p>	
7.	Credit Value (Theory)	1 Credit	
8.	Total Credit Value	3 Credit (1 Credit Theory & 2 Credit Practical)	
9.	Total Marks	Max. Marks: 100	Min. Passing Marks: 35
PART B : Content of the Course (Theory)			
Total No. of Lectures: 15 Hrs., L – T – P : 1 – 0 – 0			
Unit	Topics		No. of Lectures (15 Hrs.)


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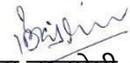
I	Indian Knowledge System and Personality <ol style="list-style-type: none"> 1. Personality - Meaning, characteristics and importance 2. Human values and personality development - Empathy, compassion, spirit of service 3. Components of personality development in the Indian knowledge system. 	5 Hrs
	Keywords - Human Values, Empathy and Compassion, Character Building, Ethics and Morality, Value-based Education, Self-awareness and Self-discipline, Spirituality and Personality	
	Activity - <ol style="list-style-type: none"> 1. Assignment on the life sketch of any one of the great soul (Patanjali, Vedvyas, Gautam Buddha, Mahaveer Swami, Kabirdas, Gurunanakdev) 2. Chart making on the Components of Personality 	
II	Personality Development <ol style="list-style-type: none"> 1. Agencies of Personality Development : <ul style="list-style-type: none"> ● Family Atmosphere - Parenting style, family values and emotional support. ● Peer Group - Team Spirit, Self image, Social learning ● Formal Education - Scout and guide, N.S.S., N.C.C., Sports ● Personal Efforts and Yoga - Self motivation, Goal, meditation and sound health. 2. Barriers of Personality Development 	5 Hrs
	Keywords - Parenting Style, Family Values, Emotional Support, Peer Group Influence, Team Spirit, Sports and Discipline, Goal Setting, Mind-Body Balance, Negative Peer Influence, Family Conflicts	
	Activity - <ol style="list-style-type: none"> 1. Pictorial Presentation of various yoga mudras and reports. 2. Group discussion and report writing on Personality development. 	
III	Communication Skills and Personality Development <ol style="list-style-type: none"> 1. Communication Skills: Meaning, Characteristics , types, importance. 2. Role of communication Skills in Personality Development- Stage confidence, Body language, Voice modulation 	5 Hrs
	Keywords - Effective Communication, Interpersonal Communication, Formal and Informal Communication, Non-Verbal Cues, Presentation Skills, Self-Expression, Listening Skills, Soft Skills Development, Expressive Skills, Personality Projection, First Impressions	
	Activity -	


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	1. Pictorial Report writing on any cultural or academic programme held in College.	
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Part C-Learning Resources	
Text Books, Reference Books, Other resources	
<ol style="list-style-type: none"> 1. Andrews, Sudhir (1988). How to Succeed at Interviews. 21st (rep.) Tata McGraw-Hill, New Delhi. 2. Covey, Stephen. (1989). The 7 Habits of Highly Effective People. NY: Free Press 3. Hindle, Tim (2003). Reducing Stress. Essential Manager series. Dk Publishing. 4. Lucas, Stephen (2001). Art of Public Speaking. Tata - Mc-Graw Hill, New Delhi. 5. माडडन, स्टीट, "व्यक्ततत्त्वि का विकास", आनंद पेपरबैतस। 6. Petes S. J., Francis (2011). Soft Skills and Professional Communication. Tata McGraw-Hill Education, New Delhi 7. शमाड, पी. के., (2014) "व्यक्ततत्त्वि विकास", भारतीश्री प्रकाशन। 8. Smith, B. (2004). Body Language. Rohan Book Company, Delhi. 	
Suggestive digital platforms web links:	
<ol style="list-style-type: none"> 1. Basics of Communication: https://www.glowandlovelycareers.in/en/course-detail/niit-156/basics-of-communication 2. Social Etiquettes: https://www.glowandlovelycareers.in/en/course-detail/englishedge-904/social-etiquette 3. Self-Presentation: https://www.glowandlovelycareers.in/en/course-detail/niit-161/self-presentation 	

Part D- Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Internal Assessment: No Internal Assessment	Class Test Assignment/Presentation	Nil
External Assessment: University Exam Section: Time : 02:00 Hours	Section (A): Objective Type Questions - 5x2	10 Marks
	Section (B) : Short Questions (200 Words Each) - 3x10	30 Marks
	Section (C) : Long Questions (500 Words Each) - 3x20	60 Marks
Any remarks/suggestions:		


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1. Objectives:

- 1) To develop an appreciation of rural culture, lifestyle and wisdom amongst students
- 2) To learn about the status of various agricultural and development programmes
- 3) To understand causes for distress and poverty faced by vulnerable households and explore solutions for the same
- 4) To apply classroom knowledge of courses to field realities and thereby improve quality of learning.

2. Learning Outcomes: On completion of Community Engagement Programme Courses, students will be able to:

1. Gain an understanding of rural life, Indian culture & ethos and social realities
2. Develop a sense of empathy and bonds of mutuality with local community
3. Appreciate significant contributions of local communities to Indian society and
4. Learn to value the local knowledge and wisdom of the community
5. Identify opportunities for contributing to community's socio-economic Improvements

3. Framework of Community Engagement Programme:

- 1) The course shall be compulsory for academic programmes across faculty and disciplines in the college. It shall be incorporated in the course structure as per the decision of the academic dean of the discipline and subject to approval by the Academic Council of the college.
- 2) Participation of students in CEP shall earn those credits. Community engagement shall be included to meet their graduation requirements, and it shall be integrated into their evaluation.
- 3) In order to sustain regular community engagement programmes, HEIs should develop gradual and long-term linkages with local institutions around them. These include local governments, district administration, local entrepreneurs, business and local NGOs.

Credit structure

- 1) Community Engagement Programme shall be for 2 credits, i.e. 45 hours. 1 credit shall be reserved for Classroom (15 hours) and 1 credit (30 hours) for Field Engagement. It shall be compulsory for all students.

Course Contents

- 1) Contents shall vary faculty-wise and shall be decided by the BoS of each department and approved in the Academic Council of the college.
- 2) Field involvement is a mandatory part of CEP. The content of field involvement shall be decided by the BoS.

4. UGC Recommended field-based activities:

- 1) Interaction with Self Help Groups (SHGs) women members, and study their functions and challenges; planning for their skill-building and livelihood activities;
- 2) Visit Mahatma Gandhi National Rural Employment Guarantee Act 2005 (MGNREGS) project sites, interact with beneficiaries and interview functionaries at the work site;
- 3) Field visit to Swachh Bharat project sites, conduct analysis and initiate problem solving measures;
- 4) Conduct Mission Antyodaya surveys to support under Gram Panchayat Development Plan (GPDP);
- 5) Interactive community exercise with local leaders, panchayat functionaries, grass-root officials and local institutions regarding village development plan preparation and resource mobilization;
- 6) Visit Rural Schools/mid-day meal centres, study academic and infrastructural resources, digital divide and gaps;
- 7) Participate in Gram Sabha meetings, and study community participation;
- 8) Associate with Social audit exercises at the Gram Panchayat level, and interact with programme beneficiaries;
- 9) Visit to local Nagarpalika office and review schemes for urban informal workers and migrants;
- 10) Attend Parent Teacher Association meetings, and interview school drop outs;
- 11) Visit local Anganwadi Centre and observe the services being provided;
- 12) Visit local NGOs, civil society organisations and interact with their staff and beneficiaries;
- 13) Organize awareness programmes, health camps, Disability camps and cleanliness camps;
- 14) Conduct soil health test, drinking water analysis, energy use and fuel efficiency surveys and building solar powered village;
- 15) Raise understanding of people's impacts of climate change, building up community's disaster preparedness;
- 16) Organise orientation programmes for farmers regarding organic cultivation, rational use of irrigation and fertilizers, promotion of traditional species of crops and plants and awareness against stubble burning;

- 17) Formation of committees for common property resource management, village pond maintenance and fishing;
- 18) Identifying the small business ideas (handloom, handicraft, khadi, food products, etc.) for rural areas to make the people self-reliant.
- 19) Any other Community engagement activity with approval of BOS and Academic Council.

5. Evaluation

- 1) The students shall submit a report of their community engagement at the end of the course, individually or in a group.
- 2) The departments shall assess students at the departmental level on the basis of reports and/or the level and skill of engagement by each student. The departments shall submit marks to the Examination Centre.

The evaluation structure will be as follows:

Sr. No.	Parameters	Marks distribution
		UG students (2 credit course) for 50 Marks
1	Problem finding	5
2	data collection	5
3	implementing solutions to actual problems	20
4	Quality and effectiveness of presentation	10
5	CEP Report	10
Total marks		50

6. Conclusion

Incorporation of the **Community Engagement Programme** in the curriculum of BCA disciplines expands the involvement of students in community activities beyond Social Science departments. It connects them with the marginalised communities. The course also develops research aptitudes among students.

PART A: Introduction			
Program: Certificate		Class: B.C.A.	Year: I Year
Session: 2021-22			
Subject: Computer Applications			
1.	Course Code	BCA-107	
2.	Course Title	Computer Architecture (Practical)	
3.	Course Type (Core Course/DSE/Minor/MD-ID/SEC/VOC)	Major - 1 (Core Course)	
4.	Pre-Requisite (if any)	Nil	
5.	Course Learning Outcomes(CLO)	<p>After the completion of this course, a successful student will be able to do the following:</p> <ol style="list-style-type: none"> 1. Realization of the basic logic and universal gates. 2. Verify the behavior of logic gates using truth tables. 3. Implement Binary-to -Gray, Gray-to -Binary code conversions. 4. Design half and full adder circuit using basic gates. 5. Design and construct flip flops and verify the excitation tables. 	
6.	Credit Value	Practical - 2 Credits	
7.	Total Marks	Max. Marks: 100	Min. Passing Marks: 35

PART B: Content of the Course		
No. of Lab. Practical's (in hours per week): 1 Hrs. per week		
Total No. of Labs: 30 Hrs.		
	Suggestive list of Practical's	No. of Labs.
	<ol style="list-style-type: none"> 1. Verification and interpretation of truth table for AND, OR, NOT gates 2. Verification and interpretation of truth table for NAND, NOR gates 3. Verification and interpretation of truth table for Ex-OR, Ex-NOR gates 4. Study of half adder using XOR and NAND gates and verification of its operation 5. Study of full adder using XOR and NAND gates and verification of its operation 6. Study of half subtractor and verification of its operation 7. Study of full subtractor and verification of its operation 8. Realization of logic functions with the help of NAND -Universal Gates 	30 Hrs.



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	<p>9. Realization of logic functions with the help of NOR -Universal Gates</p> <p>10. Verify the truth table of RS flip-flops using NAND and NOR gates</p> <p>11. Verify the truth table of JK flip-flops using NAND and NOR gates</p> <p>12. Verify the truth table of T and D flip-flops using NAND and NOR gates</p> <p>13. Implementation of 4x1 multiplexer using logic gates</p> <p>14. Implementation of 1x4 demultiplexer using logic gates</p> <p>15. Verify Gray to Binary conversion using NAND gates only</p> <p>16. Verify Gray to Binary conversion using NAND gates only</p>	
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PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings

Textbooks:

1. Gerard G. Emch, R. Sridharan, M. D. Srinivas: Contributions to the History of Indian Mathematics, Hindustan Book Agency, Vol. 3, 2005.
2. Udayan S. Patankar & Sunil M. Patankar: Elements of Vedic Mathematics, TTU Press, Tallinn 2018.
3. M. Morris Mano: “Computer System Architecture”, PHI.
4. Heuring Jordan: “Computer System Design & Architecture” (A.W.L.).
5. Donald P Leach, Albert Paul Malvino, Goutam Saha: “Digital Principles & Applications”, Tata McGraw Hill Education Private Limited, 2011 Edition.
6. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें।

Reference Books:

1. William Stalling, “Computer Organization & Architecture”, Pearson Education Asia.
2. V. Carl Hamacher , “Computer Organization”, TMH
3. Tannenbaum, “Structured Computer Organization”, PHI.
4. Er. Rajiv Chopra, “Computer Architecture”, Revised 3rd Edition, S. Chand & Company Pvt. Ltd

Suggested Digital Platforms Web links:

<https://epgp.inflibnet.ac.in>

<https://www.eshiksha.mp.gov.in/mpdhe>

Suggested equivalent online courses

<https://nptel.ac.in/courses/106/105/106105163/>

<https://nptel.ac.in/courses/106/106/106106166/>

<https://nptel.ac.in/courses/106/106/106106134/>



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PART D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Internal Assessment	Marks	External Assessment	Marks
Class Interaction/Quiz		Viva voce practical	
Attendance		Practical record file	
Assignments (Charts/ Model/Seminar/Rural Services/ Technology Dissemination/Report of Excursion/Lab visit/ Survey/Industrial Visit)		Table work/Experiment	
Total	30		70



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Department of Higher Education, Madhya Pradesh
Information Technology-BCA-108

Practicals		
No. of Labs (in hours per week): 2 Hrs.per week		
Credit 1		
Total No. of Labs : 30 Hrs.		
Module	Reference/Suggestive List of Practical Faculty is free to introduce innovative assignments as per student level	No. of Labs
	<ol style="list-style-type: none"> 1. Identify and List Computer System Components Open a PC, identify hardware parts (RAM, HDD, motherboard, I/O devices), and create a labelled diagram. 2. Install and Compare OS (Windows vs Linux) Dual-boot or virtual install Linux (Ubuntu), compare file systems, UI, and commands. 3. File Management Operations Create folders, copy/move/delete files, use command-line (Windows CMD or Linux terminal). 4. Number System Converter Using Spreadsheet Convert between Decimal, Binary, Octal, and Hexadecimal. 5. Explore Digital India Portals Navigate portals like <i>UMANG</i>, <i>MyGov</i>, or <i>eDistrict</i> and note their services. 6. Create a Document with Word Processor Prepare a report with headings, bullet points, image insertion, and page formatting. 7. Use Spreadsheets for Budget/Attendance Calculation Formulas, charts, conditional formatting, and data filtering. 8. Prepare a Presentation with Animations Slides with images, transitions, and speaker notes (topic: e-Governance or AI in India). 9. Type a Paragraph in Hindi or Your Local Language Using Google Input Tools or Indic Keyboard with Unicode support. 10. Translate a Passage Using Google Translate Translate English to any Indian language, check accuracy, and voice pronunciation. 11. Practice Email Writing & IT Vocabulary Compose a formal IT-related email; identify 20 IT-specific terms. 12. Test Voice-to-Text Using Google Lens or ChatGPT Speak a paragraph and convert it to digital text. Analyze accuracy and limitations. 13. QR Code Scanner & UPI Demo (Mock Activity) Generate a QR code using a tool, and simulate UPI-based payments (no real transactions). 14. Create and Share a Document Using Google Workspace Collaborate on Google Docs or Sheets with comments and version history. 15. Visit CERT-IN and Cybercrime Portals Explore the Government's cybercrime reporting portal and note key features. 16. Hands-on with AI Tools (ChatGPT, Gemini, etc.) Ask an AI to generate a bio, convert text to summary, or translate content. Document outputs. 17. Capture an image, audio, and video using a smartphone or digital camera. 	

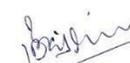
Department of Higher Education, Madhya Pradesh
Information Technology

	<p>Save each file in multiple formats (e.g., JPEG, PNG, WAV, MP3, MP4) and record file sizes. Compare quality and size across formats to understand storage and compression.</p> <p>18. Record audio and video clips and compress them using Audacity and Hand Brake tools. Analyze quality differences and calculate compression ratios.</p> <p>19. Draw a Flowchart for a Real-Life Task E.g., Making tea, submitting an online form.</p> <p>20. Daily Yoga Routine for Digital Wellness Follow a 15-min yoga/stretch session for posture & stress relief. Log benefits weekly.</p>	
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PART D : Assessment and Evaluation

Internal Assessment : Continuous Comprehensive Evaluation (CCE):		End Term Examination(s) : Time :	
Class Test	Marks		
Presentation/Assignment/Quiz/Group Discussion	Marks		
Appropriate weight age of attendance in the class	Marks		
Total	Marks	Total: 100	Marks
Any Remarks/ Suggestions:			

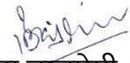
PART A: Introduction			
Program: Certificate Course	Class : B.A./B.Sc./B.Com.	Year: 1st Year	Session : 2025 – 26
Subject: Personality Development			
1.	Course Code	BCA-109	
2.	Course Title	Personality Development (Practical)	
3.	Course Type	Skill Enhancement Course	
4.	Pre-Requisite	Open for all	
5.	Course Learning Outcomes (CLO)	<p>By the end of this course, learners will be able to:</p> <ol style="list-style-type: none"> 1. Demonstrate improved self-awareness and self-confidence through structured activities and reflective practices. 2. Apply effective communication skills—including verbal, non-verbal, and written forms—in academic and professional contexts. 3. Exhibit positive body language, stage presence, and voice modulation in public speaking or group interaction scenarios. 4. Collaborate effectively in team settings, showing empathy, leadership, and interpersonal sensitivity. 5. Set personal and professional goals, and implement techniques for self-motivation, time management, and self-discipline. 6. Identify and overcome common personal development barriers, such as fear of failure, negative self-image, and lack of confidence. 	
6.	Credit Value	2 Credits	
7.	Total Marks	Max. Marks: 100	Min. Passing Marks: 35
PART B : Content of the Course (Practicals)			
Total No. of Practical: 60 Hrs., L – T – P : 0 – 0 – 2			
Unit	Topics		No. of Hrs.


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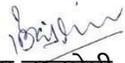
I	<ol style="list-style-type: none"> 1. To conduct a survey of a nearby Anganwadi, Government School, Primary Health Centre and submit a report. 2. Prepare your family genealogical tree and write a report on your family traditions. 3. Conduct an educational visit to a nearby Non Governmental Organization, Old Age Home, Charitable Hospital, Orphanage, Women Police Station etc. Observe its functioning and prepare a report. 4. Prepare a fact based write-up on an inspiring incident of any one great personality i.e. Swami Vivekanand, Mahatma Gandhi, Vinoba Bhave, A. P. J. Abdul Kalam, Ahilya Bai Holkar, Tanya Bheel, Lata Mangeshkar) 5. Compose a human value-based story that includes meaningful conversations. 6. Educational field visit to local place of historical significance and make a presentation. 	60
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Part C-Learning Resources	
Text Books, Reference Books, Other Resources	
<ol style="list-style-type: none"> 1. Andrews, Sudhir (1988). How to Succeed at Interviews. 21st (rep.) Tata McGraw-Hill, New Delhi. 2. Covey, Stephen. (1989). The 7 Habits of Highly Effective People. NY: Free Press 3. Hindle, Tim (2003). Reducing Stress. Essential Manager series. Dk Publishing. 4. Lucas, Stephen (2001). Art of Public Speaking. Tata - Mc-Graw Hill, New Delhi. 5. माडडन, स्टीट, "व्यक्ततत्त्िका विकास", आनंद पेपरबैतस। 6. Petes S. J., Francis (2011). Soft Skills and Professional Communication. Tata McGraw-Hill Education, New Delhi 7. शमाड, पी. के., (2014) "व्यक्ततत्त्िका विकास", भारतीश्री प्रकाशन। 8. Smith, B. (2004). Body Language. Rohan Book Company, Delhi. 	

Part D – Assessment and Evaluation			
Suggested Continuous Evaluation Methods :			
Internal Assessment (Any 2)	Marks	External Assessment	Marks
Assignments (Charts/Model Seminar / Rural Service/	50+50	Viva Voce on Practical	10+10
		Practical Record File	15+15


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Technology Dissemination/ Report of Excursion / Lab Visits/Survey / Industrial visit)		Table work / Experiments	25+25
Total	100		100
Project/Field trip:- As per Requirement of Syllabus.			


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PRESTIGE
INSTITUTE OF MANAGEMENT & RESEARCH, GWALIOR
AN AUTONOMOUS INSTITUTE ACCREDITED WITH UGC NAAC GRADE 'A'

BCA Second Semester
Course Curriculum
2025-26

PART A: Introduction			
Program: Certificate	Class: B.C.A.	Year: I Year	Session: 2025-26
Subject: Computer Applications			
1.	Course Code	Bca-201	
2.	Course Title	Programming Methodology (Theory)	
3.	Course Type (Core Course/DSE/Minor/MD-ID/SEC/VOC)	Major – II (Core Course)	
4.	Pre-Requisite (if any)	To study this course, a student must have basic knowledge of Computers.	
5.	Course Learning Outcomes (CLO)	After the completion of this course, a successful student will be able to do the following: <ol style="list-style-type: none"> 1. Develop simple algorithms and flow charts to solve a problem with programming using top down design principles. 2. Writing efficient and well-structured computer algorithms/programs. 3. Learn to formulate iterative solutions and array processing algorithms for problems. 4. Use recursive techniques, pointers and searching methods in programming. 	
6.	Credit Value	Theory – 4 Credits	
7.	Total Marks	Max. Marks : 30 + 70	Min. Passing Marks: 35

PART B: Content of the Course		
No. of Lectures (in hours per week): 2 Hrs. per week		
Total No. of Lectures: 60 Hrs.		
Module	Topics	No. of Lectures
I	Indian Knowledge System: Ancient Indian Contribution: Brahmagupta "Chakravala method", Aryabhata Algorithm. The Panini Grammar System (Ashtadhyayi). Modern Contribution: Origin of Julia Programming Language, Indian Scientist who designed new programming languages and open source languages. Suggested Activities: Discuss how Panini's grammar rules resemble formal grammar in programming languages, Aryabhata Algorithm.	02



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II	<p>Introduction to Programming - Program Concept, Characteristics of Programming, Stages in Program Development, Algorithms, Notations, Design, Flowcharts, Types of Programming Methodologies.</p> <p>Basics of C++: A Brief History of C++, Application of C++, Compiling & Linking, Tokens, Keywords, Identifiers & Constants , Basic Data Types, User-Defined Data Types, Symbolic Constant, Type Compatibility, Reference Variables, Operator in C++, Scope Resolution Operator, Member Dereferencing Operators, Memory Management Operators, Manipulators, Type Cast Operator.</p> <p>Conditional Statements if construct, switch-case construct.</p> <p>Iterative Statements: while, do-while, and for loops, use of break and continue in loops, Using Nested Statements (Conditional as well as Iterative).</p> <p><i>Suggested Activities: Implement a console-based quiz using formatted I/O, Use flowcharts and pseudocode tools to map variable types and memory usage.</i></p>	12
III	<p>Functions In C++: The Main Function, Function Prototyping, Call by Reference Call by Address, Call by Value, Return by Reference, Inline Function, Default Arguments, Constant Arguments, Function Overloading, Function with Array.</p>	10
IV	<p>Classes & Objects: A Sample C++ Program with class, Defining Member Functions, Making an Outside Function Inline, Nesting of Member Functions, Private Member Functions, Arrays within a Class, Memory Allocation for Objects, Static Data Members, Static Member, Functions, Array of Objects, Object as Function Arguments, Friend Functions, Virtual functions, Returning Objects, Constant member functions, Pointer to Members, Local Classes.</p> <p><i>Suggested Activities: Combine all the modules to create a comprehensive Library Management System with features like adding books, managing users, calculating late fees, and tracking library statistics. Design a Simple Banking System in C++.</i></p>	12
V	<p>Constructor & Destructor: Constructor, Parameterized Constructor, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructor and Destructor.</p> <p>Inheritance: Defining Derived Classes, Single Inheritance, Making a Private Member Inheritable, Multilevel Inheritance, Hierarchical Inheritance, Multiple Inheritance, Hybrid Inheritance.</p>	12



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	Suggested Activities: Building a Simple Student Management System, Designing a Vehicle Management System. Implement dynamic memory allocation for managing multiple vehicles.	
VI	Various types of Classes: Virtual Base Classes, Abstract Classes, Constructor in Derived Classes, Nesting of Classes. Operator Overloading & Type Conversion, Polymorphism. Pointers: Pointers with Arrays C++. Streams: C++ Stream Classes, Unformatted I/O Operation, Formatted I/O Operation, Managing Output with Manipulators, Exception Handling.	12
	Suggested Activities: Create a Shape Management System to manage different geometric shapes like Circle, Rectangle, and Triangle. Develop a Payroll System for managing employee salaries.	

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings:

Textbooks:

1. Gerard G. Emch, R. Sridharan, M. D. Srinivas: Contributions to the History of Indian Mathematics, Hindustan Book Agency, Vol. 3, 2005.
2. Udayan S. Patankar & Sunil M. Patankar: Elements of Vedic Mathematics, TTU Press, Tallinn 2018.
3. J. R. Hanly and E. B. Koffman, "Problem Solving and Program Design in C", Pearson, 2015.
4. E. Balguruswamy, "C++ ", TMH Publication ISBN O-07-462038-X
5. Herbert Schildt, "C++ The Complete Reference "TMH Publication ISBN 0-07-463880-7.
6. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें।

Reference Books:

1. R. Lafore, 'Object Oriented Programming C++'
2. N. Dale and C. Weems, "Programming and problem solving with C++: brief edition", Jones & Bartlett Learning.

Suggestive Digital Platform Web Links:

<https://www.eshiksha.mp.gov.in/mpdhe>

Suggested Equivalent Online Courses:

<https://nptel.ac.in/courses/106/105/106105151/>

<https://nptel.ac.in/courses/106/105/106105234/>



Prof. (Dr.) Umesh Kumar Singh
Dean, Faculty of Engineering Sciences,
Vikram University, Ujjain (MP)

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: **100**
Continuous Comprehensive Evaluation (CCE): **30** Marks
University Exam (UE): **70** Marks

Internal Assessment:

Continuous Comprehensive Evaluation (CCE)

Total Marks: 30

External Assessment:

University Exam Section
Time: 03.00 Hours

Section (A) : Very Short Questions

Section (B) : Short Questions

Section (C) : Long Questions

Total Marks: 70



Prof. (Dr.) Umesh Kumar Singh
Dean, Faculty of Engineering Sciences,
Vikram University, Ujjain (MP)

PART A: Introduction			
Program: Certificate		Class: B.C.A.	Year: I Year
Session: 2025-26			
Subject: Computer Applications			
1.	Course Code	BCA-202	
2.	Course Title	Data Structures (Theory)	
3.	Course Type (Core Course/DSE/Minor/MD-ID/ SEC/VOC)	Major – III (Core Course)	
4.	Pre-Requisite (if any)	To study this course, a student must have basic knowledge of Computers.	
5.	Course Learning Outcomes (CLO)	After the completion of this course, a successful student will be able to do the following: <ol style="list-style-type: none"> 1. Will be familiar with fundamental data structures, their implementation; become accustomed to the description of algorithms in both functional and procedural styles. 2. Have knowledge of complexity of basic operations like insert, delete, search on these data structures. 3. Possess ability to choose a data structure to suitably model any data used in computer applications. 4. Design programs using various data structures including hash tables, Binary and general search trees, heaps, graphs etc. 5. Assess efficiency tradeoffs among different data structure implementations. 6. Implement and know the applications of algorithms for searching and sorting. 7. Know the contributions of Indians in the field of programming and data structures. 	
6.	Credit Value	Theory – 4 Credits	
7.	Total Marks	Max. Marks : 30 + 70	Min. Passing Marks: 35

PART B: Content of the Course		
No. of Lectures (in hours per week): 2 Hrs. per week		
Total No. of Lectures: 60 Hrs.		
Module	Topics	No. of Lectures
I	Indian Knowledge System: Resemblance of efficient Sorting & Searching techniques with Ancient Indian classification methods in Ayurveda & Sanskrit texts. The Buddhist Numerical Sorting Method (Bhāskara II). Indian	02



Prof. (Dr.) Umesh Kumar Singh
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	contribution in Data Structure: Dr. Sartaj Sahni, Dr. Arvind, R. K. Gupta.	
	Suggested Activities: <i>Vedic Sorting Implementation: Develop a sorting algorithm inspired by Ayurvedic classification techniques. Study the resemblance of temple architecture to graph connectivity and model it using Graphviz/Network..</i>	
II	<p>Data Structure: Basic concepts, Linear and Non-Linear data structures</p> <p>Algorithm Specification: Introduction, Recursive algorithms, Data Abstraction, Performance analysis.</p> <p>Arrays: Representation of single, two-dimensional arrays, triangular arrays, sparse matrices-array and linked representations.</p> <p>Suggested Activities: <i>Implementing a Simple To-Do List using Linear Data Structures, Exploring Non-Linear Data Structures with a Family Tree, Sparse Matrix Operations Using Arrays.</i></p>	10
III	<p>Stacks: Operations, Array and Linked Implementations, Applications- Infix to Postfix Conversion, Infix to Prefix Conversion, Postfix Expression Evaluation, Recursion Implementation.</p> <p>Queues: Definition, Operations, Array and Linked Implementations. Circular Queue-Insertion and Deletion Operations, Dequeue (Double Ended Queue), Priority Queue- Implementation.</p> <p>Linked Lists: Singly Linked Lists, Operations, Concatenating, circularly linked lists-Operations for Circularly linked lists, Doubly Linked Lists-Operations, Doubly Circular Linked List, Header Linked List.</p> <p>Suggested Activities: <i>Express Calculator Using Stacks, Queue Simulation for a Bank System, Linked List-Based Music Playlist, Compare linked list pointer-based structure with ancient manuscript referencing, Develop a queue system (FIFO) for handling real-world ticket processing.</i></p>	14
IV	<p>Trees: Representation of Trees, Binary tree, Properties of Binary Trees, Binary Tree Representations- Array and Linked Representations, Binary Tree Traversals, Threaded Binary Trees.</p> <p>Heap: Definition, Insertion, Deletion.</p> <p>Suggested Activities: <i>Create efficient storage models for Ayurveda medicinal records using tree-based structures. Research how Vedic knowledge management compares with modern database indexing, Implement tree traversal to simulate genealogy in Vedic lineage texts, Implement heap sorting for priority based Ayurveda classification.</i></p>	12
V	<p>Graphs: Graph ADT, Graph Representations, Graph Traversals, Searching.</p> <p>Hashing: Introduction, Hash tables, Hash functions, Overflow Handling.</p>	10



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Vikram University, Ujjain (MP)

	Suggested Activities: Model Indian temple network connectivity using graph algorithms, Social Network Graph Simulation, Implementing a Hash Map, Graph-Based Maze Solver.	
VI	Sorting: Bubble Sort, Selection Sort, Insertion Sort, Quick Sort, Merge Sort, Comparison of Sorting Methods, Search Trees: Binary Search Trees, AVL Trees- Definition and Examples. Suggested Activities: Students compete to optimize sorting algorithms based on Ayurvedic classification techniques, Use binary trees to model ancient Indian lineage systems.	12

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings:

Textbooks:

1. Gerard G. Emch, R. Sridharan, M. D. Srinivas: Contributions to the History of Indian Mathematics, Hindustan Book Agency, Vol. 3, 2005.
2. Udayan S. Patankar & Sunil M. Patankar: Elements of Vedic Mathematics, TTU Press, Tallinn 2018.
3. Sartaj Sahani, "Data Structures, Algorithms and Applications with C++", McGraw Hill.
4. Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.
5. D. S. Malik, "Data Structure using C++", Second edition, Cengage Learning.
6. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें।

Reference Books:

1. Adam Drozdek, "Data Structures and algorithm in C++", Third Edition, Cengage Learning.
2. M. A. Weiss, "Data structures and Algorithm Analysis in C", 2nd edition, Pearson.
3. Lipschutz, "Schaum's outline series Data structures", Tata McGraw-Hill.

Suggestive Digital Platform Web Links:

<https://www.eshiksha.mp.gov.in/mpdhe>

<https://epgp.inflibnet.ac.in>

Suggested Equivalent Online Courses:

<https://nptel.ac.in/courses/106/102/106102064/>

<https://nptel.ac.in/courses/106/106/106106127/>

<https://nptel.ac.in/courses/106/105/106105085/>



Prof. (Dr.) Umesh Kumar Singh
Dean, Faculty of Engineering Sciences,
Vikram University, Ujjain (MP)

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: **100**
Continuous Comprehensive Evaluation (CCE): **30** Marks
University Exam (UE): **70** Marks

Internal Assessment:

Continuous Comprehensive Evaluation (CCE)

Total Marks: 30

External Assessment:

University Exam Section

Time: 03.00 Hours

Section (A) : Very Short Questions

Section (B) : Short Questions

Section (C) : Long Questions

Total Marks: 70



Prof. (Dr.) Umesh Kumar Singh
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Vikram University, Ujjain (MP)

Part A Introduction		
Program: Degree		Class: B.COM I Year
Subject: Commerce		Session: 2025-2026
1	Course Code	BCA-203
2	Course Title	Business Organization and Communication
3	Course Type	Minor -II
4	Pre-requisite (if any)	Not required) open for all
5	Course Learning outcomes (CLO)	<p>Upon successful completion of this course, the student will be able to:</p> <ul style="list-style-type: none"> Understand the scope of Business, and its importance. Explain business ethics as an integral part of every business organization Identify different forms of business organizations viz; Sole Proprietorship, Partnership, Joint Hindu Family Business & Co-operative Organizations. The chapters related communication shall be able to elucidate how communication plays an important role in modern business scenario. To demonstrate his/her ability to write error free while making an optimum use of correct Business Vocabulary & Grammar. To draft effective business correspondence with brevity and clarity.
6	Credit Value	4
7	Total Marks	Max. Marks: 30 +70 Min. Passing Marks: 35

Part B- Content of the Course

Total No. of Lectures- 60

Unit	Topics	No. of Lectures
1	<p>Indian ancient business system, commercial nature and economic institutions, major traditional industries, trade and business routes.</p> <p>Business organization: concept, characteristics and purpose. Business functions and social obligations. Necessary steps for newness.</p> <p>Activity- Community Service: Sending students to work in different parts of society, such as environmental protection, education, healthcare, etc. This will provide them with social responsibility and leadership experience.</p>	10
2	<p>FORMS OF BUSINESS ORGANIZATION: Business Organization - Classification - Factors Influencing the Choice of Suitable Form of Organization - Sole Proprietorship and Partnership – Meaning, Definition - Characteristics - Advantages. Co-Operative Organization – Meaning, Functions and Limitations of Co-operatives Societies.</p> <p>Activity - Roll Play - Mock Interview - Office meeting and presentation - copy of conversation between client and company.</p>	10
3	<p>ORGANIZATION OF COMPANIES: Concepts, Meaning, Formation, Characteristics and Significance of Private Company and Public Company.</p>	10

Amisdo

	<p>Multinational Companies (MNC'S) and the Challenges of their organization in India.</p> <p>Activity - Event Management: To hand over the task of playing a role in the programs organized by the institute or any other organization. This will improve their organizational and leadership capacity.</p>	
4	<p>COMMUNICATION: Various means of communication in Indian knowledge system, communication-Definition, Nature, Importance, , Nyaya (Logic and Debate Skills), Kinds of Communication Mudras & Body Language, Communication theories and process- Information theory, Interaction theory, Transaction theory, Elements of communication process. Barriers to Communication:</p> <p>Activity -Speech and Public Speaking -To give speeches on various forums, give an opportunity to participate in debate and discussion sessions, which will increase their confidence and dialogue skills.</p>	10
5	<p>Written Communication: Writing techniques and Guidelines. Letter writing – Basic Principles, Purpose, Types of business letters, Report writing, types of reports, Drafting of report. Oral Communication: Speeches for different occasions, Guidelines for effective listening, Job Interviews, Type of information.</p> <p>Activity - Interviews and Instructions - To conduct interviews to explore career opportunities or give a chance to give a presentation on professional subjects to explore career opportunities.</p>	10
6	<p>Modern forms of communication E-mail, Video Conferencing, International Communication for Global Business. Information Technology: Form of technology, uses in modern communication system. Role of social media in modern business.</p> <p>Activity -Case Study Analysis:</p>	10

(PROF.PAVAN MISHRA)

Chairman

Central Board of Studies (Commerce)
Department of Higher Education Govt. of M.P.

Part C-Learning Resources		
Text Books, Reference Books, Other resources		
1.T.N. Chhabra, Business CommunicationHimalaya Publishing House New Delhi		
2 .K.K. Sihna, Essentials of Business CommunicationVK Global publicationsFaridabad		
3.Dr. Ramesh MangalBusiness Communications Universal Publication Agra		
4.Dr. S.C. Saksena Business Organisation and Communication,Sahitya bhawan Agra		
5.Manoj Kumar Garg Business Communication,Kitab Mahal Agra		
Suggestive digital platforms web links:		
1. file:///C:/Users/Admin/Downloads/8281-Article%20Text-29066-1-10-20130630.pdf		
2. https://dceutkal.ac.in/Syllabus/MA_English/Paper_21.pdf		
3. https://drive.google.com/file/d/0B_V4Kkm2koFqTzdxMjBiWGRvOWs/view		
4. http://www.rapodar.ac.in/pdf/elearn/Business%20Communication%20Semester%20I%20notes.pdf		
5. https://phaariz.files.wordpress.com/2009/06/sis-module-summary.pdf		
Suggested equivalent online courses:		


(Dr. Pavan Mishra)

आधार पाठ्यक्रम – प्रथम प्रश्न पत्र – हिन्दी भाषा और संस्कृति

(भाग – अ) परिचय

कार्यक्रम : यूजी लेवल प्रमाण पत्र	कक्षा : बी.ए./बी.कॉम /बी.एस.सी./बी.एच.एससी. /बी.सी.ए/बी.बी.ए. (प्रथम वर्ष)	वर्ष 2025-26
विषय :-	आधार पाठ्यक्रम	
पाठ्यक्रम कोड	BCA-204	
पाठ्यक्रम का शीर्षक : पाठ्यक्रम का प्रकार	हिन्दी भाषा और संस्कृति आधार पाठ्यक्रम	
पाठ्यक्रम अपेक्षित	कक्षा 12 वी उत्तीर्ण किसी भी विषय समूह से प्रमाण पत्र किया हो पात्र है ।	
पाठ्यक्रम अध्ययन की उपलब्धि (लर्निंग आउटकम) CLO	<ol style="list-style-type: none"> 1 – भारतीय ज्ञान परम्परा से विद्यार्थियों को अवगत एवं लाभान्वित करवाना । 2 – इस पाठ्यक्रम के अध्ययन से विद्यार्थी हिन्दी के प्रसिद्ध रचनाकारों एवं उनकी रचनाओं से परिचित हो सकेंगे । 3 – पठित रचनाओं के माध्यम से विद्यार्थी देश की संस्कृति चेतना,संस्कार एवं राष्ट्रीय भावना से परिचित हो सकेंगे 4 – व्याकरण एवं भाषा ज्ञान का बोध । 5 – सामान्य शब्दावली और विशेष शब्दावली के अध्ययन द्वारा भाषा एवं संस्कृति बोध का विकास करना । 6 – विशेष शब्दावली (बीज शब्द / की वर्ड) से परिचित करवाते हुए बोध के स्तर को विकसित करना । 7 – प्रतियोगी परीक्षाओं हेतु तैयार करना । 	
क्रेडिट	02 क्रेडिट	
कुल अंक	50 अंक	
उत्तीर्ण अंक	17 अंक	

Ashaleya
01/04/25
Dr. Pooja Shrivastava
अध्यक्ष

केन्द्रीय अध्ययन मण्डल
(हिन्दी भाषा)
उच्च शिक्षा विभाग म.प्र. शासन

(भाग-ब) कोर्स सामग्री

व्याख्यान की कुल संख्या : वर्ष में अधिकतम 30 घंटे

इकाई	विषय	व्याख्यान की संख्या
इकाई -1	1. भारतीय ज्ञान परम्परा : एक परिचय	6 घंटे
	2. भारतीय ज्ञान परम्परा और हिन्दी भाषा	
	3. आदि शंकराचार्य - जीवन व दर्शन	
इकाई -2	1. मैथिलीशरण गुप्त : परिचय पाठ : मातृभूमि (कविता)	6 घंटे
	2. सूर्यकांत त्रिपाठी 'निराला' : परिचय पाठ : भारत वंदना (कविता)	
	3. प्रेमचन्द : परिचय पाठ : शतरंज के खिलाडी (कहानी)	
इकाई -03	1. वैचारिक - भारतीय भाषाओं में राम	6 घंटे
	2. आचार्य रामचन्द्र शुक्ल : परिचय पाठ : उत्साह (भावमूलक निबन्ध)	
	3. रामधारी सिंह दिनकर : परिचय पाठ : भारत एक है (संस्कृति) लेख	
	4. शरद जोशी : परिचय पाठ :- अफसर (व्यंग्य)	
इकाई -04	हिन्दी व्याकरण	6 घंटे
	1. शब्द रचना : उपसर्ग एवं प्रत्यय	
	2. शब्द प्रकार : तत्सम, तद्भव, देशज , विदेशी , संकर , नव निर्मित शब्द	
इकाई -05	हिन्दी व्याकरण	6 घंटे
	1. हिन्दी के प्रमुख विराम चिह्न	
	2. संक्षेपण 3. वीज शब्द - धर्म , अद्वैत, भाषा, अवधारणा	

Ashalya
01/04/25
Dr. J. P. Singh (21/04/25)

अध्यक्ष
केन्द्रीय अध्ययन मण्डल
(हिन्दी भाषा)
उच्च शिक्षा विभाग म.प्र. शासन

सार बिन्दु (की वर्ड) / टैग		
सर्च करे :		
मैथिलीशरण गुप्त :	मैथिलीशरण गुप्त की कविता- मातृभूमि	
सूर्यकान्त त्रिपाठी निराला: भारत वंदना	सूर्यकान्त त्रिपाठी निराला: भारत वंदना	
प्रेमचन्द	प्रेमचन्द - शतरंज के खिलाडी	
रामधारी सिंह दिनकर	भारत एक है।	
आचार्य रामचन्द्र शुक्ल	उत्साह निबन्ध	
भारतीय ज्ञान परम्परा	भारतीय ज्ञान परम्परा और हिन्दी भाषा	
धर्म क्या है ?		
शब्द रचना, शब्द प्रकार पर्यायवाची शब्द		
विलोम शब्द अनेक शब्द के लिए एक शब्द		
विराम चिह्न		
संक्षेपण		

Ashwani
 01/04/25
 स्. पुष्पा शर्मा
 अध्यक्ष
 केन्द्रीय अध्ययन मण्डल
 (हिन्दी भाषा)
 उच्च शिक्षा विभाग म.प्र. शासन

(भाग - स)	
अनुशंसित अध्ययन संसाधन	
पाठ्य पुस्तके , सन्दर्भ पुस्तके , अन्य संसाधन	
1.	प्रेमचन्द्र - मानसरोवर , खण्ड - 3
2.	आचार्य रामचन्द्र शुक्ल - चिन्तामणि , भाग -1
3.	शरद जोशी - "कहा जाता है " (व्यंग्य संग्रह)
4.	डॉ. वासुदेव नन्दन प्रसाद : आधुनिक हिन्दी व्याकरण और रचना , भारती भवन, ठाकुर बाड़ी रोड़, पटना , बिहार
5.	डॉ. राजेश्वर चतुर्वेदी , हिन्दी व्याकरण - उपकार प्रकाशन , आगरा उ.प्र.
6.	भारतीय ज्ञान परम्परा - विविध आयाम सम्पादक - प्रो. सरोज शर्मा, शिप्रा प्रकाशन - नई दिल्ली
7.	शुक्ल डॉ. स्मृति " भारतीय ज्ञान परम्परा के विविध संदर्भ " (प्रोसिडिंग) उच्च शिक्षा विभाग म.प्र. शासन भोपाल
8.	प्राचीन भारतीय ज्ञान परम्परा लेखक - डॉ. अश्विन कुमार राठौर , प्रकाशक - श्री सौंईनाथ, प्रकाशन- नागपुर
9.	हिन्दी ज्ञान कोश
10.	इन्टरनेट सामग्री - टैग में उल्लेखित

Asha 179
 01/04/25
 डॉ. युष्प 211821
 अध्यक्ष
 केन्द्रीय अध्ययन मण्डल
 (हिन्दी भाषा)
 उच्च शिक्षा विभाग म.प्र. शासन

PART A: Introduction			
Program: Certificate		Class: B.C.A.	Year: I Year
Session: 2025-26			
Subject: Computer Applications			
1.	Course Code	BCA-206	
2.	Course Title	Programming Methodology (Practical)	
3.	Course Type (Core Course/DSE/Minor/MD-ID/SEC/VOC)	Major – II (Core Course)	
4.	Pre-Requisite (if any)	To study this course, a student must have basic knowledge of Computers.	
5.	Course Learning Outcomes (CLO)	After the completion of this course, a successful student will be able to do the following: <ol style="list-style-type: none"> 1. Develop simple algorithms and flow charts to solve a problem with programming using top down design principles. 2. Writing efficient and well-structured computer algorithms/programs. 3. Learn to formulate iterative solutions and array processing algorithms for problems. 4. Use recursive techniques, pointers and searching methods in programming. 	
6.	Credit Value	Practical – 2 Credits	
7.	Total Marks	Max. Marks: 100	Min. Passing Marks: 35

PART B: Content of the Course	
No. of Lab Practicals (in hours per week): 1 hours per week	
Total No. of Lab.: 30 Hrs.	
	Suggestive list of Practical's
	No. of Labs.



Prof. (Dr.) Umesh Kumar Singh
Dean, Faculty of Engineering Sciences,
Vikram University, Ujjain (MP)

<p>Given the problem statement, students are required to formulate problem, develop flowchart/algorithm, write code in C++, execute and test it. Students should be given assignments on following:</p> <ol style="list-style-type: none"> 1. Write a program to swap the contents of two variables. 2. Write a program for finding the roots of a Quadratic Equation. 3. Write a program to find area of a circle, rectangle, square using switch case. 4. Write a program to print table of any number. 5. Write a program to print Fibonacci series. 6. Write a program to find factorial of a given number using recursion. 7. Write a program to convert decimal (integer) number into equivalent binary number. 8. Write a program to check given string is palindrome or not. 9. Write a program to print digits of entered number in reverse order. 10. Write a program to print sum of two matrices. 11. Write a program to print multiplication of two matrices. 12. Write a program to generate even/odd series from 1 to 100. 13. Write a program whether a given number is prime or not. 14. Write a program for call by value and call by reference. 15. Write a program to create a pyramid structure <ul style="list-style-type: none"> 1 12 123 1234 16. Write a program to check entered number is Armstrong or not. 17. Write a program to input N numbers and find their average. 18. Write a program to find the area and volume of a rectangular box using constructor. 19. Write a program to design a class time with hours, minutes and seconds as data members. Use a data function to perform the addition of two time objects in hours, minutes and seconds. 20. Write a program to implement single inheritance. 	<p>30 Hrs.</p>
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PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings:

Textbooks:

1. Gerard G. Emch, R. Sridharan, M. D. Srinivas: Contributions to the History of Indian Mathematics, Hindustan Book Agency, Vol. 3, 2005.



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2. Udayan S. Patankar & Sunil M. Patankar: Elements of Vedic Mathematics, TTU Press, Tallinn 2018.
3. J. R. Hanly and E. B. Koffman, “Problem Solving and Program Design in C”, Pearson, 2015
3. E. Balguruswamy, "C++ ", TMH Publication ISBN O-07-462038-X
4. Herbert Schildt, "C++ The Complete Reference "TMH Publication ISBN 0-07-463880-7.
5. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें।

Reference Books:

1. R. Lafore, 'Object Oriented Programming C++'
2. N. Dale and C. Weems, “Programming and problem solving with C++: brief edition”, Jones & Bartlett Learning.

Suggestive Digital Platform Web Links:

<https://www.eshiksha.mp.gov.in/mpdhe>

Suggested Equivalent Online Courses:

<https://nptel.ac.in/courses/106/105/106105151/>

<https://nptel.ac.in/courses/106/105/106105234/>

PART D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Internal Assessment	Marks	External Assessment	Marks
Class Interaction/Quiz		Viva voce practical	
Attendance		Practical record file	
Assignments (Charts/ Model/Seminar/Rural Services/ Technology Dissemination/Report of Excursion/Lab visit/ Survey/Industrial Visit)		Table work/Experiment	
Total	30		70



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PART A: Introduction			
Program: Certificate		Class: B.C.A.	Year: I Year
Session: 2025-26			
Subject: Computer Applications			
1.	Course Code	BCA-207	
2.	Course Title	Data Structures (Practical)	
3.	Course Type (Core Course/DSE/Minor/MD-ID/SEC/VOC)	Major – III (Core Course)	
4.	Pre-Requisite (if any)	To study this course, a student must have basic knowledge of Computers.	
5.	Course Learning Outcomes (CLO)	<p>After the completion of this course, a successful student will be able to do the following:</p> <ol style="list-style-type: none"> 1. Will be familiar with fundamental data structures, their implementation; become accustomed to the description of algorithms in both functional and procedural styles. 2. Have knowledge of complexity of basic operations like insert, delete, search on these data structures. 3. Possess ability to choose a data structure to suitably model any data used in computer applications. 4. Design programs using various data structures including hash tables, Binary and general search trees, heaps, graphs etc. 5. Assess efficiency tradeoffs among different data structure implementations. 6. Implement and know the applications of algorithms for searching and sorting. 7. Know the contributions of Indians in the field of programming and data structures. 	
6.	Credit Value	Practical – 2 Credits	
7.	Total Marks	Max. Marks: 100	Min. Passing Marks: 35

PART B: Content of the Course	
No. of Lab Practical's (in hours per week): 1 hours per week	
Total No. of Lab.: 30 Hrs.	
	Suggestive list of Practical's
	Given the problem statement, students are required to formulate problem,
	No. of Labs.
	30 Hrs.



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<p>develop flowchart/algorithm, write code in C++, execute and test it. Students should be given assignments on following:</p> <ol style="list-style-type: none"> 1. Write a program to find largest element from an array. 2. Write a program to implement push and pop operations on a stack using array. 3. Write a program to perform insert and delete operations on a queue using array. 4. Write a program for Linear search. 5. Write a program for Binary search. 6. Write a program for Bubble sort. 7. Write a program for Selection sort. 8. Write a program for Quick sort. 9. Write a program for Insertion sort. 10. Write a program to implement linked list. 	
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2. Udayan S. Patankar & Sunil M. Patankar: Elements of Vedic Mathematics, TTU Press, Tallinn 2018.
3. Sartaj Sahani, “Data Structures, Algorithms and Applications with C++”, McGraw Hill.
4. Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.
5. D. S. Malik, “Data Structure using C++”, Second edition, Cengage Learning.
6. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें।

Reference Books:

1. Adam Drozdek, "Data Structures and algorithm in C++", Third Edition, Cengage Learning.
2. M. A. Weiss, “Data structures and Algorithm Analysis in C”, 2nd edition, Pearson.
3. Lipschutz, “Schaum’s outline series Data structures”, Tata McGraw-Hill.

Suggestive Digital Platform Web Links:

<https://www.eshiksha.mp.gov.in/mpdhe>
<https://epgp.inflibnet.ac.in>

Suggested Equivalent Online Courses:

<https://nptel.ac.in/courses/106/102/106102064/>
<https://nptel.ac.in/courses/106/106/106106127/>
<https://nptel.ac.in/courses/106/105/106105085/>



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Internal Assessment	Marks	External Assessment	Marks
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Assignments (Charts/ Model/Seminar/Rural Services/ Technology Dissemination/Report of Excursion/Lab visit/ Survey/Industrial Visit)		Table work/Experiment	
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