Scheme of Examination (Revised under NEP - As per Ordinance 14-A)

CBCS System

Scheme of Examination

&

Syllabus

For

Bachelor of Computer Application

(B.C.A.)

Part I – Semester I & II

SESSION 2022-23

CHRISTIAN EMINENT COLLEGE, INDORE
ACADEMY OF MANAGEMENT, PROFESSIONAL EDUCATION & RESEARCH
An Autonomous Institution Established in 1996
AFFILIATED TO DEVI AHILYA VISHWAVIDYALAYA, INDORE
F-SECTOR, R.S.S. NAGAR, H.I.G. MAIN ROAD, INDORE

CHRISTIAN EMINENT COLLEGE, INDORE

(Academy of Management, Professional Education & Research)

An Autonomous Institution Established in 1996

NAAC (UGC) Accredited WITH GRADE "A"

F-Sector, H.I.G., Ravi Shankar Shukla Nagar Main Road, Indore (M.P.) – 452011

2022-23

Scheme of Examination (Revised under NEP - As per Ordinance 14-A)

B.C.A. Part I – Semester I

COURSE TYPE	COURSE NAME	COURSE CODE	COURSE TITLE	CREDITS	TOTAL HOURS	LECTURE HOURS PER WEEK	MIN. GRADE POINT OUT OF 10
MAJOR	Computer Application	**BCA – T 101**	Computer System Architecture	04	60	04	04
		BCA – P 101	Practical on CSA	02	60	08	04
MINOR	Computer Application	**BCA – T 102**	Operating System	04	60	04	04
		BCA – P 102	Practical on OS	02	60	08	04
GENRIC ELECTIVE ANY ONE	**BCA – T/P 103**						
	Commerce	NPGE-P109	Fundamental of Accounting -I	04	60	04	04
	Mathematics	NPGE-T110	Matrices, Geometry and Vector Algebra-I	04	60	04	04
	Computer Application	NPGE-T111	MS Office-I	03	45	03	04
		NPGE-P111	Practical on MS office-I	01	30	02	04
	Physics	NPGE-T112	Non-Conventional Energy Source-I	04	60	04	04
		NPGE-P112	Practical on NCES-I	01	30	02	04
ABILITY ENHANCEMENT	**BCA – T 105**						
		NPAE-T101	Bhasha aur Snaskrati	02	30	02	04
		NPAE-T102	Environmental Education	02	30	02	04
TOTAL				**20**			

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2022-23

Scheme of Examination (Revised under NEP - As per Ordinance 14-A)

BCA Part I – Semester I

Course Name	Course Code	Max. Marks					Min. Marks			
		Theory Examination		Practical Examination		TOTAL MARKS	Theory Exam.		Practical Marks	
		External	Internal	External	Internal		External	Internal	External	Internal
MAJOR COURSES (ANY ONE) TYPE 2 - CREDIT 06 (04+02)										
Computer Application	BCA – T 101	60	40	-	-		21	14	-	-
Practical on CA	BCA – P 101	-	-	60	40		-	-	21	14
MINOR COURSES (ANY ONE) TYPE 2 - CREDIT 06 (04+02)										
Computer Application	BCA – T 102	60	40	-	-		21	14	-	-
Practical on CA	BCA – P 102	-	-	60	40		-	-	21	14
GENRIC ELECTIVE COURSES (ANY ONE) TYPE 1 - CREDIT 04 (04+00)										
Commerce	NPGE-T109	60	40	-	-		21	14	-	-
Mathematics	NPGE-T110	60	40	-	-		21	14	-	-
GENRIC ELECTIVE COURSES (ANY ONE) TYPE 2 - CREDIT 04 (03+01)										
Computer Application	NPGE-T111	60	40	-	-		21	14	-	-
Practical on CA	NPGE-P111	-	-	100	-		-	-	35	-
Physics	NPGE-T112	60	40	-	-		21	14	-	-
Practical on PHY	NPGE-P112	-	-	100	-		-	-	35	-
ABILITY ENHANCEMENT - CREDIT 04 (04+00)										
Hindi Language – Bhasha aur Snaskrati	NPAE-T101	30	20	-	-		11	7	-	-
Environmental Education	NPAE-T102	30	20	-	-		11	7	-	-
TYPE 1 - 03 Theory										
TOTAL MARKS		400		-			200		-	
TYPE 2 - 02 Theory + 01 Theory + Practical										
TOTAL MARKS		500		-			250		-	
TYPE 3 - 01 Theory + 02 Theory + Practical										
TOTAL MARKS		600		-			300		-	
TYPE 4 - 03 Theory + Practical										
TOTAL MARKS		700		-			350		-	

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2022-23

Scheme of Examination (Revised under NEP - As per Ordinance 14-A)

B.C.A. Part I – Semester II

COURSE TYPE	COURSE NAME	COURSE CODE	COURSE TITLE	CREDITS	TOTAL HOURS	LECTURE HOURS PER WEEK	MIN. GRADE POINT OUT OF 10
MAJOR	Computer Application	BCA – T 201	Programming Methodology & Data Structures	04	60	04	04
		BCA – P 201	Practical on CSA	02	60	08	04
MINOR	Computer Application	BCA – T 202	Operating System-II	04	60	04	04
		BCA – P 202	Practical on OS	02	60	08	04
GENRIC ELECTIVE ANY ONE	**BCA – T/P 203**						
	Commerce	NPGE-P209	Fundamental of Accounting -II	04	60	04	04
	Mathematics	NPGE-T210	Matrices, Geometry and Vector Algebra-II	04	60	04	04
	Computer Application	NPGE-T211	MS Office-II	03	45	03	04
		NPGE-P211	Practical on MS office-II	01	30	02	04
	Physics	NPGE-T212	Non-Conventional Energy Source-II	04	60	04	04
		NPGE-P212	Practical on NCES-II	01	30	02	04
ABILITY ENHANCEMENT	**BCA – T 105**						
		NPAE-T201	English Language and Indian Culture	02	30	02	04
		NPAE-T202	Yoga And Meditation	02	30	02	04
TOTAL				**24**			

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2022-23

Scheme of Examination (Revised under NEP - As per Ordinance 14-A)

BCA Part I – Semester II

Course Name	Course Code	Max. Marks					Min. Marks			
		Theory Examination		Practical Examination		TOTAL MARKS	Theory Exam.		Practical Marks	
		External	Internal	External	Internal		External	Internal	External	Internal
MAJOR COURSES (ANY ONE) TYPE 2 - CREDIT 06 (04+02)										
Computer Application	BCA – T 201	**60**	**40**	-	-		**21**	**14**	-	-
Practical on CA	BCA – P 201	-	-	**60**	**40**		-	-	**21**	**14**
MINOR COURSES (ANY ONE) TYPE 2 - CREDIT 06 (04+02)										
Computer Application	BCA – T 201	60	**40**	-	-		**21**	**14**	-	-
Practical on CA	BCA – P 201	-	-	**60**	**40**		-	-	**21**	**14**
GENRIC ELECTIVE COURSES (ANY ONE) TYPE 1 - CREDIT 04 (04+00)										
Commerce	**NPGE-T209**	**60**	**40**	-	-		**21**	**14**	-	-
Mathematics	**NPGE-T210**	**60**	**40**	-	-		**21**	**14**	-	-
GENRIC ELECTIVE COURSES (ANY ONE) TYPE 2 - CREDIT 04 (03+01)										
Computer Application	**NPGE-T211**	**60**	**40**	-	-		**21**	**14**	-	-
Practical on CA	**NPGE-P211**	-	-	**100**	-		-	-	**35**	-
Physics	**NPGE-T212**	**60**	**40**	-	-		**21**	**14**	-	-
Practical on PHY	**NPGE-P212**	-	-	**100**	-		-	-	**35**	-
ABILITY ENHANCEMENT - CREDIT 04 (04+00)										
English Language and Indian Culture	NPAE-T210	**30**	**20**	-	-		**11**	**7**	-	-
Yoga And Meditation	NPAE-T211	**30**	**20**	-	-		**11**	**7**	-	-
TYPE 1 - 03 Theory										
TOTAL MARKS		**400**		-			**200**		-	
TYPE 2 - 02 Theory + 01 Theory + Practical										
TOTAL MARKS		**500**		-			**250**		-	
TYPE 3 - 01 Theory + 02 Theory + Practical										
TOTAL MARKS		**600**		-			**300**		-	
TYPE 4 - 03 Theory + Practical										
TOTAL MARKS		**700**		-			**350**		-	

Syllabus
B.C.A. Part I – Semester I

BCA - T101 – COMPUTER SYSTEM ARCHITECTURE

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 04 Hours **Total Lectures: 60**

Course Learning Outcomes:

On Completion of this course, learners will be able to:

1. Understand the basic structure, operation and characteristics of digital computer.
2. Be able to design simple combination digital circuits based on given parameters.
3. Familiarity with working of arithmetic and logic unit as well as the concept of pipelining.
4. Know about hierarchical memory system including cache memories and virtual memory.
5. Understand concept and advantages of parallelism, threading, multiprocessors and multicore processors.

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions

Unit-I	**12 Lectures**
Fundamentals of Digital Electronics: Data Types, Complements. Fixed-Point Representation, Floating-Point Representation, Binary and other Codes, Error Detection Codes. Logic Gates, Boolean Algebra, Map Simplification, Combinational Circuits, Sequential Circuits, simple combination circuit design problems. **Circuits**- Adder- Subtractor, Multiplexer, Demultiplexer, Decoders, Encoders Flip – Flops, Registers, Counters. Basic Computer Organization: Instructive codes, Computer Registers, Computer Instruction, Timing & Control Instruction Cycle, Memory Reference Instruction, Input – Output & Interrupts, Complete Computer Description & Design of Basic Computer.	
Unit-II	**14 Lectures**
Instructions – Instructions formats, Addressing modes, Instructions Codes, Machine language, Assembly language. **Register Transfer and Micro operations –** Register Transfer Language, Register Transfer, Bus & Memory Transfer, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations. **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. **Pipelining –** concept of pipelining, introduction to Pipelined data path and control – Handling Data hazards & Control hazards.	
Unit-III	**12 Lectures**
Memory and I/O Systems – Peripheral Devices, I/O Interface, Data Transfer Schemes – Program Control, Interrupt, DMA Transfer. I/O Processor. Memory Hierarchy, Processor vs. Memory Speed, High-Speed Memories, Main memory, Auxiliary Memory, cache Memory, Associative Memory, Interleaving, Virtual Memory, Memory Management.	
Unit-IV	**10 Lectures**
Parallelism – meaning, types of parallelism, introduction to Instruction-level-parallelism, Parallel processing challenges, Applications. **Flynn's classification** – Introduction to SISD, SIMD, MISD, MIMD **Hardware multithreading** – Introduction, types, advantages and applications. **Multicore processors** – Introduction, advantages, difference from multiprocessor.	

Syllabus

B.C.A. Part I – Semester I

BCA - T101 -COMPUTER SYSTEM ARCHITECTURE

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 04 Hours **Total Lectures: 60**

Unit-V	**12 Lectures**
Indian contribution to the field – Contribution of reputed scientists of Indian origin – like – Dr. Vinod Dham – Father of Intel Pentium Processor, Dr. Ajay Bhat – Co-Inventor of USB Technology, Dr. Vinod Khosla – Co-Founder of Sun Microsystems, Dr. Vijay P Bhatkar – Architect of India's national initiative in supercomputing, and many others. Parallel Computing projects of India – PARAM, ANUPAM, FLOSOLVER, CHIPPS etc. Other relevant contributors and contributions.	

TEXTBOOK:

Suggested Readings:

- M. Morris mano, "Computer System Architecture", PHI.
- Heuring Jordan, "Computer System Design & Architecture" (A.W.L.)
- William Stalling, "Computer Organization & Architecture", Pearson Education Asia.
- V. Carl Hamacher, "Computer Organization", TMH
- Tannenbaum, "Structured Computer Organization", PHI.

Suggestive digital platform web links:
https://www.youtube.com/watch?v=4TzMyXmzL8M
https://nptel.ac.in/courses/106/106/106106166/
https://nptel.ac.in/courses/106/106/106106134/
Suggested equivalent online courses
https://nptel.ac.in/courses/106/105/106105163/

Syllabus

B.C.A. Part I – Semester I

BCA - P101 – PRACTICAL ON COMPUTER ARCHITECTURE

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 08 Hours **Total Lectures: 60**

Course Learning Outcomes

On completion of this course, learners will be able to:

1. Realization of the basic logic and universal gates.
2. Verify the behaviour 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.

Suggested Practicals:

1. To study basic gates (AND, OR, NOT) and verify their truth tables.
2. To convert a given binary number to Gray code using IC 7486.
3. To study and verify NND as Universal gate using IC 7400.
4. To study half adder using basic gates and verify its truth table.
5. To study Full Adder using basic gates and verify its truth table.
6. To realize basic gates (AND, OR, NOT) from Universal gates (NAND and NOR).
7. To verify truth table of 4-bit adder using IC7483.
8. To design and construct RS flip flop using gates and verify the truth table.
9. To design and construct KJ flip flop using gates and verify the truth table.
10. To verify DeMorgan's Theorem.

Suggested Readings:

- M. Morris mano, "Computer System Architecture", PHI.
- Heuring Jordan, "Computer System Design & Architecture" (A.W.L.)
- William Stalling, "Computer Organization & Architecture", Pearson Education Asia.
- V. Carl Hamacher, "Computer Organization", TMH
- Tannenbaum, "Structured Computer Organization", PHI.

Suggestive digital platform web links:
https://www.youtube.com/watch?v=4TzMyXmzL8M
https://nptel.ac.in/courses/106/106/106106166/
https://nptel.ac.in/courses/106/106/106106134/
Suggested equivalent online courses
https://nptel.ac.in/courses/106/105/106105163/

Syllabus

B.C.A. Part I – Semester I

BCA - T102 – OPERATING SYSTEM-I

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 04 Hours **Total Lectures: 60**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Unit-I	**10 Lectures**
Operating system definitions, its components, evolution of operating system, types of operating systems: batch, multiprogramming, multitasking, multiprocessor, real time, client-server, distributed, operating system services, system calls.	
Unit-II	**12 Lectures**
Process scheduling: concept of a process, process states, PCB, process life cycle, operations on processes, context switch, types of schedulers, CPU burst- I/O burst cycles, dispatcher, scheduling criteria, scheduling algorithms — FCFS, SJF, STRN, Round Robin, priority, event driven, multilevel queue.	
Unit-III	**14 Lectures**
Basic Memory Management: Definition, Logical and Physical address map. Memory allocation: Contiguous Memory allocation – Fixed and variable partition – Internal and External fragmentation and Compaction. Paging, Page allocation, Protection and sharing – Disadvantages of paging	
Unit-IV	**14 Lectures**
Virtual Memory: Basics of Virtual Memory Locality of reference, Page fault, Dirty page/Dirty bit – Demand paging (Concepts only). Page Replacement policies : Optimal (OPT) , First in First Out (FIFO) and Least Recently used (LRU) .	
Unit-V	**10 Lectures**
Deadlocks: Definition, Deadlock characteristics, Deadlock Prevention, Deadlock Avoidance: banker's algorithm, Deadlock detection and Recovery.	

TEXT BOOK:

1. Operating System Concepts(8th Edition) by Silberschatz, Peter B. Galvin and Greg Gagne, Wiley- Indian Edition (2010)
2. Modern Operating Systems (Third Edition) by Andrew S Tanenbaum, Prentice Hall India (2008).

Syllabus

B.C.A. Part I – Semester I

BCA - P101 – PRACTICAL ON OPERATIN SYSTEM

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 08 Hours **Total Lectures: 60**

	MS DOS & UNIX/LINUX Practical:
1.	Create Directory – College Sub Directory – Course Sub Directory - Commerce and files in it – B. Com, B.A, B. Sc
2.	Create a Directory - Market Sub Directory – Vegetables and files tomato and potato – rename potato as Potatoes and delete the file potato Sub Directory - Fruits and files mango and apple
3.	Create a Directory – Subject Sub Directory – Computers and file FIT – Create a Copy as Information Technology.
4.	DOS- Commands (Internal & External) • Perform these commands internal commands: DIR,TYPE,DEL,ERASE,MD,CD,COPY,RMDIR,VER,DATE,TIME,PATH,CLS,RMDIR,VER,DATE,TIME,PATH,CLS,BREAK, SET,EXIT. • Perform external commands: APPEND, CHKDISK, ATTRIB, SYS, EDIT.
5.	Apply UNIX/LINUX operating system basic commands: Passwd, Cal, Who, Man other users, Date, Clear, Exit, ls, cat, pwd, mv, cp, banner, rm , mkdir, cat, chmod, cmp, echo, head, tail etc.

Syllabus
B.C.A. Part I – Semester I

BCA – T 103 (NEGE) – GENERIC ELECTIVE – ANY ONE (GE) –
NPGE-T101-MATRICES, GEOMETRY AND VECTOR ALGEBRA-I

MAX. MARKS: 60+40 **MIN. PASS MARKS: 21+14**
No. of Lectures per Week: 04 Hours **Total Lectures: 60**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Learning Outcomes (CLO):

Students will be able to use the Matrices. Determinants. Geometry. and Vector approach in different areas of business and science like budgeting. sales projection. cost estimation. anal. sin the results of an experiment etc.

Unit-I	**14 Lectures**
Determinants Basic Properties of Determinants Minor determinant. Cofactors Applications of determinants in finding the area of the triangle	
Unit-II	**12 Lectures**
Matrices Concept of Matrices Notation order and equality of Matrices Types of Matrices Transpose of a Matrix	
Unit-III	**14 Lectures**
Addition and multiplication Multiplication with a scalar Simple properties of addition. multiplication and scalar multiplication	
Unit-IV	**10 Lectures**
Adjoint and inverse of a square Matrix	
Unit-V	**10 Lectures**
Rank and Nullity of Matrix	

Suggested Readings:

1. Nita H. Shah, Foram A. Thakkar: Matrix and Determinant Fundamentals and Applications. CRC Press. 2020.

Reference Books:

1. Hari Kishan: A Textbook of Matrices. Atlantic Publishers & Dist,. 2008
2.Shanti Narayan and P K Mittal: A Textbook of Matrices. S. chand PubliShing. 1953.

Syllabus
B.C.A. Part I – Semester I

BCA - T105 (NPAE) – ABILITY ENHANCEMENT -
NPAE- T101 – HINDI AND SANSKRITI

भाषा और संस्कृति

MAX. MARKS:30+20 **MIN. PASS MARKS: 11+7**

No. of Lectures per Week: 2 Hours **Total Lectures:30**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

कोर्स अधिगम उपलब्धि (लर्निंग आउटकम)(CLO):

1. उत्कृष्ट साहित्यिक पाठो के अध्ययन से रूचि का विकास करना ।
2. सांस्कृतिक चेतना और राष्ट्रीय भावना का विकास करना।
3. भाषा–ज्ञान।
4. सामान्य शब्दावली और विशेष शब्दावली के अध्ययन द्वारा भाषा एवं संस्कृति बोध का विकास करना
5. विशिष्ट शब्दावली (बीज शब्द / की वर्ड)से परिचित करवाते हुए बोध के स्तर का विकसित करना।
6. प्रतियोगी परीक्षाओं हेंतु तैयार करना।

Unit-I	**06 Lectures**
हिन्दी भाषा 1. मैथिलीशरण गुप्त परिचय पाठः मातृभूमि(कविता) 2. प्रेमचन्द परिचय पाठःशतरंज के खिलाडी (कहानी) 3. पर्यायवाची शब्द विलोम भाब्दः अनेक शब्द के लिए एक शब्द (हिन्दीव्याकरण)	
Unit-II	**06 Lectures**
1 व्यग्य शरद जोशी–जीप पर सवार इल्लियॉ् 2 वैचारिक–भारतीय भाषाओं में राम 3 संधि और उसके प्रकार (हिन्दीव्याकरण)	
Unit-III	**06 Lectures**
हिन्दी भाषा 1. आचार्य रामचन्द्र शुक्ल परिचय पाठः उत्साह (भावमूलक निबन्ध) 2. रामधारी सिंह दिनकर परिचय पाठःभारत एक है (संस्कृत) 3. समास और उसके प्रकार (हिन्दीव्याकरण)	
Unit-IV	**06 Lectures**
हिन्दी भाषा 1. आदिशंकराचार्य– जीवन व दर्शन 2. बीज शब्द–धर्म अद्वैत भाषा,अवधारणा उदारीकरण । 4. अफसर (निबंध) शरद जोशी	
Unit-V	**06 Lectures**
1 आचरण की सभ्यता (निबंध) सरदार पूरनसिंह 2 नैतिक मूल्य –परिचय और वर्णीकरण (आलेख) 3 अन्तर्ज्ञान एवं नैतिक जीवन	

Syllabus

B.C.A. Part I – Semester I

BCA - T105 (NPAE) – ABILITY ENHANCEMENT -

NPAE- T101 – HINDI AND SANSKRITI

भाषा और संस्कृति

MAX. MARKS:30+20 **MIN. PASS MARKS: 11+7**

No. of Lectures per Week: 2 Hours **Total Lectures:30**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

सारबिन्दु (की वर्ड):

सर्च करे

मैथिलीशरणगुप्त : मैथिलीशरणगुप्त की कविता मातृभूमि

प्रेमचंद : प्रेमचंद शंतरज के खिलाडी

रामधारी सिंह दिनकर : भारत एक है रामधारी सिंह दिनकर

आचार्य रामचन्द शुक : उत्साह निबन्ध रामचन्द शुक्ल

ज्ञान चतुर्वेदी : सूर्यग्रहण और चूहे व्यंग्य

स्वामी विवेकानन्द : शिकागो व्याख्यान

धर्म क्या है

मिथक का अर्थ

भाषा विकास

भाषा परिभाषा

अवधारणा का अर्थ एवं परिभाषा

उदारीकरण की विशेषता

पयार्यवाची शब्द

विलोम शब्द

अनेक शब्द के लिए एक शब्द

सन्धि

BOOKS :

पाठ्य पुस्तके सन्दर्भ पुस्तकें,अन्य संसाधन

1 प्रेमचन्द–मानसरोवर खण्ड

2 आचार्य रामचन्द्र शुक्ल चितामणि भाग 1

3 डॉ वासुदेव नन्दन प्रसाद : आधुनिक हिन्दी व्याकरण और रचना, भारती भवन ,ठाकुर बाडी रोड पटना बिहार

4 डॉ राजेश्वर चतुर्वेदी, हिन्दी व्याकरण–उपकार प्रकाशन आगरा उ.प्र.

5 ज्ञान चतुवेदीः इक्यावन व्यंग्य रचनाएं

6 हिन्दी ज्ञान कोश

7 इन्टर नेट सामग्री–टैग में उल्लेखित

Syllabus

B.C.A. Part I – Semester I

BCA - T105 (NPAE) – ABILITY ENHANCEMENT -
NPAE- T102 – ENVIRONMENTAL EDUCATION

MAX. MARKS: 30+20 **MIN. PASS MARKS:11+7**

No. of Lectures per Week: 02 Hours **Total Lectures:30**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Learning Outcomes (CLO):

1. To understand the various aspects of life forms, ecological processes, and the impacts on them by the human during Anthropogenic era.
2. To build capabilities to identify relevant environmental issues, analyze the various underlying causes, evaluate the practices and policies, and develop framework to make inform decisions.
3. To develop empathy for all life forms, awareness, and responsibility towards environmental protection and nature preservation.
4. To develop the critical thinking for shaping strategies such as; scientific, social, economic, administrative & legal, environmental protection, conservation of biodiversity, environmental equity and sustainable development.

Unit-I	**06 Lectures**
Environment and its Components • Multidisciplinary nature, Scope and Importance of Environment • Components of environment: Atmosphere, hydrosphere, Lithosphere. And Biosphere. **Keywords: Environment**	
Unit-II	**06 Lectures**
Natural Resources • Brief account of natural Resources and associated problems: Land Resources, Water Resource, Energy Resource • Concept of Sustainability and Sustainable Development **Keywords: Forest, Mineral, Food, Land, Water, Energy, Sustainable Development**	
Unit-III	**06 Lectures**
Biome, Ecosystem and Biodiversity: • Major Biomes: Tropical, Temperate, Forest, Grassland, Desert, Tundra, Wetland, Estuarine and Marine • Ecosystem: Structure function and types their Preservation& Restoration • Biodiversity and its conservation practices. **Keywords: Biome, Ecosystem, Biodiversity**	
Unit-IV	**06 Lectures**
Environmental Pollution: • Pollution: Types, Control measures, Management and associated problems. • Environmental Law and Legislation: Protection and conservation Acts. • International Agreement & Program.	

Syllabus
B.C.A. Part I – Semester I

BCA - T105 (NPAE) – ABILITY ENHANCEMENT -
NPAE- T102 – ENVIRONMENTAL EDUCATION

MAX. MARKS: 30+20 **MIN. PASS MARKS:11+7**

No. of Lectures per Week: 02 Hours **Total Lectures:30**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Unit-V	**06 Lectures**
Pollution Management and social Issues: • Environmental Movements, Communication and public awareness programme. • National and International organisations related to environment conservation and monitoring. • Role of information Technology in environment and human health. **Key words: Pollution, Environmental Legislation, Environmental Movement, Environmental programme and organisation.**	
Suggested Activities: (at least one) 1. Visit to an area to document environmental assets: rivers /forest /flora/ fauna 2. Visit to a local polluted site Urban/ Rural/ Industrial/ Agricultural 3. Study of simple ecosystem	

Textbooks, Reference Books, Other Resources

1. Singh; J S., Singh S P. And Gupta, S R; " Ecology; Environment Science and Conservation", S Chand Publishing, New Delhi, (2018)
2. Divan, S. And Rosencranz, A, "Environmental Law and Policy in India: Cases, Material & Status" Oxford University Press, India,(20020 2ND Edition.
3. Odum, E. P. , 'Fundamental of Ecology'. Philadelphia Saundres, (1971)
4. Bharucha, Erach, "Environmental Studies" University Press India Pvt Ltd. Hyderbad (2014) (Hindi edition also available).
5. Kaushik , Anubha, Kaushik, C. P. "Perspective in Environmental Studies" New Age International Publishers, (2018), 6th Edition.
6. Asthana, D. K.. Asthana Meera, " Atextbook of Environmental Studies" S Chand Publishing New Delhi, (2007)
7. National Digital Library(https://ndl.iitkgp.ac.in/homestudy/science)
8. Epg.pathshala (https://epgp.inflibnet.ac.in/home/Download)
9. NPTEL(https//nptel.ac.in/course.html)
10. Coursera(https://www.coursera.org/search?query =environmental+science&page=1)

Suggested equivalent online course-

i. The health Effects of Climatic Change (edx)
ii. Climate Change: Financial risks and Opportunities (edx)
iii. Introduction to Environmental Law and Policy (coursera)
iv. Women in Environmental biology(coursera)
v. Our Earth: It's Climate, History, and Processes(coursera)

Syllabus

B.C.A. Part I – Semester II

BCA – T201– PROGRAMMING METHODOLOGIES & DATA STRUCTURES

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 04 Hours **Total Lectures: 60**

Course Learning Outcomes:

On Completion of this course, learners will be able to:

1. Develop simple algorithms and flow charts to solve a problem with programming using top down design principles.
2. Writing efficient and well-structures computer algorithms/programs.
3. Learn to formulate iterative solutions and array processing algorithms for problem.
4. Use recursive techniques, pointers and searching methods in programming.
5. Will be familiar with fundamental data structures, their implementation; become accustomed to the description of algorithms in both functional and procedural styles.
6. Have knowledge of complexity of basic operations like insert, delete, search on these data structures.
7. Possess ability to choose a data structure to suitably model any data used in computer applications.
8. Design programs using various data structures including hash tables, Binary and general search trees, heaps, graphs etc.
9. Assess efficiency tradeoffs among different data structure implementations.
10. Implement and know the applications of algorithms for searching and sorting etc.
11. Know the contributions of Indians in the field of programming and data structures.

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Unit-I	**14 Lectures**
Introduction of Programming –Program Concept, Characteristics of Programming, Algorithms, , Flowcharts. Basic of C++: A Brief history of C++, Compiling and Linking, Tokens, Keywords, Identifiers & Constants, Basic Data Types, User- Defined Data Types, Operator in C++, Scope Resolution Operator, Member Dereferencing Operators, Manipulators. **Function in C++:** The Main Function, Function Prototyping, Call by Reference, Call by Value, Inline Function, Function Overloading, Function with Array. **Classes & Objects:** A Sample C++ Program with class, Defining Member Functions, Making an Outside Function Inline, Nesting of Member Function, Private Member Functions, Arrays within a class, Static Data Members, Static Member Functions, Array of objects, Object as Function Arguments, Friend Functions, Virtual Functions.	
Unit-II	**14 Lectures**
Constructor & Destructor: Constructor, Parameterized Constructor, Multiple Constructors in a class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructor and Destructor. **Inheritance:** Defining Derived Classes, Single Inheritance, Making a Private Member Inheritable, Multilevel inheritance, Hierarchical Inheritance, Multiple Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes Constructor in Derived Classes, Nesting of Classes. Operator Overloading & Type Conversion, Polymorphism, Exception Handling.	

Syllabus

B.C.A. Part I – Semester II

BCA – T201– PROGRAMMING METHODOLOGIES & DATA STRUCTURES

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 04 Hours **Total Lectures: 60**

Unit-III	**14 Lectures**
Data Structure: Basic Concepts, Linear and Non-Linear data structures **Arrays:** Representation of single, two-dimensional arrays, triangular arrays, sparse matrices-array and linked representations. **Stacks:** Operations, Array and Linked Implementations, Applications-Infix to Postfix Conversion, Infix to Prefix Conversion, Postfix Expression Evaluation, Recursion Implementation . **Queue:** Definition, Operations Array and Linked Implementations, Circular Queue- Insertion and Deletion Operations, Dequeue (Double Ended Queue), Priority Queue-Implementations.	
Unit-IV	**14 Lectures**
Linked Lists: Singly Linked Lists, Concatenating, circularly linked lists, Doubly Linked lists, Doubly Circular Linked List **Trees:** Representation of Trees, Binary tree, Properties of Binary Tree Representations- Array and Linked Representations-Array and Linked Representations, Binary Tree Traversals, Threaded Binary Trees **Heap:** Definition, Insertion, Deletion.	
Unit-V	
Graphs: Graph ADT, Graph Representations, Graph Traversals, Searching. **Hashing:** Introduction, Hash tables, Hash functions. **Sorting:** Bubble Sort, Selection Sort, Insertion Sort, Merge Sort. **Search Trees:** Binary Search Trees, AVL Trees – Definition and Examples. **Indian Contribution to field:** Innovations in India, origin of Julia Programming Language, Indian Engineers who designed new programming languages, open-source languages	

Suggested Readings:

- Problem Solving and Program Design in C, J.R. Hanly and E.B. Koffman, Pearson, 2015.
- E. Balguruswamy, "C++" TMH Publication ISBN O-07-462038-X.
- Herbertz Shiels, "C++ The Complete Reference" TMH Publication ISBN 0-07-463880-7.
- R. Lafore, "Object Oriented Programming C++"
- N. Dale and C. Weems, Programming and problem solving with C++: brief edition, Jones & Barlett Learning.
- Adam Drozdek, "Data Structures and algorithm in C++", Third Edition, Cengage Learning.
- Sartaj Sahani, Data Structures, Algorithms and Applications with C++, McGraw Hill.
- Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.
- D.S. Malik, Data Structures using C++, Second edition, Cengage Learning.
- M.A. Weiss, Data Structures and Algorithms Analysis in C, 2nd edition, Pearson.

Suggestive digital platform web links:

https://www.youtube.com/watch?v=BCIS40yzssA
https://www.youtube.com/watch?v=vLnPwxZdW4Y&vl=en
https://www.youtube.com/watch?v=Umn1ZQ51tZw
https://www.youtube.com/watch?v=AT141CXuMKI&list=PLdo5W4Nhv31bbKJzrsKfMpo_grxuL18LU

Syllabus

B.C.A. Part I – Semester II

BCA – P201 – PROGRAMMING METHODOLOGIES & DATA STRUCTURES

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 08 Hours **Total Lectures: 60**

Course Learning Outcomes

On completion of this course, learners will be able to:

1. Develop simple algorithms and flow charts to solve a problem with programming using top down design principles.
2. Writing efficient and well-structures 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.
5. Possess ability to choose a data structure to suitably model any data used in computer applications
6. Implementation of algorithms for searching and sorting.

Given the problem statement, students are required to formulate problem, develop flowchart/algorithms, write code in C++, execute and test it. Students should be given assignments on following:

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 check whether a given number is even or odd.
5. Write a program to print table of any number.
6. Write program to print Fibonacci series.
7. Write program to find factorial of a given number.
8. Write program to convert decimal (integer) number into equivalent binary number.
9. Write a program to check given string in palindrome or not
10. Write program to perform multiplications of two matrices.
11. Write program to print digits of entered number in reverse order.
12. Write program to print sum of two matrices.
13. Write program to print multiplication of two matrices.
14. Write program to generate even/odd series from 1 to 100.
15. Write program whether a given number is prime or not.
16. Write a program for call by value and call by reference.
17. Write program to create a pyramid structure

    *

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18. Write program to create a pyramid structure

    1

    12

    123

    1234

19. Write program to check entered number is Armstrong or not.
20. Write program for traversing an Array.
21. Write program to input N numbers, add them and find average.
22. Write program to find largest element from an array.
23. Write program for Linear search.

Syllabus
B.C.A. Part I – Semester II

24. Write program for Binary search.
25. Write program for Bubble sort.
26. Write program for selection sort.

Suggested Readings:

- Problem Solving and Program Design in C, J.R. Hanly and E.B. Koffman, Pearson, 2015.
- E. Balguruswamy, "C++" TMH Publication ISBN O-07-462038-X.
- Herbertz Shiels, "C++ The Complete Reference" TMH Publication ISBN 0-07-463880-7.
- R. Lafore, "Object Oriented Programming C++"
- N. Dale and C. Weems, Programming and problem solving with C++: brief edition, Jones & Barlett Learning.
- Adam Drozdek, "Data Structures and algorithm in C++", Third Edition, Cengage Learning.
- Sartaj Sahani, Data Structures, Algorithms and Applications with C++, McGraw Hill.
- Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.
- D.S. Malik, Data Structures using C++, Second edition, Cengage Learning.
- M.A. Weiss, Data Structures and Algorithms Analysis in C, 2nd edition, Pearson.
- Lipdchutz: Schaum's Outline series Data structures, Tata Mcgraw-Hill.

Suggestive digital platform web links:

https://www.youtube.com/watch?v=BCIS40yzssA
https://www.youtube.com/watch?v=vLnPwxZdW4Y&vl=en
https://www.youtube.com/watch?v=Umn1ZQ51tZw
https://www.youtube.com/watch?v=AT141CXuMKI&list=PLdo5W4Nhv31bbKJzrsKfMpo_grxuL18LU

Syllabus
B.C.A. Part I – Semester II

BCA – T202 – OPERATING SYSTEM-II

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**
No. of Lectures per Week: 04 Hours **Total Lectures: 60**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Unit-I	**10 Lectures**
Inter process Communication: Race Conditions, Critical Section, Mutual Exclusion, Hardware Solution, Peterson's Solution, The Producer Consumer Problem, Semaphores.	
Unit-II	**12 Lectures**
File Management: File concept, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods (contiguous, linked, indexed), Free-space management (bit vector, linked list, grouping), directory implementation (linear list, hash table)	
Unit-III	**14 Lectures**
I/O management & Disk scheduling: I/O Devices, Organization of I/O functions, Operating System Design issues, I/O Buffering, Disk Scheduling (FCFS, SCAN,C-SCAN, SSTF), RAID.	
Unit-IV	**14 Lectures**
Security and protection: security threats and goals, penetration attempts. Security policies and mechanisms, authentication, protection and access control.	
Unit-V	**10 Lectures**
Linux Operating System: introduction, History and features of Linux. Linux architecture, file system of Linux, boot block, super block, inode. System Calls, Elementary Linux commands, Directory Structure. Concept of Open source software. Indian contribution to the field – the BOSS operating system, growth of linux, aryabhatt linux, contribution of innovators- Rajensheth, sunder pichai etc.	

TEXT BOOK:

1. Operating System Concepts(8th Edition) by Silberschatz, Peter B. Galvin and Greg Gagne, Wiley- Indian Edition (2010)
2. Modern Operating Systems (Third Edition) by Andrew S Tanenbaum, Prentice Hall India (2008).

Syllabus

B.C.A. Part I – Semester II

BCA – P202 –PRACTICAL ON OPERATING SYSTEM-II

MAX. MARKS: 50 **MIN. PASS MARKS: 20**

No. of Laboratory per Week: 04 Hours **Total Lectures: 64**

Practical based on DOS: introduction to PCs with related Hardware, software, DOS its variations, and Starting DOS.
DOS Commands: internal External Commands, common Commands notation, files & file command, Disk Command, Batch files introduction to batch processing, creation of batch file special batch file, autoexec.bat hard disk setup, configuring a system, creation of subdirectories, pipelines, filter and miscellaneous.

BCA-II SEM Suggestive List of Linux Practical's	
1.	Linux Directory Commands: pwd, mkdir, lm -rf, ls, cd,cd /,cd
2.	Linux File Commands: touch, cat, cal >, cat >>, rrn , cp, mv, rename
3.	Linux Permission Commands:su, id, useradd, passwd, groupadd, chmod, groupdel, chown, chgrp
4.	Linux File Content & Filter Commands: head, tail, tac, more, 1ess, grep, cai, cut, grep, comm, sed, tee, tr, uniq, wc, od, sor1, diff.
5.	Linux Utility Commands: find, bc, locate, date, cal, sleep, time, df, mount, exit, clear, gzip, gwzip.
6.	Linux Networking Commands: ip, ssh, mail, ping, host
7.	Edit Crontab file: to wall message on system on particular time automatically.
8.	Vi editor: Create file, edit, save and quit. Highlighting the searched term within a file. cut, yank,udno.
9.	Basic of shell programming.

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B.C.A. Part I – Semester II

BCA – T 203 (NEGE) – GENERIC ELECTIVE – ANY ONE (GE) –
NPGE-T201-MATRICES, GEOMETRY AND VECTOR ALGEBRA-I

MAX. MARKS: 60+40 **MIN. PASS MARKS: 21+14**

No. of Lectures per Week: 04 Hours **Total Lectures: 60**

Course Learning Outcomes (CLO):

Students will be able to use the Matrices. Determinants. Geometry. and Vector approach in different areas of business and science like budgeting. sales projection. cost estimation. anal. sin the results of an experiment etc.

Unit-I	**13 Lectures**
Two-dimensional coordinate geometry, shifting of origin Slope of a line : Angle between two lines Various forms of equations of a line in two dimension Parallel to axes Point slope form Slope-intercept form Two point form Intercept form and normal form General equation of a line	
Unit-II	**13 Lectures**
Distance of a point from a line in two dimension Three dimensional coordinate geometry Coordinate axes and coordinate planes Coordinates of a point Distance between two points and section formula	
Unit-III	**12 Lectures**
Vectors and scalars Magnitude and direction of a vector direction cosines and direction ratios of a vector Types of vectors and position vector of a point Negative of a vector and components of a vector Operations on Vectors Addition of vectors Multiplication of a vector by a scalar	

Syllabus
B.C.A. Part I – Semester II

BCA – T 203 (NEGE) – GENERIC ELECTIVE – ANY ONE (GE) –
NPGE-T201-MATRICES, GEOMETRY AND VECTOR ALGEBRA-I

MAX. MARKS: 60+40 **MIN. PASS MARKS: 21+14**
No. of Lectures per Week: 04 Hours **Total Lectures: 60**

Unit-IV	**11 Lectures**
Position vector of a point dividing a line segment in a given ratio Properties and application of Scalar (dot) product of vectors	
Unit-V	**11 Lectures**
Vector (cross) product of vectors ,properties and applications , vector and scalar triple product	
Keywords: Three dimensional coordinate geometry	

Suggested Readings:

1. P K Mittal and Shanti Narayan: Vector Algebra. S.Chand Publishing,. 2005

Reference Books:

1.Hari Kishan: Vector Algebra and Calculus. Atlantic Publishers & Dist. 2007

Syllabus

B.C.A. Part I – Semester II

BCA – T205 (NPAE) – ABILITY ENHANCEMENT –
NPAE-T201-ENGLISH LANGUAGE AND INDIAN CULTURE

MAX. MARKS:30+20 **MIN. PASS MARKS: 11+7**

No. of Lectures per Week: 2 Hours **Total Lectures:30**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Learning outcomes (CLO)

Through this course the students will be able to:

1 Prepare for various competitive exams by developing their English language competence.
2 Promote their comprehension skills by being exposed to a variety of texts and their interpretations.
3 Build and enhance their Vocabulary.
4 Develop their Communication Skills by strengthening grammar and usages.
5 Inculcate values which make them aware of national heritage and environmental issues, making them responsible citizens.

Unit-I	**08 Lectures**
Reading, Writing and Interpretation Skills: 1. Where The Mind is Without Fear – Rabindranath Tagore **(Key Word: Patriotism)** 2. National Education – M.K. Gandhi **(Key Word: Edification)** 3. The Axe – R.K Narayan **(Key Word: Environment)** 4. The Wonder That Was India–A.L Basham (an excerpt) **(Key Word: Indian Mythology)** 5. Preface to the Mahabharata – C. Rajagopalachari **(Key Word: Indian Mythology)**	
Unit-II	**06 Lectures**
Basic Language Skills: Vocabulary Building: Suffix, Prefix, Synonyms, Antonyms, Homophones, Homonyms and One-word substitution	
Unit-III	**05 Lectures**
Basic Language Skills Basic Grammar: Noun, Pronoun, Adjective, Verb, Adverb, Prepositions, Articles, Time and Tenses	
Unit-IV	**05 Lectures**
Comprehension Skills: Unseen Passage followed by multiple choice questions, Dialogue Writing: Definition, How to write a good dialogue, Dialogue writing on Urban and Rural Life, Indoor and Outdoor Games, Print and Electronic Media etc.	
Unit-V	**06 Lectures**
Composition: Paragraph Writing-All that glitters is not gold, A friend in need is a friend indeed, Where there is will there is way, Work is worship, God help those who help themselves etc. Application for leave, Scholarship, Duplicate Mark sheet etc.	

Textbooks, Reference Books, Other Resources

- Essential English Grammar – Raymond Murphy, Cambridge University Press.
- Practical English Grammar Exercises 1 – A.J Thomson & A.V. Martinet, Oxford India.
- Practical English Usage – Michael Swan, Oxford
- English Grammar in Use – Raymond Murphy, Cambridge University Press.

Syllabus

B.C.A. Part I – Semester II

BCA – T205 (NPAE) – ABILITY ENHANCEMENT –
NPAE-T202-YOGA AND MEDITATION

MAX. MARKS:30+20 **MIN. PASS MARKS: 11+7**

No. of Lectures per Week: 2 Hours **Total Lectures:30**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Learning outcomes (CLO) :

After studying this course, students will be able to:

Take care of their own physical, mental, emotional, social and spiritual health.

Unit-I	**06 Lectures**
Introduction to Yoga and Yogic Practices: • Yoga: Etymology, definitions, aim, objectives and misconceptions • Yoga: Its Origin, history and development • Rules and regulations to be followed by Yoga Practitioners • Yoga in Modern Times: Yogic Traditions of Swami Vivekananda, Shri Aurobindo; Maharshi Ramana and Maharshi Dayanand Saraswati **Key words**: History and Development of Yoga	
Unit-II	**06 Lectures**
Yogic Practices in Life • Introduction to Yoga Practices • Shatkarma: Meaning, purpose and their significance in "Yoga Sadhana" • Introduction to Yogic Loosening practices and Surya Namaskar **KeyWords**: Shatkarma, Common Yogic Practices.	
Unit-III	**06 Lectures**
Breathing Practices and Pranayama • Sectional Breathing (Abdominal, Thoracic and Clavicular) • Yogic Deep Breathing • Concept of Puraka, Rechaka and Kumbhaka • Concept of Bandha and Mudra Key Words: Yogic Deep breathing, Puraka, Bandha, Mudra.	
Unit-IV	**06 Lectures**
Breathing Practices and Pranayama • AnulomaViloma/ NadiShodhana • Shitali • Bhramari **Key Words:** Sectional Breathing, Deep Breathing, Bandha & Mudra, Shitali, Bhramari.	

Syllabus

B.C.A. Part I – Semester II

BCA – T205 (NPAE) – ABILITY ENHANCEMENT –
NPAE-T202-YOGA AND MEDITATION

MAX. MARKS:30+20 **MIN. PASS MARKS: 11+7**

No. of Lectures per Week: 2 Hours **Total Lectures:30**

Unit-V	**06 Lectures**

Practices leading to Meditation:

- Recitation of Pranava Mantra
- Recitation of Hymns, in vocations and prayers
- Anter Maun
- Breath Meditation
- Om Dhyana

Key Words: Pranav Mantra, Antermaun, Breath Meditation, Om Dhyan

Textbooks, Reference Books, Other Resources:

Suggested Readings:

- Singh S.P & Yogi Mukesh: Foundationof Yoga, Standard Publication, New Delhi, 2010
- Swami Dhirendra Brahmchari: Yogasana Vijnana, Dhirendra Yoga Publication, New Delhi, 1966
- Saraswati, Swami Satyanand: Asana, Pranayama, Mudra, Bandha (APMB), Yoga Publication Trust, Munger, 2013
- H.R. Nagendra: Asana, Pranayama, Mudra, Bandha, Swami Vivekananda Yog Prakashan, Bangalore, 2002
- Ishwar Bhardwaj: Saral Yogasana, Satyam Publishing House, New Delhi, 2018
- Shri Rai Singh Chouhan: Mudra Rahasya, Bhartiya Yog Sansthan, New Delhi, 2014
- Dr. Vishwanath Prasad Sanha: Dhyan Yoga, Bhartiya Yog Sansthan, New Delhi, 1987
- Shri Deshraj: Dhyan Sadhana, Dhyan Sadhana, Bhartiya Yog Sansthan, New Delhi, 2015

Suggestive digital platforms web links:

1. www.rishikeshnathyogshala.com

Suggested equivalent online courses:

1. https://shayji.com/hathayoga-course
2. https://theyogainstitute.org

Scheme of Examination (Revised under NEP - As per Ordinance 14-A)

CBCS System

Scheme of Examination

&

Syllabus

For

Bachelor of Computer Application

(B.C.A.)

Part II – Semester III & IV

SESSION 2022-23

CHRISTIAN EMINENT COLLEGE, INDORE

ACADEMY OF MANAGEMENT, PROFESSIONAL EDUCATION & RESEARCH

An Autonomous Institution Established in 1996

AFFILIATED TO DEVI AHILYA VISHWAVIDYALAYA, INDORE

F-SECTOR, R.S.S. NAGAR, H.I.G. MAIN ROAD, INDORE

CHRISTIAN EMINENT COLLEGE, INDORE

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F-Sector, H.I.G., Ravi Shankar Shukla Nagar Main Road, Indore (M.P.) – 452011

2022-23

Scheme of Examination (Revised under NEP - As per Ordinance 14-A)

B.C.A. Part II – Semester III

COURSE TYPE	COURSE NAME	COURSE CODE	COURSE TITLE	CREDITS	TOTAL HOURS	LECTURE HOURS PER WEEK	MIN. GRADE POINT OUT OF 10
MAJOR	Computer Application	**BCA – T 301**	Data Communication And Computer Networks	04	60	04	04
		BCA – P 301	Practical on CSA	02	60	08	04
MINOR	Computer Application	**BCA – T 302**	Internet Applications Using Java Programming-I	04	60	04	04
		BCA – P 302	Practical on IAJP	02	60	08	04
GENRIC ELECTIVE ANY ONE	**BCA – T/P 303**						
	Computer Application	NPGE-T301	E-Commerce-I	04	60	04	04
	Computer Application	NPGE-T302	Internet Of Things (IOTs)-I	04	60	04	04
	Mathematics	NPGE-T303	**Optimization Techniques-I**	04	60	04	04
VOCATIONAL COURSE	**BCA – T 304**						
		NPVO-T301	Karyatmak Hindi Avam Naitik Mulya	02	30	02	04
		NPVO-T302B	Web designing-I	02	30	02	04
TOTAL				**20**			

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2022-23

Scheme of Examination (Revised under NEP - As per Ordinance 14-A)

BCA Part II – Semester III

Course Name	Course Code	Max. Marks					Min. Marks			
		Theory Examination		Practical Examination		TOTAL MARKS	Theory Exam.		Practical Marks	
		External	Internal	External	Internal		External	Internal	External	Internal
MAJOR COURSES (ANY ONE) TYPE 2 - CREDIT 06 (04+02)										
Computer Application	BCA – T 301	60	40	-	-		21	14	-	-
Practical on CA	BCA – P 301	-	-	60	40		-	-	21	14
MINOR COURSES (ANY ONE) TYPE 2 - CREDIT 06 (04+02)										
Computer Application	BCA – T 302	60	40	-	-		21	14	-	-
Practical on CA	BCA – P302	-	-	60	40		-	-	21	14
GENRIC ELECTIVE COURSES (ANY ONE) TYPE 1 - CREDIT 04 (04+00)										
Computer Application	NPGE-T301	60	40	-	-		21	14	-	-
Computer Application	NPGE-T302	60	40				21	14	-	-
Mathematics	NPGE-T303	60	40	-	-		21	14	-	-
VOCATIONAL COURSES - CREDIT 04 (04+00)										
Karyatmak Hindi Avam Naitik Mulya	NPVO-T301	30	20	-	-		11	7	-	-
Web Designing-I	NPVO-T302B	30	20	-	-		11	7	-	-
TYPE 1 - 03 Theory										
TOTAL MARKS		400		-			200		-	
TYPE 2 - 02 Theory + 01 Theory + Practical										
TOTAL MARKS		500		-			250		-	
TYPE 3 - 01 Theory + 02 Theory + Practical										
TOTAL MARKS		600		-			300		-	
TYPE 4 - 03 Theory + Practical										
TOTAL MARKS		700		-			350		-	

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2022-23

Scheme of Examination (Revised under NEP - As per Ordinance 14-A)

B.C.A. Part II – Semester IV

COURSE TYPE	COURSE NAME	COURSE CODE	COURSE TITLE	CREDITS	TOTAL HOURS	LECTURE HOURS PER WEEK	MIN. GRADE POINT OUT OF 10
MAJOR	Computer Application	BCA – T 401	Database Management Systems Using Pl/Sql	04	60	04	04
		BCA – P 401	Practical on DBMS	02	60	08	04
MINOR	Computer Application	BCA – T 402	Internet Applications Using Java Programming-II	04	60	04	04
		BCA – P 402	Practical on IAJP-II	02	60	08	04
GENRIC ELECTIVE ANY ONE	**BCA – T/P 403**						
	Computer Application	NPGE-T401	E-Commerce-II	04	60	04	04
	Computer Application	NPGE-T402	Internet Of Things (IOTs)-II	04	60	04	04
	Mathematics	NPGE-T403	**Optimization Techniques-II**	04	60	04	04
VOCATIONAL COURSE	**BCA – T 404**						
		NPVO-T401	Advance English & Entrepreneurship Practices	02	30	02	04
		NPVO-T402B	Web designing-II	02	30	02	04
TOTAL				**24**			

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2022-23

Scheme of Examination (Revised under NEP - As per Ordinance 14-A)

BCA Part II – Semester IV

Course Name	Course Code	Max. Marks					Min. Marks			
		Theory Examination		Practical Examination		TOTAL MARKS	Theory Exam.		Practical Marks	
		External	Internal	External	Internal		External	Internal	External	Internal
MAJOR COURSES (ANY ONE) TYPE 2 - CREDIT 06 (04+02)										
Computer Application	BCA – T 401	**60**	**40**	-	-		**21**	**14**	-	-
Practical on CA	BCA – P 401	-	-	**60**	**40**		-	-	**21**	**14**
MINOR COURSES (ANY ONE) TYPE 2 - CREDIT 06 (04+02)										
Computer Application	BCA – T 402	60	**40**	-	-		**21**	**14**	-	-
Practical on CA	BCA – P 402	-	-	**60**	**40**		-	-	**21**	**14**
GENRIC ELECTIVE COURSES (ANY ONE) TYPE 1 - CREDIT 04 (04+00)										
Computer Application	NPGE-T401	60	40	-	-		21	14	-	-
Computer Application	NPGE-T402	60	40				21	14	-	-
Mathematics	NPGE-T403	60	40	-	-		21	14	-	-
VOCATIONAL COURSES - CREDIT 04 (04+00)										
Advance English & Entrepreneurship Practices	NPVO-T401	**30**	**20**	-	-		**11**	**7**	-	-
Web Designing-II	NPVO-T402B	**30**	**20**	-	-		**11**	**7**	-	-
TYPE 1 - 03 Theory										
TOTAL MARKS		**400**		-			**200**		-	
TYPE 2 - 02 Theory + 01 Theory + Practical										
TOTAL MARKS		**500**		-			**250**		-	
TYPE 3 - 01 Theory + 02 Theory + Practical										
TOTAL MARKS		**600**		-			**300**		-	
TYPE 4 - 03 Theory + Practical										
TOTAL MARKS		**700**		-			**350**		-	

Syllabus

B.C.A. Part II – Semester III

BCA – T301 – DATA COMMUNICATION AND COMPUTER NETWORKS

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 04 Hours **Total Lectures: 60**

Course Learning Outcomes:

1. Build an understanding of the fundamental concepts of computer networking.
2. Demonstrate the Basic Concepts of Networking, Networking Principles and working of Networking Devices.
3. Demonstrate the Significance, Purpose and application of Networking protocols and Standards.
4. Describe, compare and contrast LAN, MAN, WAN.
5. Explain the working of Layers and apply the various protocols of OSI & TCP/IP model.

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions

Unit-I	**12 Lectures**
Network goals and application, Network structure, Network services, Example of networks and Network Standardization, Networking models: centralized, distributed and collaborative, Network Topologies: Bus, Star, Ring, Tree, Hybrid: Selection and Evaluation factors.	
Unit-II	**12 Lectures**
Theoretical Basis for Data communication, Transmission media, Twisted pair (UTP, STP), Coaxial Cable. Fiber optics: Selection and Evaluation factors. Line of Sight Transmission, Communication Satellites. Analog and Digital transmission. Transmission and switching, frequency division and time division multiplexing, STDM, Circuit switching, packet switching and message switching,	
Unit-III	**12 Lectures**
Brief Overview of LAN (Local Area Network): Classification. Brief overview of Wide Area Network (WAN). Salient features and differences of LAN with emphasis on: Media, Topology, Speed of Transmission, Distance, Cost. Terminal Handling, Polling, Token passing, Contention. IEEE Standards: their need and developments.	
Unit-IV	**12 Lectures**
Open System: What is an Open System? Network Architectures, ISO-OSI Reference Model, Layers: Application, Presentation, Session, Transport, Network, Data Link & Physical. Physical Layer - Transmission, Bandwidth, Signaling devices used, media type. Data Link Layer-: Addressing, Media Access Methods, Logical link Control, Basic algorithms/protocols.	
Unit-V	**12 Lectures**
Network Layer: Routing: Fewest-Hops routing, Type of Service routing, Updating Gateway routing information. Brief overview of Gateways, Bridges and Routers, Gateway protocols, routing daemons. OSI and TCP/IP model. TCP/IP and Ethernet. The Internet: The structure of the Internet, the internet layers, Internetwork problems. Internet Standards.	

Text Books:

1. Tannanbaum, A.S.: Computer Networks, Prentice Hall
2. Fourauzan B., "Data Communication and Networks", 3rd Edition, TMH.

Reference Books:

1. Comer D., "Computer Networks and Internet", 2nd Edition, Pearson Education.
2. William Stallings, "data and Computer Communications".

Syllabus

B.C.A. Part II – Semester III

BCA - P101 – PRACTICAL ON DATA COMMUNICATION AND COMPUTER NETWORKS

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 08 Hours **Total Lectures: 60**

S.No	Experiment
1	Study of different types of Network cables and Practically implement the cross-wired cable and straight through cable using clamping tool.
2	Study of Network Devices in Detail.
3	Study of network IP.
4	Connect the computers in Local Area Network.
5	Study of basic network command and Network configuration commands.
6	Configure a Network topology using packet tracer software.

Syllabus
B.C.A. Part II – Semester III

BCA – T302 – CORE COURSE II – INTERNET APPLICATIONS USING JAVA PROGRAMMING-I

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 04 Hours **Total Lectures: 60**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Outcomes:

1. Use an integrated development environment to write, compile, run and test simple object oriented java programs.
2. Use object oriented programming concepts to solve real world problems.
3. Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.
4. Develop software in the Java programming language, (application)

Unit-I	**10 Lectures**
The Java Environment: History and features of java, C++ Vs Java, OOPS concept, how java works, the concept of PATH and CLASS PATH, A simple program, its compilation and execution, JAVA Program Structure, Java Virtual Machine concepts, java platform overview, Primitive data types, variables and constants, identifier.	
Unit-II	**12 Lectures**
Operators - Arithmetic Operator, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators; Operators, Type Conversions in Expressions, Operator Precedence and Associativity Mathematical Functions. **Decision Making** with if Statement, Simple if Statement, if.....Else Statement, Nesting of if ...else Statement if else Ladder, The Switch Statement, The? Operator. **Loops-** While Statement, Do Statement, For Statement, Jump in Loops...	
Unit-III	**14 Lectures**
Object Oriented Programming in Java: Classes, objects and methods: defining a class, adding variables and methods, creating objects, constructor, Instances, field and methods initialization by constructors, Copy constructor, memory allocation and garbage collection in java keywords, access methods Arrays, String and String buffer classes, Wrapper classes, using the JDK tools.	
Unit-IV	**14 Lectures**
Inheritance: Inheritance basics, Super class, Sub-class, Method overloading, abstract classes. **Interfaces:** defining an interface, implementing & applying interfaces, variables in interfaces, extending interfaces.	
Unit-V	**10 Lectures**
Multithreading and Exception Handling: Basic idea of multithreaded programming; The lifecycle of a thread, Creating thread with the thread class and runnable interface, Thread scheduling, Basic idea of exception handling: The try, catch and throw, throws.	

Textbooks:

1. Schildt Java Complete Reference TMH.
2. Naughton & Schildt "The Complete Reference Java 2" TMH
3. E. Balagurusamy, "Programming with Java".

Syllabus

B.C.A. Part II – Semester III

BCA – P302 – PRACTICAL ON INTERNET APPLICATIONS USING JAVA PROGRAMMING-I

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 08 Hours **Total Lectures: 60**

Given the problem statement, students are required to write code in Java, execute and test it.

Students should be given assignments on following:

1. Write a program to print numbers in words using **Nested if and Switch Case.**
2. Write a program called **Pass Fail** which prints "PASS" if the int variable "mark" is more than or equal to 50; or prints "FAIL" otherwise
3. Write a program called **Odd Even** which prints "Odd Number" if the int variable "number" is odd, or "Even Number" otherwise.
4. Write a Program to find sum & average of 10 no. using arrays.
5. Write a program to display reverse of a digit no. using array.
6. Write a program to display grade according to the marks obtained by the student.
7. Find the factorial of number if number is given by user using command line argument.
8. Write a program to print Fibonacci series.
9. Write a program to display tables from 2 to 10.
10. Write a program to take an input from user and check given number is prime or not.
11. Write a program to implement method overriding.
12. Write a program to convert given string into. Uppercase and lowercase and get the length of string Using array
13. Write a program to overload volume method to find out volume of cube and cuboid.
14. Write a program to design a class using abstract Methods and Classes.
15. Write a program to implement multiple inheritances by using Interface.
16. Write a program to create a package of your name and use that package in a class
17. Write a program to implement parameterized constructor with default argument.
18. Develop a simple real life application to illustrate the use of multithreading.

Syllabus

B.C.A. Part II – Semester III

BCA – T 303 (NEGE) – GENERIC ELECTIVE – ANY ONE (GE) –
NPGE-T301-E-COMMERCE-I

MAX. MARKS: 60+40 **MIN. PASS MARKS: 21+14**

No. of Lectures per Week: 04 Hours **Total Lectures: 60**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Learning Outcomes (CLO):

On the completion of this course student will be able –

* To learn the fundamentals of E-Commerce and its process.
* To understand the role of E-commerce in the present scenario along with the concepts of security and its applications.
* To gain knowledge of e-commerce business needs and resources and match to technology considering human factors and budget constraints.
* To apply knowledge of changing technology on traditional business models and strategy.
* To have skills to Communicate effectively and ethically using electronic communication.

Unit-I	**10 Lectures**
Introduction Brief history of e-commerce, Types, Advantages & Disadvantages of e-commerce, Elements of e-commerce, Principles of e-commerce, Messaging and Information distribution, Messaging and information distribution, Common service infrastructure, other key support layers.	
Unit-II	**12 Lectures**
EDI to e-commerce: EDI Origin, System approach and communication approach, Migration to open EDI-Approach Benefits, Mechanics, E-com with WWW/Internet. E-Government Concepts, Applications of G2C, G2B, G2G	
Unit-III	**14 Lectures**
Electronic communication PC and networking, Network topologies and communication media, E-mail, OSI and TCP/IP Models, LAN, WAN, MAN.	
Unit-IV	**14 Lectures**
Internetworking - Bridges and gateways, Internet Vs Online services, Open vs. Closed Architecture, Controlled contained Vs Uncontrolled contained, Metered Pricing Vs Flat pricing Innovation Vs Control.	
Unit-V	**10 Lectures**
WWW & Electronic Payment System: Applications - what is web, Why is the Web such a hit, The Web and E-Com, Concepts & Technology -Key concepts, Web Software development Tools.	

Suggested Readings Books:

1. "Electronic Commerce" by Ravi Kalakota and Andrew B. Whinston.
2. "Web Commerce Technologies Handbook" by Daniel Minoli and Emma Minoli.
3. "E-Commerce" by Dr. Varinder Bhatia.
4. "Promise of E-Governance" by M P Gupta.

Syllabus
B.C.A. Part II – Semester III

BCA – T 303 (NEGE) – GENERIC ELECTIVE – ANY ONE (GE) –
NPGE-T302- INTERNET OF THINGS (IOTS)-I

MAX. MARKS: 60+40 **MIN. PASS MARKS: 21+14**
No. of Lectures per Week: 04 Hours **Total Lectures: 60**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Learning Outcomes (CLO):

On the completion of this course student will be able –

After completing this course student will be able to:

1. To understand the basics of Internet of Things
2. To get an idea of some of the application areas where Internet of Things can be applied
3. To understand the middleware for Internet of Things and the concepts of Web of Things
4. To understand the concepts of Cloud of Things with emphasis on Mobile cloud computing
5. To understand the IOT protocols

Unit-I	**10 Lectures**
Introduction: Definition, Characteristics of IOT, IOT Conceptual framework, IOT Architectural view, Physical design of IOT, Logical design of IOT, Application of IOT.	
Unit-II	**12 Lectures**
M2M to IoT-The Vision-Introduction, From M2M to IoT, M2M towards IoT-the global context, A use case example, Differing Characteristics. Definitions, M2M Value Chains, IoT Value Chains.	
Unit-III	**14 Lectures**
Machine-to-machine (M2M), SDN (software defined networking) and NFV (network function virtualization) for IOT data storage in IOT, IOT Cloud Based Services.	
Unit-IV	**14 Lectures**
Design Principles for Web Connectivity: Web Communication Protocols for connected devices, Message Communication Protocols for connected devices control.	
Unit-V	**10 Lectures**
SOAP, REST, HTTP Restful and Web Sockets.	

Textbooks:

1. Rajkamal, "Internet of Things", Tata McGraw Hill publication.
2. Hakima Chaouchi "The Internet of Things: Connecting Objects", Wiley publication.

Reference books:

1. Philip Levis, "TinyOS Programming".

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B.C.A. Part II – Semester III

BCA – T 303 (NEGE) – GENERIC ELECTIVE – ANY ONE (GE) –
NPGE-T303- OPTIMIZATION TECHNIQUES-I

MAX. MARKS: 60+40 **MIN. PASS MARKS: 21+14**
No. of Lectures per Week: 04 Hours **Total Lectures: 60**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Learning Outcomes (CLO):

On the completion of this course student will be able –

1. Formulate real life problems into linear programming problem.
2. Apply the simplex method to find an optimal vector for the standard linear programming problem and the corresponding dual problem.
3. Find optimal solution of transportation.

Unit-I	**10 Lectures**
Linear Programming Problem: Basic concepts of linear programming problem Simplex method and algorithm Artificial variables technique	
Unit-II	**12 Lectures**
Linear Programming Problem: Two-phase method Big-M method **Duality:** Definition and formulation of the dual problem Primal-dual relationships	
Unit-III	**14 Lectures**
Economic interpretation of the dual Dual simplex Method Sensitivity analysis	
Unit-IV	**14 Lectures**
Transportation Problems: Mathematical model Balanced and unbalanced problems Degeneracy	
Unit-V	**10 Lectures**
Optimality conditions Methods to find starting solution and optimal solution Algorithm for solving transportation problem Northwest-Comer method Least cost method Vogel approximation method for determination of starting basic solution	

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B.C.A. Part II – Semester III

BCA – T 303 (NEGE) – GENERIC ELECTIVE – ANY ONE (GE) –
NPGE-T303- OPTIMIZATION TECHNIQUES-I

MAX. MARKS: 60+40 **MIN. PASS MARKS: 21+14**
No. of Lectures per Week: 04 Hours **Total Lectures: 60**

Suggested Readings:

Text Books:

1. KantiSwarup, P.K. Gupta and Manmohan: Opertions Research, Sultan Chand and Sons, New Delhi, 2014.
2. S. D. Sharma: Operations Research, KedarNath Publication, 2012.
3. Nita H. Shah, Ravi M. Gor and HardikSoni: Operations Research, PHI Learning Pvt. Ltd., 2007.
4. Book published by M.P. Granth Academy, Bhopal

Reference Books:

1. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali:Linear Programming and Network Flows, 2nd Ed., John Wiley and Sons, India, 2004.
2. F.S. Hillier and G.J. Lieberman:Introduction to Operations Research, 9th Ed., Tata McGraw Hill, Singapore, 2009.
3. Hamdy A. Taha:Operations Research, An Introduction, 8th Ed., Prentice-Hall India, 2006.
4.Prem Kumar Gupta and D.S.Hira: Operations Research-An Introduction, S.Chand & SonsCompany Ltd.,New Delhi, 1995.

Suggested Digital Platforms Web links: https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=25
https://www.highereducation.mp.gov.in/?page=xhzIQmpZwky1Qo2b%2Fy5G7w%3D%3D **Suggested Equivalent online courses:**
https://nptel.ac.in/courses/110106062/ https://nptel.ac.in/courses/111107128/
https://ugcmoocs.inflibnet.ac.in/index.php/courses/view_ug/275
http://www.mphindigranthacademy.org/

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B.C.A. Part II – Semester III

BCA – T 304 (NEVO) – VOCATIONAL COURSE
NPVO-T301 – KARYATMAK HINDI AVAM NAITIK MULYA

MAX. MARKS:30+20 **MIN. PASS MARKS: 11+7**

No. of Lectures per Week: 2 Hours **Total Lectures:30**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

उपयुक्त पाठ्यक्रम द्वारा छात्र:

1. कार्यात्मक हिंदी एवं उसके क्षेत्र के बारे में जान पाएंगे
2. छात्र भारतीय संविधान हिंदी भाषा संबंधित प्रावधानों एवं भाषा के विविध रूप जान पाएंगे एवं छात्र हिंदी भाषा की अशुद्धियां जानकर उन्हें संशोधित करने में सक्षम हो पाएंगे
3. छात्र कार्यालयी हिंदी के प्रयोग में सक्षम हो पाएंगे
4. छात्र नैतिक मूल्यों को जानकर नैतिक आचरण व्यवहार में लाने में सक्षम हो पाएंगे

छात्र व्यवसायिक जगत के नैतिक मूल्यों को आत्मसात कर अपना व्यवसायिक विकास कर पाएंगे

Unit-I	**06 Lectures**
कार्यात्मक हिंदी 1. परिभाषा और स्वरुप 2. कार्यात्मक हिंदी के क्षेत्र	
Unit-II	**06 Lectures**
हिन्दी भाषा और संवैधानिक प्रावधान 1.राज भाषा नीति 2.हिंदी भाषा के विविध रूप 3. (राजभाषा, राष्ट्रभाषा, माध्यम भाषा, संचार भाषा) नागरी लिपि का मानक रूप 4. हिंदी भाषा की अशुद्धियाँ एवं प्रकार	
Unit-III	**06 Lectures**
कार्यालयी हिंदी 1 प्रारूपण 2 संक्षेपण 3 पल्लवन 4 टिप्पण 5 पारिभाषिक शब्दावली निर्माण के सिद्धांत	

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B.C.A. Part II – Semester III

Unit-IV	**06 Lectures**
नैतिक मूल्य 1 नैतिक मूल्य परिभाषा एवं परिचय 2 मूल्यों की विशिष्टताएं 3 नैतिक मूल्य एवं नैतिकता में अंतर 4 मूल्यों का वर्गीकरण १ सैद्धांतिक २ आर्थिक ३ सामाजिक ४ राजनीतिक ५ धार्मिक ६ सौन्दर्यात्मक मूल्य	
Unit-V	**06 Lectures**
व्यवसायिक नैतिकता /कॉर्पोरेट एथिक्स 1 परिचय 2 अर्थ एवं परिभाषाएं 3 विशेषताएँ एवं उदाहरण 1 4 तत्व एवं सिद्धांत	

सन्दर्भः–

- १ शब्दावली आयोग नई दिल्ली द्वारा निर्मित व प्रकाशित प्रशासनिक शब्दावली का वृहद कोष
- २ हिंदी प्रयोग की दिशाएं : डॉ हरीश चंद्र
- ३ प्रारूपण टिप्पणी और प्रूफ पठन : डॉ विजय कुलश्रेष्ठ
- ४ प्रयोजनमूलक हिंदी : डॉ राकेश कुमार पाराशर
- ५ हिंदी में अशुद्धियां : डॉ रमेश चंद्र मेहरोत्रा
- ६ राजभाषा हिंदी : डॉ भोलानाथ तिवारी
- हिंदी भाषा और नैतिक मूल्य वैज्ञानिक तथा तकनीकी शब्दावली आयोग मध्यप्रदेश हिंदी ग्रंथ अकादमी

अनुशंसित डिजिटल प्लेटफॉर्म वेब लिंकः–

- www.wikipidiya.org
- www.egyankosh.ac.in
- www.youtube.com
- https://epgp.inflibnet.ac.in
- hindiwi.org

Syllabus

B.C.A. Part II – Semester III

BCA – T 304 (NEVO) – VOCATIONAL COURSE - ANY ONE (VO) –
NPVO-T302B – WEB DESIGNING-I

MAX. MARKS:30+20 **MIN. PASS MARKS: 11+7**

No. of Lectures per Week: 2 Hours **Total Lectures:30**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Learning Outcomes:

1. Code a handful of useful HTML & CSS examples
2. Build semantic, HTML & CSS web page
3. Write basic scripts
4. Use Names, Objects, and Methods

Unit-I	**06 Lectures**
Introduction to Internet- World Wide Web, Internet Addressing, Browser, URL, Web server, website, homepage, Domain Name. Basic concepts. **Softwares for Web Designing -** Notepad/Notepad++, Dreamweaver, Blue Griffon, Net beans, Sea Monkey, Word press, Sublime. **Introduction to HTML:** HTML Tags and Attributes, HTML Basic Tags, Formatting Tags, HTML Color Coding, Div and Span Tags for Grouping. Lists: Unordered Lists, Ordered Lists, Definition list. Images: Image and Image Mapping.	
Unit-II	**06 Lectures**
Hyperlink: URL- Uniform Resource Locator, URL Encoding. Table: <table> <th>, <tr>, <td>, <caption>, <thead>, <tbody>, <tfoot>, <colgroup>, <col>. Attributes Using Iframe as the Target **Form:** <input>, <textarea>, <button>, <select>, <label> **Headers:** Title, Base, Link, Styles, Script HTML Meta Tag, XHTML, HTML Deprecated Tags & Attributes	
Unit-III	**06 Lectures**
CSS: Introduction, Features and benefits of CSS, CSS Syntax, External Style Sheet using <link>, Multiple Style Sheets, Value Lengths and Percentages. **Selectors:** ID Selectors, Class Selectors, Grouping Selectors, Universal Selector, Descendant/Child Selectors, Attribute Selectors, CSS - Pseudo Classes. **Color Background Cursor:** background-image, background-repeat, background position, CSS Cursor	
Unit-IV	**06 Lectures**
Text Fonts: color, background-color, text-decoration, text-align, vertical-align, text-indent, text-transform, white-space, letter-spacing, word-spacing, line-height, font-family, font-size, font-style, font-variant, font-weight. **Lists Tables:** list-style-type, list-style-position, list-style-image, list-style, CSS Tables (border, width & height, text-align, vertical-align, padding, color) **Box Model:** Borders & Outline, Margin & Padding, Height and width, CSS Dimensions.	
Unit-V	**06 Lectures**
Display Positioning: CSS Visibility, CSS Display, CSS Scrollbars, CSS Positioning (Static Positioning, Fixed Positioning, Relative Positioning, Absolute Positioning), CSS Layers with Z-Index. **Floats:** The float Property, The clear Property, The clearfix Hack.	

BOOKS:

1. John Duckett ,HTML and CSS: Design an build websites , wiley
2. Steven M. Schafer, HTML, XHTML and CSS Bible , wiley

Syllabus

B.C.A. Part II – Semester IV

BCA – T401– DATABASE MANAGEMENT SYSTEMS USING PL/SQL

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 06 Hours **Total Lectures: 60**

Course Learning Outcomes:

On Completion of this course, learners will be able to:

1. Describe the fundamental elements of relational database management systems.
2. Understand the basic concepts and the applications of database systems.
3. Create and populate a RDBMS for a real life application, with constraints and keys, using SQL.
4. Retrieve any type of information from a database by formulating complex queries in SQL.
5. Improve the database design by normalization.

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Unit-I	**12 Lectures**
Introduction to DBMS: Why database? Characteristics of data in database, DBMS. What are database advantages of DBMS? **Database Architecture and Modelling:** Conceptual, physical and logical database models, Role of DBA, Database design. **Entity Relationship (ER) Model:** Components of ER-model, ER modelling symbols, Relationships. **Enhanced Entity Relationship (EER) Model:** An introduction, Superclass and subclass entity types, Specialization, Generalization, Attribute inheritance, Categorization & Aggregation.	
Unit-II	**12 Lectures**
The Relational Data Model: Fundamental Concepts: Relations, Null Values, Keys, Foreign Keys, Integrity Constraints-Entity Integrity & Relational Integrity. **Normalization Process:** First Normal Form, Functional Dependencies, Second Normal Form, Third Normal Form, Boyce-Codd Normal Form (BCNF), Fourth Normal Form; Other Normal Forms - Fifth Normal Form & Domain/Key Normal Form. **Transforming a Conceptual Model to a Relational Model:** Transforming Objects Sets and Attributes, Transforming Models without External Keys, Transforming Specialization and Generalization Object Sets, Transforming Relationships: One-One Relationships, One-Many Relationships, Many-Many Relationships; Transforming Aggregated Object Sets, Transforming Recursive Relationships.	
Unit-III	12 **Lectures**
Relational database implementation: Relational Algebra and Calculus Relational Algebra: Union, Intersection, Difference, Product, Select, Project, Join Natural, Theta & Outer Join, Divide, and Assignment. Relational Calculus: Target list & Qualifying Statement, The Existential Quantifier, The Universal Quantifier.	

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B.C.A. Part II – Semester IV

BCA – T401– DATABASE MANAGEMENT SYSTEMS USING PL/SQL

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 06 Hours **Total Lectures: 60**

Unit-IV	12 **Lectures**
Relational database implementation (continued): Relational Implementation with SQL Relational Implementations: An Overview. Schema and Table Definition: Schema definition, Data types & domains, Defining Tables, Column Definition. **Data Manipulation:** Simple Queries (SELECT, FROM, WHERE), Multiple-Table Queries, Subqueries, Correlated Subqueries, EXISTS and NOT EXISTS operators, Built-In Functions (SUM, AVG, COUNT, MAX, and MIN), GROUP BY and HAVING clause, Built-In Functions with Subqueries. **Relational Algebra Operations:** UNION, INTERSECT, EXCEPT, JOIN. **Database Change Operations:** INSERT, UPDATE, DELETE. Using SQL with Data Processing Languages; View Definition, Restrictions on View Queries and Updates.	
Unit-V	**12 Lectures**
Physical Database Systems: Introduction, Physical Access of the Database. **Physical Storage Media:** Secondary Storage, Physical Storage Blocks. Disk Performance Factors: Access Motion Time, Head Activation Time, Rotational Delay, Data Transfer Rate, Data Transfer Time. Data Storage Formats on Disk: Track Format, Record Format-Fixed Length Records & Variable-Length Records, Input/output Management. File Organizing and Addressing Methods: Sequential File Organization, Indexed Sequential File Organization, Direct File Organization, Hashing: Static Hash Functions and Dynamic Hash Functions.	

Textbooks:

1. Abraham Silberscharz, Henry F. Korth, S. Sudharshan, "Database System Concepts", 6th Edition, TMH.
2. C.J. Date, "An Introduction to Database System", 8th Edition, Pearson.

Reference Books:

1. Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database System", 7th Edition, Pearson.

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B.C.A. Part II – Semester IV

BCA – P401 –PRACTICL ON DATABASE MANAGEMENT SYSTEMS USING PL/SQL

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 08 Hours **Total Lectures: 60**

Note: Solve the following queries using EMP, DEPT, SALGRADE tables

1. List the name & employee code of the employee whose salary is more than 1500.
2. List the name & salary of the employee who is working in deptno 30.
3. List the name & salary of the employee who is working as an Analyst in deptno 10.
4. List the name & job of the employee whos salary more than 1000 but less than 2000.
5. List all the deptno from EMP table.
6. List the name & salary of the employee who is working in deptno10, 20, and 30.
7. List the name & salary of the employee who is not working in deptno10, 20.
8. List the entire analyst who is working in deptno 20.
9. Display the following output. "SCOTT IS A MANAGER IN DEPARTMENT NUMBER 10 "
10. List the entire clerk whose salary is more than 800 & not working for deptno 10.
11. Give bonus of Rs 500 to all employees working for deptno 30.
12. Find the total salary of the each employee working for deptno 20.
13. Find the oldest employee.
14. List the name of the employee whose salary is more than 1000 & working either in dept 10 or 20.
15. List the name & salary of the employee who are getting no commission for dept 10.
16. List the name & employee code of the employee whose salary is not in the range of 1000 & 1800.
17. List the id & job of the employee whose salary > 2000 & name starts with S.
18. List all employees who joined in 1981.
19. List all employee names and their salaries, whose salary lies between 1500/- and 3500/- both inclusive.
20. List all employees which start with either J or T.
21. List all employee names and their and their manager whose manager is 7902 or 7566 0r 7789.
22. List all employee names and jobs, whose job title includes M or P.
23. List all jobs available in employee table.
24. List all employees who belong to the department 10 or 20.
25. List all employee names, salary and 15% rise in salary.
26. List minimum, maximum, average salaries of employee.
27. Find how many job titles are available in employee table.
28. What is the difference between maximum and minimum salaries of employees in the organization?
29. Find how much amount the company is spending towards salaries
30. Display name of the department with deptno 20.

Single Row Function Queries

1. Find all salesmen earning more than 1000 or earning no commission.
2. List all the employee, sort them job wise in ascending order & department wise in descending order.
3. List first character of each employee name.
4. List employee name & salary having at least 5-character name.
5. List all palindrome name employee.
6. Find the current date.
7. Generate emailed of all the employee having 'first 2 characters of name' then'_' then 'last 2 character of job' & then '@oracle.com'.
8. Find Analyst & Clerk of department 10 earning more than 1000,

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B.C.A. Part II – Semester IV

BCA – P401 –PRACTICL ON DATABASE MANAGEMENT SYSTEMS USING PL/SQL

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 08 Hours **Total Lectures: 60**

Group Function Queries

1. List various jobs.
2. List total salary of each department.
3. List average salary of department 10 & 20.
4. Find total salary of each job
5. Find minimum salary of each department
6. Find job & total salary of employee whose total salary more than 500.
7. Find deptno & total salary of employee who are working for deptno 10.
8. Find deptno & total salary of employee who are not working for deptno 20
9. Find the total annual sal to distribute job wise in the year 81.
10. Display total salary spent for each job category.

Join Queries

1. Find ename, salary, department name of the employee who is working in New York
2. Display the department name of the department no 10
3. List the emps with dept names.
4. Display the location of SMITH.
5. List all the Grade2 and Grade 3 emps.
6. Display all Grade 4, 5 Analyst and Mgr.
7. Find the grade of each employee.
8. Find the grade of each employee & are Clerk.
9. Find the grade of each employee. & in Sales department
10. Find the employee along with their Managers.
11. List all the Grade2 and Grade 3 emps
12. Display all Grade 4,5 Analyst and Mgr.

Sub Queries

1. List the employee working in Smith's dept.
2. List the employee earning more than all Clerks
3. List average salary of only those deptno whose average salary more than 1500
4. List deptno whose salary is greater than 1500 & of deptno 30
5. List employee with their salary & max salary of company
6. Find the Allen's department name
7. List the emps whose jobs same as SMITH or ALLEN.
8. List the Emps who's Sal is same as FORD or SMITH in desc order of Sal.
9. List the Emps whose Sal is > the total remuneration of the SALESMAN.
10. List the emps who are senior to King.
11. List the details of the senior employee belongs to 1981.
12. Find maximum salary from employee of each dept.

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B.C.A. Part II – Semester IV

BCA – T402 – INTERNET APPLICATIONS USING JAVA PROGRAMMING-II

MAX. MARKS: 60 +40 **MIN. PASS MARKS:21+14**

No. of Lectures per Week: 04 Hours **Total Lectures: 60**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Outcomes:

1. The course covers Graphical User Interface (GUI) networking, and database manipulation.
2. To demonstrate the concept of event handling used in GUI.
3. To understand the concepts of Hypertext Mark-up Language.
4. Design and use basic applet for web page.

Unit-I	**10 Lectures**
Applet programming-Local and Remote Applets, Applet Vs Application, creating and executing java applets, inserting applets in a web page, java security, passing parameter to applets, Aligning the Display, HTML Tags & Applet Tag, Getting Input from User.	
Unit-II	**12 Lectures**
The AWT: The class hierarchy of window fundamentals; The basic user interface components Label, Button, Check Box, Radio Button, Choice menu, Text area, Scroll list, Scroll bar; Frame; Layout managers-flow layout, Grid layout, Border layout, Card layout.	
Unit-III	**14 Lectures**
The Java Event Handling Model: Java's event delegation model ignoring the event, Self contained events, Delegating events, The event class hierarchy, The relationship between interface, methods called, parameters and event source; Adapter classes, Event classes action Event, Adjustment Event, Container Event, Focus Event, Item Event, Event, Mouse Event, Text Event, Window Event.	
Unit-IV	**14 Lectures**
Input/output: Exploring Java io, Directories, stream classes The Byte Stream: Input stream, output stream, file input stream, file output stream, print stream, Random access file, the character streams, Buffered reader, buffered writer, print writer, serialization.	
Unit-V	**10 Lectures**
JDBC: JDBC-ODBC bridge, The connectivity model, The driver manager, Navigating the result set object contents, java.sql Package, The JDBC exception classes, Connecting to Remote database.	

Textbooks:

1. Schildt Java Complete Reference TMH.
2. Naughton & Schildt "The Complete Reference Java 2" TMH
3. E. Balaguruswamy, Programming with JAVA –A Primer, E.

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B.C.A. Part II – Semester IV

BCA – P402 –PRACTICAL ON INTERNET APPLICATIONS USING JAVA PROGRAMMING-II

MAX. MARKS: 50 **MIN. PASS MARKS: 20**

No. of Laboratory per Week: 04 Hours **Total Lectures: 64**

Suggestive list of Practical's
Given the problem statement, students are required to write code in Java, execute and test it. Students should be given assignments on following: 1. Develop an applet in Java that displays a simple message. 2. Develop an applet in Java that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named "Compute" is clicked. 3. Write a program for passing parameters using Applet. 4. Write a java program for handling Mouse events and Key events 5. Write a Java program that reads a file and displays the file on the screen 6. Write a java program that connects to a database using JDBC program: 7. Write a java program to connect to database using JDBC & insert values into table 8. Write a java program to connect to a database using JDBC and delete values from table. 9. To handle all mouse events and show event name at the centre of the window when the mouse event is fired.(Use Adapter Classes) 10. Write a Java program to demonstrate the key event handlers.

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B.C.A. Part II – Semester IV

BCA – T 403 (NEGE) – GENERIC ELECTIVE – ANY ONE (GE) –
NPGE-T401- E-COMMERCE-II

MAX. MARKS: 60+40 **MIN. PASS MARKS: 21+14**

No. of Lectures per Week: 04 Hours **Total Lectures: 60**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Learning Outcomes (CLO):

On the completion of this course student will be able –

* To learn the fundamentals of E-Commerce and its process.
* To understand the role of E-commerce in the present scenario along with the concepts of security and its applications.
* To gain knowledge of e-commerce business needs and resources and match to technology considering human factors and budget constraints.
* To apply knowledge of changing technology on traditional business models and strategy.
* To have skills to Communicate effectively and ethically using electronic communication.

Unit-I	**10 Lectures**
Internet, Intranet, Extranet: Features, Advantages & Disadvantages. Connectivity Devices: MODEM, Repeater, Hub, Bridge, Router, Switch, Gateway, Their working & types.	
Unit-II	**12 Lectures**
Electronic payment system - Overview, Electronic or digital cash, Electronic Checks Online credit card based system other 2 Engineering financial instruments, Consumer legal and Business issues.	
Unit-III	**14 Lectures**
E-Commerce & M-Commerce: Types of E-Commerce, Functions, technologies: EDI, PDE, Bar Code etc. E-Business, Difference between E-Commerce & E-Business. Advantages & Disadvantages of E-Commerce and M- Commerce.	
Unit-IV	**14 Lectures**
Security and Application Need of computer security, Specific intruder approaches, Security strategies, Cryptography, Public key encryption, Private key encryption, Digital signatures.	
Unit-V	**10 Lectures**
Advertising on the internet: Marketing, Creating a website. Electronic publishing issues, EP architecture, EP tools, Web page EP-Baseline issues, Application tools and publishing on the internet.	

Books:

1. "Electronic Commerce" by Ravi Kalakota and Andrew B. Whinston.
2. "Web Commerce Technologies Handbook" by Daniel Minoli and Emma Minoli.
3. "E-Commerce" by Dr. Varinder Bhatia.
4. "Promise of E-Governance" by M P Gupta.

Syllabus

B.C.A. Part II – Semester IV

BCA – T 403 (NEGE) – GENERIC ELECTIVE – ANY ONE (GE) –
NPGE-T402- INTERNET OF THINGS (IOTS)-II

MAX. MARKS: 60+40 **MIN. PASS MARKS: 21+14**

No. of Lectures per Week: 04 Hours **Total Lectures: 60**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Learning Outcomes (CLO):

On the completion of this course student will be able –

1. To understand the basics of Internet of Things
2. To get an idea of some of the application areas where Internet of Things can be applied
3. To understand the middleware for Internet of Things and the concepts of Web of Things
4. To understand the concepts of Cloud of Things with emphasis on Mobile cloud computing
5. To understand the IOT protocols

Unit-I	**10 Lectures**
Internet Connectivity Principles: Internet Connectivity, Internet based communication. IP addressing in IOT, Media Access	
Unit-II	**12 Lectures**
Sensor Technology, Participatory Sensing, Industrial IOT and Automotive IOT, Actuator.	
Unit-III	**14 Lectures**
Sensor data Communication Protocols Radio Frequency Identification Technology, Wireless Sensor Network Technology.	
Unit-IV	**14 Lectures**
IOT Design methodology: Specification -Requirement, process, model, service, functional & operational view.	
Unit-V	**10 Lectures**
IOT Privacy and security solutions, Raspberry Pi & arduino devices. IOT Case studies: smart city streetlights control & monitoring.	

Textbooks:

1. Rajkamal, "Internet of Things", Tata McGraw Hill publication.
2. Hakima Chaouchi "The Internet of Things: Connecting Objects", Wiley publication.

Reference books:

1. Philip Levis, "TinyOS Programming".

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B.C.A. Part II – Semester IV

BCA – T 403 (NEGE) – GENERIC ELECTIVE – ANY ONE (GE) –
NPGE-T403- OPTIMIZATION TECHNIQUES-II

MAX. MARKS: 60+40 **MIN. PASS MARKS: 21+14**
No. of Lectures per Week: 04 Hours **Total Lectures: 60**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Learning Outcomes (CLO):

On the completion of this course student will be able –

1. The course will enable the students to:
2. Formulate real life problems into linear programming problem.
3. Formulate and solve linear programming model of two person zero sum game.
4. Solve nonlinear programming problems using Kuhn- Tucker conditions.

Unit-I	**10 Lectures**
Network Analysis: Constraints in network Construction of network Critical Path Method (CPM)	
Unit-II	**12 Lectures**
PERT calculation Resource leveling by network techniques Advances of network (PERT/CPM	
Unit-III	**14 Lectures**
Game Theory: Formulation of two person zero sum games Solving two person zero sum games	
Unit-IV	**14 Lectures**
Games with mixed strategies Graphical solution procedure Linear programming solution of games	
Unit-V	**10 Lectures**
Non-Linear programming techniques Kuhn-Tucker conditions Non-negative constraints	

Syllabus
B.C.A. Part II – Semester IV

BCA – T 403 (NEGE) – GENERIC ELECTIVE – ANY ONE (GE) –
NPGE-T403- OPTIMIZATION TECHNIQUES-II

MAX. MARKS: 60+40 **MIN. PASS MARKS: 21+14**
No. of Lectures per Week: 04 Hours **Total Lectures: 60**

Suggested Readings:
Text Books:
Suggested Readings:
Text Books:

1. KantiSwarup, P.K. Gupta and Manmohan: Opertions Research, Sultan Chand and Sons, New Delhi, 2014.
2. Guillermo Owen: Game Theory, Emerald Publishing Limited, 4th edition, 2013.
3. S. D. Sharma: Operations Research, KedarNath Publication, 2012.
4. Nita H. Shah, Ravi M. Gor and HardikSoni: Operations Research, PHI Learning Pvt. Ltd., 2007.
5. Book published by M.P. Granth Academy, Bhopal

Reference Books:

1. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali:Linear Programming and Network Flows, 2nd Ed., John Wiley and Sons, India, 2004.
2. F.S. Hillier and G.J. Lieberman:Introduction to Operations Research, 9th Ed., Tata McGraw Hill, Singapore, 2009.
3. Hamdy A. Taha:Operations Research, An Introduction, 8th Ed., Prentice-Hall India, 2006.
4.Prem Kumar Gupta and D.S.Hira: Operations Research-An Introduction, S.Chand & SonsCompany Ltd.,New Delhi, 1995.

Suggested Digital Platforms Web links: https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=25
https://www.highereducation.mp.gov.in/?page=xhzIQmpZwky1Qo2b%2Fy5G7w%3D%3D **Suggested Equivalent online courses:**
https://nptel.ac.in/courses/110106062/ https://nptel.ac.in/courses/111107128/
https://ugcmoocs.inflibnet.ac.in/index.php/courses/view_ug/275
http://www.mphindigranthacademy.org/

Syllabus

B.C.A. Part II – Semester IV

BSC – T 404 (NEVO) – VOCATIONAL COURSE – ANY ONE (VO) –
NPVO-T401 – ADVANCE ENGLISH & ENTREPRENEURSHIP PRACTICES

MAX. MARKS:30+20 **MIN. PASS MARKS: 11+7**

No. of Lectures per Week: 2 Hours **Total Lectures:30**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Through this course the students will be able to:

1. Strengthen their grammar and vocabulary.
2. Acquire and develop LSRW (Listening, Speaking, Reading and Writing) skills.
3. Learn to think creatively and critically. After the completion of the course, students are expected to gain competency and proficiency in English language to perform at professional and personal level as well as to face competitive examinations at State and National level.
4. Introduces the students to the basics of entrepreneurship and small business management. It Helps in building the skills, framework and knowledge of entrepreneurship and new venture creation. Helps in achieving competency and proficiency in language for entrepreneurship related correspondence and presentations.
5. Helps the students in understand the importance of the planning process and learn how to develop, write and present an effective business plan for a new venture.

Unit-I	**07 Lectures**
Advance English: Grammar Components- Tense, Parts of Speech, Vocabulary, Idioms, Phrases, Punctuations, Mis-spelt and Inappropriate words, Re-organizing Jumbled sentences, Spotting the errors.	
Unit-II	**04 Lectures**
Comprehension Skills: Multiple choice questions based on unseen passages.	
Unit-III	**06 Lectures**
Language Skills and Writing Skills Advertisement and Notice-writing, Letter Writing (Formal & Informal), Brochures, social media, Email writing. Practice sessions for Conversational English.	
Unit-IV	**06 Lectures**
Entrepreneurship Practices Basic Concept of entrepreneurship, types, Importance and needs of entrepreneurs and significance of entrepreneurship in economic development, Start-up Process, Generation of start-up ideas. Marketing and Advertising, Planning a marketing strategy. Role of English language in entrepreneurship. Speaking Skills and entrepreneurship related correspondence: Oral presentation, delivering group presentations, Presenting a business plan.	
Unit-V	**07 Lectures**
Corporate Ethics and responsibilities, Innovation, and creativity, Writing the business plan/project proposal, writing a report: Outlining a meeting, Minutes of the meeting, Project submission/presentation and appraisal.	
Key Words: Comprehension, Advertisement, Language Skills, Writing Skills Notice-writing ,entrepreneurship, Corporate Ethics, business plan	

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B.C.A. Part II – Semester IV

BSC – T 404 (NEVO) – VOCATIONAL COURSE – ANY ONE (VO) –
NPVO-T401 – ADVANCE ENGLISH & ENTREPRENEURSHIP PRACTICES

MAX. MARKS:30+20 **MIN. PASS MARKS: 11+7**

1. **No. of Lectures per Week: 2 Hours** **Total Lectures:30**

2. Brush up Your English by S.T. Imam.BhartiBhawan Publishers &Distributors,2017
3. S.P.Dhanvel. English and Soft Skills. Orient Black Swan,2010.
4. Dr.M.Farook. English for Communication, Emerald Publishers,2015.
5. Kuratko and Rao,Entrepreneurship:A South Asian Perspective,Cengage Learning.
6. Robert Hisrich,Michel Peters,Dean Shepherd. Entrepreneurship,McGraw-Hill Education
7. Desai,Vasant.Dynamics of Entrpreneurial Development and Management.Mumbai,Himalaya Publishing House
8. Singh Nagendra P.Emerging trends in Entrepreneurship Development.New Delhi:ASEED.
9. SS Khanka,Entrepreneurial Development,S.Chand and Co.,Delhi.

Web Sources:
www.englishclub.com
https://nptel.ac.in
https://www.myenglishpages.com
Online or Web Resources:
http://slbcmadhyapradesh.in/frontmarqee/57le2722-f3ec-4b82-8591-5b4721dff44e-atmanirbhar%20Bharat%@20full%20presentation_compressed.pdf

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Syllabus

B.C.A. Part II – Semester IV

BCA – T 404 (NEVO) – VOCATIONAL COURSE - ANY ONE (VO) –
NPVO-T402 – WEBDESIGNING-II

MAX. MARKS:30+20 **MIN. PASS MARKS: 11+7**

No. of Lectures per Week: 2 Hours **Total Lectures:30**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Learning Outcomes:

1. Code a handful of useful HTML & CSS examples
2. Build semantic, HTML & CSS web page
3. Write basic scripts
4. Use Names, Objects, and Methods
5. Add Interactivity to a Web Page
6. Create Dynamic Web Pages using Java Script in HTML forms.

Unit-I	**06 Lectures**
The JavaScript: Nature of JavaScript, Script Writing Basics, Enhancing HTML Documents with JavaScript, The Building Blocks. Introduction to JavaScript, JavaScript Engines, Values, Variables and Operators, Variable Mutation, Basic Operators, Operator Precedence, JavaScript Types, Types Definition, Types in JavaScript, Objects, Type Conversion and Coercion, Static vs Dynamic Type Checking.	
Unit-II	**06 Lectures**
JavaScript Conditionals: Introduction to Conditionals, Conditionals in JavaScript, Ternary Operators and Conditionals. Conditional Ladder & Switch statement. **JavaScript Arrays:** Introduction to Arrays, Declaring and Mutating Arrays, Array Methods and Properties, Replication with Array Methods, Multi-dimensional Arrays.	
Unit-III	**06 Lectures**
JavaScript Loops: Introduction to Loops, Loops in JavaScript, While and Do/While Loops, For Loops, Break and Continue in Loops, Iterating Arrays, Iterating Objects.	
Unit-IV	**06 Lectures**
JavaScript Functions: Introduction to Functions, Functions in JavaScript, Nested Functions in JavaScript, Arrow Functions in JavaScript, Function as an Argument, Function as the Returned Object, **JavaScript Scope:** Scope Introduction, Scope in JavaScript, Lexical Scope, Module Scope.	
Unit-V	**06 Lectures**
Method of Adding Interactivity to a Web Page, Creating Dynamic Web Pages; Concept of Java Scripting the Forms. Java Scripting the Forms, Basic Script Construction, Talking to the Form Objects, Organizing the Objects and Scripts, Field-Level Validation, Check Required Fields like Validating Zip Code, Automated Formatting, Format Phone, Format Money, Automatic Calculation, Calculate Expiration Date, Calculate Amount etc	

BOOKS:

1. Lee Anner Philips , Using , HTML , PHI

CBCS System

Scheme of Examination

&

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For

Bachelor of Computer Application

(B.C.A.)

Part I, II & III – Semester I, II, III, IV, V & VI

SESSION 2022-23

CHRISTIAN EMINENT COLLEGE, INDORE

ACADEMY OF MANAGEMENT, PROFESSIONAL EDUCATION & RESEARCH

An Autonomous Institution Established in 1996

AFFILIATED TO DEVI AHILYA VISHWAVIDYALAYA, INDORE

F-SECTOR, R.S.S. NAGAR, H.I.G. MAIN ROAD, INDORE

Scheme of Examination

B.C.A. Part III – Semester V

COURSE	CREDITS	TOTAL HOURS	LECTURE HOURS PER WEEK	MIN. GRADE POINT OUT OF 10
CORE COURSE				
BCA – T 501 COMPUTER NETWORKS	03	48	03	04
BCA – T 502 INTRODUCTION TO CLOUD COMPUTING	03	48	03	04
BCA – P 502 PRACTICAL ON COMPUTER NETWORKS & CLOUD COMPUTING	02	32	04	04
BCA – T 503 INTRODUCTION TO DATA SCIENCE	03	48	03	04
BCA – P 503 PRACTICAL ON DATA SCIENCE USING R	02	32	04	04
BCA – T 504 LINEAR ALGEBRA & GEOMETRY	03	48	03	04
BCA – T 505 INFORMATION TECHNOLOGY TRENDS	03	48	03	04
ABILITY ENHANCEMENT COMPULSORY COURSE (AECC)				
BCA – T 506 HUMAN VALUES AND PROFESIONAL ETHICS	02	32	02	04
SKILL ENHANCEMENT / GENERIC COURSE - ANY ONE (SEC/GC)				
BCA – T 507 SKEG (ANY ONE)	SKILL ENHANCEMENT / GENERIC COURSE - ANY ONE (SEC/GC)			
SKEG-T104 DEVELOPMENT OF ENTREPRENEURSHIP	03	48	03	04
SKEG-T105 DIGITAL MARKETING E-COMMERCE AND E-PAYMENT				
SKEG-T108 HEALTH EDUCATION				
SKEG-T119 PERSONALITY DEVELOPMENT				
TOTAL	24	384	28	

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Scheme of Examination

B.C.A. Part III – Semester V

Course	Max. Marks				Min. Marks		
	External Theory Examination	Internal Theory Examination	Practical Examination	TOTAL MARKS	External Theory Exam.	Internal Theory Exam.	Practical Marks
CORE COURSE							
BCA – T 501 COMPUTER NETWORKS	70	30	-	100	28	12	-
BCA – T 502 INTRODUCTION TO CLOUD COMPUTING	70	30	-	100	28	12	-
BCA – P 502 PRACTICAL ON COMPUTER NETWORKS & CLOUD COMPUTING	-	-	50	50	-	-	20
BCA – T 503 INTRODUCTION TO DATA SCIENCE	70	30	-	100	28	12	-
BCA – P 503 PRACTICAL ON DATA SCIENCE USING R	-	-	50	50	-	-	20
BCA – T 504 LINEAR ALGEBRA & GEOMETRY	70	30	-	100	28	12	-
BCA – T 505 INFORMATION TECHNOLOGY TRENDS	70	30	-	100	28	12	-
ABILITY ENHANCEMENT COMPULSORY COURSE (AECC)							
BCA – T 506 HUMAN VALUES AND PROFESIONAL ETHICS	70	30	-	100	28	12	-
SKILL ENHANCEMENT / GENERIC COURSE - ANY ONE (SEC/GC)							
BCA – T 507 SKEG (ANY ONE)	SKILL ENHANCEMENT / GENERIC COURSE - ANY ONE (SEC/GC)						
SKEG-T104 DEVELOPMENT OF ENTREPRENEURSHIP	70	30	-	100	28	12	-
SKEG-T105 DIGITAL MARKETING E-COMMERCE AND E-PAYMENT							
SKEG-T108 HEALTH EDUCATION							
SKEG-T119 PERSONALITY DEVELOPMENT							
TOTAL MARKS	490	210	100	800	-	-	-
GRAND TOTAL	800				360		

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Scheme of Examination

B.C.A. Part III – Semester VI

COURSE	CREDITS	TOTAL HOURS	LECTURE HOURS PER WEEK	MIN. GRADE POINT OUT OF 10
CORE COURSE				
BCA – T 601 OPERATIONS RESEARCH	04	64	04	04
BCA – T 602 INTERNET AND WEB TECHNOLOGY USING PHP	04	64	04	04
BCA – P 602 PRACTICAL ON INTERNET AND WEB TECHNOLOGY USING PHP	02	32	04	04
BCA – T 603 COMPUTER GRAPHICS & MULTIMEDIA	03	48	03	04
BCA – P 603 PRACTICAL ON COMPUTER GRAPHICS & MULTIMEDIA	02	32	04	04
BCA – P 604 PROJECT WORK	03	48	06	04
ABILITY ENHANCEMENT COMPULSORY COURSE (AECC)				
BCA – T 605 PRINCIPLES AND PRACTICES OF MANAGEMENT	03	48	03	04
SKILL ENHANCEMENT / GENERIC COURSE - ANY ONE (SEC/GC)				
BCA – T 606 SKEG (ANY ONE)	SKILL ENHANCEMENT / GENERIC COURSE - ANY ONE (SEC/GC)			
SKEG-T103 COMMUNICATIVE ENGLISH	03	48	03	04
SKEG-T105 DIGITAL MARKETING E-COMMERCE AND E-PAYMENT				
SKEG-T107 FUNDAMENTAL OF BANKING & INSURANCE				
SKEG-T118 ORGANIC PRODUCT AND FARMING				
TOTAL	**24**	**384**	**31**	

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Scheme of Examination

B.C.A. Part III – Semester VI

Course	Max. Marks				Min. Marks		
	External Theory Examination	Internal Theory Examination	Practical Examination	TOTAL MARKS	External Theory Exam.	Internal Theory Exam.	Practical Marks
CORE COURSE							
BCA – T 601 OPERATIONS RESEARCH	70	30	-	100	28	12	-
BCA – T 602 INTERNET AND WEB TECHNOLOGY USING PHP	70	30	-	100	28	12	-
BCA – P 602 PRACTICAL ON INTERNET AND WEB TECHNOLOGY USING PHP	-	-	75	75	-	-	30
BCA – T 603 COMPUTER GRAPHICS & MULTIMEDIA	70	30	-	100	28	12	-
BCA – P 603 PRACTICAL ON COMPUTER GRAPHICS & MULTIMEDIA	-	-	75	75	-	-	30
BCA – P 604 PROJECT WORK	-	-	150	150	-	-	60
ABILITY ENHANCEMENT COMPULSORY COURSE (AECC)							
BCA – T 605 PRINCIPLES AND PRACTICES OF MANAGEMENT	70	30	-	100	28	12	-
SKILL ENHANCEMENT / GENERIC COURSE - ANY ONE (SEC/GC)							
BCA – T 606 SKEG (ANY ONE)	SKILL ENHANCEMENT / GENERIC COURSE - ANY ONE (SEC/GC)						
SKEG-T103 COMMUNICATIVE ENGLISH	70	30	-	100	28	12	-
SKEG-T105 DIGITAL MARKETING E-COMMERCE AND E-PAYMENT							
SKEG-T107 FUNDAMENTAL OF BANKING & INSURANCE							
SKEG-T118 ORGANIC PRODUCT AND FARMING							
TOTAL MARKS	350	150	300	800	-	-	-
GRAND TOTAL	800				360		

Scheme of Examination

Under CBCS System

- Under CBCS System every UG Course has been distributed in three parts namely – Core, Foundation and Elective. The subjects related to course are Core and are compulsory. In each semester Foundation Course is also compulsory. In each semester, the students have to opt one Elective Course from prescribed electives.
- The minimum credits for each course are 20 and maximum may be 24. The credits are finalized with the requirements of respective course.
- The total minimum credits for completing the Undergraduate course are **120** and for Honours **140**.
- For each course there will be 70% marks for External Examinations and 30% for Internal Examinations (CCE). The students have to clear both External and Internal Examinations separately.
- The pass marks in individual paper will be **40%** and in aggregate **45%**.
- The subject wise marks obtained by the student will be converted into prescribed 10 Point Grade Scale. The prescribed Grade Scale and related information are available in Examination Rules and for details follow or refer prescribed CBCS Guidelines.
- The students who are **awarded ATKT in two subjects** will be eligible to appear in the examination of next semester. However the student **will not be allowed** to appear in the next semester examination with more than **four ATKT at a time**.
- In case of more than two ATKT in a particular semester will be considered as fail in that semester and the student has to reappear in that particular semester examination.
- ATKT students have to follow the old syllabus but repeaters have to take the examination with the new syllabus.
- A student will have to compulsorily clear a program within **Five Academic Years** including the academic year of the admission, failing which he /she will not be allowed to continue the course. If a student doesn't clear all the semesters of the course in the above three years completely, then all his/ her previous result will be treated as null and void.
- Only those students who clear the program in one attempt and without gap will be eligible for position in the **Merit List**.
- A student who fails in aggregate is permitted to appear in **any one or two** papers of his/her choice to make up for the shortfall in the aggregate. Such a student can also appear in all the papers of that semester as an ex-student, provided the student applies for the same in the beginning of the semester.
- The students who are declared fail in aggregate will be eligible to appear in external theory examination of the corresponding papers only.
- Any point regarding the examination in the above scheme, which is not covered, will be applicable as per the examination scheme of respective course declared by the University or M.P. Government, whichever may be applicable, and the final decision in this regard will be taken by the Principal on the recommendation of Examination Committee.

Syllabus

B.C.A. Part III – Semester V

BCA – T501 – CORE COURSE I – COMPUTER NETWORKS

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per Week: 03 Hours **Total Lectures: 48**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Objective:	The course objective is to provide a general idea of data communications, networking, protocols, standard and networking model.
Course Outcomes:	It is expected that after completion of the course, students will able to
	➢ Independently understand basic computer technology.
	➢ Understand and explain Data Communication System and its components.
	➢ Identify the different types of network topologies and protocols.
	➢ Enumerate the layers of the OSI model and TCP/IP model .Explain the function(s) of each layer.
	➢ Identify the different network device and their function within a network.
	➢ Understand and building the skills of subnetting and routing mechanisms.
	➢ Get familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.

Unit-I	**10 Lectures**
Data communications and networking for Today's Enterprise, A communication model, Data communication, networking and Internet. Network model, need for a protocol architecture, The TCP/IP protocol architecture, The OSI model, Addressing. Data transmission: Concept and terminology, Analog and digital signals, Transmission impairment, Channel capacity.	
Unit-II	**08 Lectures**
Digital Transmission: Digital-to-digital conversion, Analog-to-digital conversion, Transmission mode. Analog transmission, Digital –to-analog conversion, Analog-to-digital conversion.	
Unit-III	**10 Lectures**
Bandwidth utilization: Frequency Division Multiplexing , Wavelength Division Multiplexing ,Synchronous and statistical Time Division Multiplexing , switching : Circuit switching ,Packet switching , Types of errors , framing (character and bit stuffing), error detection & correction method.	
Unit-IV	**10 Lectures**
Data Link Layer protocols, LAN Protocol Architecture, Bridges, Emergence of High –Speed LANs, Ethernet, Token Bus, Token Ring, Wireless LAN Technology (Wi -Fi). Routing in switched network: Routing in packet switched networks.	
Unit-V	**10 Lectures**
Internet and transport protocols: Principles of internetworking IPv4 & IPv6, Connection-oriented transport protocol mechanism, TCP and UDP. Network security: Encryption and Decryption techniques. Internet applications: E-mail. World Wide Web and HTTP.	

TEXT BOOKS :

(1) Data Communication and Networking, Behrouuz A.Forouzan, McGraw-Hill, 4th Ed.

(2) A. S. Tanenbaum –"Computer Network (4th Ed.) " – Pearson Education/PHI

REFERENCE BOOKS :

1) Computer Networking: James F . Kurore & Keith W. Rose, Pearson Education, Third Edition, 2005

2) Communication Networks: Fundamental Concepts and Key Architecture: Albert Leon –Gracia and Indra Widjaja, Tata McGraw-Hill Publishing Company Limited, ISBN 0-07-0402235-3

3) Data and Communication: Michael A. Miller, Delmar Thomson Learning inc ISBN0-07668-1100-X

4) Introduction to Computer Networks: Douglas E. Comer, Prentice-Hall, Alberto Leon – Gracia and Indra Widjaja, Communication Networks- Fundamentals

5) Concepts and Key Architecture, Tata McGraw-Hill Publishing Company Limited ISBN

Syllabus

B.C.A. Part III – Semester V

BCA – T502 – CORE COURSE II – INTRODUCTION TO CLOUD COMPUTING

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per Week: 03 Hours **Total Lectures: 48**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Objective:	The Course Objective is to provide comprehensive knowledge of the Cloud Computing, Fundamental Issues, Technologies applications and implementation security aspects.
Course Outcomes:	It is expected that after completion of the course, students will able to
	➢ Understood the core business of cloud computing such a security, privacy and interoperability.
	➢ Identify problems and explain, analyze and evaluate various cloud computing solution.

Unit-I	**08 Lectures**
Introduction to cloud computing, history, importance of cloud computing in the current era, characteristic of cloud computing, what cloud computing really is and isn't, pros and cons of cloud computing, technologies in cloud computing, migrating into cloud.	
Unit-II	**10 Lectures**
Types of clouds, cloud infrastructure, cloud application architecture, working of cloud computing, trends in cloud computing, cloud service models, cloud deployment models, cloud computing and services pros and cons.	
Unit-III	**10 Lectures**
Cloud computing technology, cloud life cycle model, role of cloud modeling and architecture, cloud system architecture, virtualization, type of visualizations, importance and limitations of various type of visualizations, virtualization in cloud computing.	
Unit-IV	**10 Lectures**
Data storage, introduction to enterprise data storage, data storage management, file system, cloud data stores, cloud storage characteristics, application utilizing cloud storage.	
Unit-V	**10 Lectures**
Introduction to Web services, cloud services deployment tool, management / administrative services, risk management in cloud computing, introduction to Apache Hadoop.	

TEXT BOOK:

(1) Cloud computing a practical approach for learning and implementation first edition Pearson A. Srinivasan, J. Suresh

REFERENCE BOOKS:

1) Cloud Computing Bible: Berrie Sosinsky, Wiley- India 2010.
2) Cloud Computing Principle and Paradigm, Editors : Rajkumar buyya, James Broberg, Andrzej Goscinski, Wiley Publications, 2011
3) Cloud Computing : Principle systems and applications: Editor Nikos Antonopoulos, Lee Gillam, Spinger 2012
4) Cloud security: Comprehensive guide to secure cloud computing , Ronald L. Kurtz, Russell Dean Vines Wiley-India 2010

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B.C.A. Part III – Semester V

BCA – P502 – CORE COURSE II –

PRACTICAL ON COMPUTER NETWORKS AND CLOUD COMPUTING

MAX.MARKS: 50 **MIN. PASS MARKS: 20**

No. of Lectures per Week: 04 Hours **Total Lectures: 64**

1) Familiarization with Networking Components and devices: LAN Adapters, Huns, Switches, Routers etc.
2) Familiarization with Transmission media and Tools: Co-axial cable, UTP Cable, Connectors etc., Preparing straight and cross cables.
3) Study of various LAN topologies and their creation using network devices, cables and computers.
4) How to make a network cabling connection.
5) How to Create a Local Area Network (LAN)
6) Network Protocol-Types of Network Protocols.
7) Network maintenance Troubleshooting.
8) Steps for installing Proxy Server on Windows.
9) Procedure to create a network (LAN).
10) Procedure to share hardware resources (printer) over network.
11) Trouble shooting tools in Data Communication.
12) Implementation of file and printer sharing.
13) Network Cable Connectors Types and Specifications.
14) Case Study on IEEE Standard 802.3, 802.4 and 802.5.
15) Case Study on DNS, TELNET, FTP.
16) Virtualization in cloud using any freeware Tool.
17) Installing Operating System on virtual computer.
18) Using existing cloud services like SAAS, PAAS, IAAS, Cloud Storage.

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B.C.A. Part III – Semester V

BCA – T503 – CORE COURSE III – INTRODUCTION TO DATA SCIENCE

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per Week: 03 Hours **Total Lectures: 48**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Objective:	The objective of the course is to introduce and teach idea of Data Science and enable students to apply Data Science in real world. This course will help learning from data, in order to gain useful predictions and business decisions.
Course Outcomes:	It is expected that after completion of the course, students will able to
	➢ Learn the fundamentals of Data Science.
	➢ Work with R to analyze structured and unstructured data.
	➢ Develop the ability to build and assess data-based models.
	➢ Predict outcomes with supervised and unsupervised machine learning techniques.

Unit-I	**08 Lectures**
Introduction: What is Data Science? The Data Science Process, Different Types of Data: Quantitative, Categorical. Graphical Summaries of Data: Pie Chart, Bar Graph, Pareto Chart. Histogram. Measuring the Centre of Quantitative Data: Mean, Median, Mode. Measuring the Variability of Quantitative Data: Range, Standard Deviation, and Variance.	
Unit-II	**10 Lectures**
Overview of R, R data types: Vectors, Matrices, Factors, Lists, Data Frames, reading and writing data, Control structures, functions, scoping rules, dates and times.	
Unit-III	**10 Lectures**
Introduction to Data Cleansing, Missing and Repeated Values, Feature Engineering, Outliers and Errors, **Finding** Outliers, Cleaning Data with R.	
Unit-IV	**10 Lectures**
Machine Learning: Definition and overview, Regression, Simple Linear Regression, Multiple Regression, Assessing Performance, Ridge Regression, Feature Selection & Lasso, Nearest Neighbours & Kernel Regression.	
Unit-V	**10 Lectures**
Machine Leaning: Classification, Linear Classifiers &Logistic Regression, Learning Linear Classifiers, Overfitting & Regularization in Logistic Regression, Decision Trees, Handling Missing Data, Boosting.	

TEXT BOOKS:

1) Allan G. Bluman, Elementary statistics: A step by step Approach, 10th Edition MeGraw-Hill, 2017.
2) Paul Tector, R Cook Book, First edition, O Reilly Media, 2011.
3) Tom Mitchell , Machine Learning , First edition MeGraw-Hill,1997.

REFERENCE BOOKS:

1. Software Engineering by Roger S. Pressman, Mc- Graw Hill.
2. An Integrated Approach to Software Engineering Pankaj Jalote, Nakoda Publication House

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B.C.A. Part III – Semester V

BCA – P503 – CORE COURSE III – PRACTICAL ON DATA SCIENCE USING R

MAX.MARKS: 50 **MIN. PASS MARKS: 20**

No. of Lectures per Week: 04 Hours **Total Lectures: 64**

1) Write a R program to take input from the user (name and age) and display the values, Also print the version of R installation.
2) Write a R program to get the details of the objects in memory.
3) Write a R program to create a sequence of numbers from 20 to 50 and find the mean of numbers from 20 to 60 and sum of numbers from 51 to 91.
4) Write a R program to create a vector which contains 10 random integer values between -50 and +50.
5) Write a R program to get the first 10 Fibonacci numbers.
6) Load the built in warp breaks data set. Find out, in a single command, which columns of warphreaks are either numeric or integer.
7) a. Load the state datasets.
   b. Convert the state.x77 dataset to a data frame.
   c. Rename the Life *Exp* variable to*Life.Exp*, and s Grad to *HS.Grad*
8) Suppose we wanted to enter all the variables in a first-order linear regression model with Life Expectancy as the dependent variable, Fit this model.
9) Suppose we wanted to remove the Income, 1lliteracy, and Area variables from the model in Exercise 2. Use the update function to fit this model.
10) Let's assume that we have settled on a model that has *HS.Grad* and Murder as predictors. Fit this model.
11) Write a R program to create a Data Frames which contain details of 5 employees and display summary of the data.
12) Write a R program to create the system's idea of the current date with and without time.
13) To prepare data for analysis in R
14) To find missing data in R?
15) To exclude missing data in R?
16) To remove rows with 0 in R?
17) Create a list of 80% of the rows in the original dataset to use for training.
18) Select 20% of the data for validation.
19) Use the remaining 80% of data of train and test the models.
20) Find the dimensions of the "iris" dataset.
21) Find the type of each attribute in your database.
22) Take a look at the first 5 rows of your dataset.
23) Display the summary of the "iris" databases
24) What happens to missing values in a histogram? What happens to missing values in a bar chart? Why is there a difference?

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B.C.A. Part III – Semester V

BCA – T504 – CORE COURSE IV – MATHEMATICS-V - LINEAR ALGEBRA AND GEOMETRY

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per Week : 03 Hours **Total Lectures: 48**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Objective:	To introduce the concept of Linear Algebra & Geometry which build strong foundation of students in many of Computer Science including graphics, image processing, Cryptography, machine learning, computer vision, Optimization, graph algorithm, quantum computation, information retrieval and web-search. Analytical Geometry is very important for computer graphics, computer games, game designing, animation and cartography.
Course Outcomes:	It is expected that after completion of the course, students will able to
	➢ Vector Space and Linear Maps which help in the image processing.
	➢ Concepts of Eigen Vectors and Eigen Value and that have many important applications in computer vision and machine learning.
	➢ Group Theory which plays a vital role in applications of Cryptography.
	➢ Parabolic and ellipsoidal surfaces which helps in computer graphics.
	➢ Cone and cylindrical surfaces which helps in cartography and animation.

Unit-I	**08 Lectures**
Groups, Definition, Order of an element. Subgroups; Definition, Necessary and Sufficient Condition. Coset Decomposition, Right and Left Cosets, Lagrange's Theorem. Definitions and Basics of Normal Subgroups, Quotient Group, Homomorphism and Isomorphism of groups, Kernel of Homomorphism.	
Unit-II	**10 Lectures**
Vector Spaces, Vector Space, Subspace and Quotient Space, Linearly Dependent and, Independent Vectors, Linear Maps. Definition and properties. Homomorphism and Isomorphism of Vectors spaces, Kernel of a Linear Map.	
Unit-III	**10 Lectures**
Matrix Representation of a Linear Map. Rank and Nullity of Linear Map. Fundamental Theorem of Vector Space Homomorphism. Eigen Values and Eigen vector of Matrix, Cayley Hamilton Theorem: Proof and Applications.	
Unit-IV	**10 Lectures**
Parabolic, definition and description, Elliptical and Hyperbolic Paraboloid, Parabolic of revolution. Tangent planes and Normal to a Parabolic. The Ellipsoid, Tangent & Normal Plane to it. Director sphere of an ellipsoid, conjugate diameters and diametrical planes to ellipsoid. Locus of chords.	
Unit-V	**10 Lectures**
The Definition and description. Finding Equation of Cone, Standard Equation and Condition of General Quadratic Equation representing Cone. Angle Between two Generators, Cone of conicoid, right circular Cone. The cylinder definition, equation right circular Cylinder, enveloping cylinder to a conicoid.	

TEXT BOOKS:

(1) I.N. Herstein ,Linear Algebra, Wiley Publisher

(2) P.K. Jain ,Analytical Geometry of Three Dimensions , New Age International Publisher.

REFERENCE BOOKS:

(1) Seymour Lipschutz & Mark Lipson ,Linear Algebra Schaum's Series , Mc-Graw Hill Publisher.

(2) P.N. Chatterjee ,Solid Geometry , Ram Prasad & Sons Publisher Bhopal.

(3) D.C. Agrawal ,Coordinate Geometry of Three Dimensions Shree Sai Prakashan Meerut.

(4) S.N. Goel ,Linear ALGEBRA, Kedarnath Ramnath Publication , Meerut.

(5) Kenneth Hoffman and Ray Kunze ,Linear Algebra ,Prentice Hall of India Pvt. Ltd. New Delhi.

(6) P.N. Chatterjee ,Solid Geometry Ram Prasad & Sons Publisher Bhopal.

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B.C.A. Part III – Semester V

BCA – T505 – CORE COURSE V – INFORMATION TECHNOLOGY TRENDS

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per Week: 03 Hours **Total Lectures: 48**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Objective:	To make aware students the changes in technologies, applications and systems around us.
Course Outcomes:	It is expected that after completion of the course, students will able to
	➢ Get knowledge about modern communication systems.
	➢ Be familiarized with concept of Mobile Commerce and Geographic Information system.
	➢ Understand the concept of data warehouse, data mining and Big Data.
	➢ Understand the use of Artificial Intelligence and Iot in current context.

Unit-I	**10 Lectures**
Introduction and basic concepts of modern communication and telephony technology: CDMA, WLL, GSM, VOIP, Blue-tooth, Wi-Fi. **Communication Technology:** 2G, 3G, 4G, 5G. Communication over Radio, Microwave systems, Communication satellites, Radar, Fiber optics, ISDN- their properties. **Geographic Information system (GIS):** Components of a GIS -Hardware, Software, Data, People, Methods, Working and applications of GIS.	
Unit-II	**10 Lectures**
Information Security – Introduction, Malicious Programs, Cryptography, Digital Signature, Firewall, User Identification and Authentication, Security Awareness and Policies, Application areas requiring security. Mobile Commerce: Introduction, Growth, Success stories of Mobile commerce, Technologies for mobile commerce, M-Commerce in India, Digital Marketing.	
Unit-III	**10 Lectures**
Data Warehouse and Data Marts: Introduction, Advantages of data warehouse, Data warehouse components, Data warehouse architecture and schemas, Big Data Concept. **Data Mining:** Introduction, Evolution of data mining, Data mining —verification versus discovery, Advantages of data mining, Technologies used in data mining.	
Unit-IV	**08 Lectures**
Artificial Intelligence and Expert system: Concepts of Artificial Intelligence & Expert System, Building of Expert system, Merits and Demerits of Expert system, Application of Expert system. Application of Artificial Intelligence.	
Unit-V	**10 Lectures**
Introduction to IoT: Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Home automation, Industry applications, Surveillance and other IoT applications. **Introduction to virtual reality:** Definition, Applications of VR, Smart Systems, Embedded systems.	

TEXT BOOKS:

1. Fundamentals of Information Technology by Alex Leon & M. Leon, Vikas Publications, New Delhi.
2. Frontiers of Electronic Commerce, by Ravi Kalakota, Andrew B. Whinston, Addison Wesley Longman Publishing.
3. E-Commerce: An Indian Perspective (Second Edition) by S.J.P.T. Joseph, S.J. Prentice-Hall of India Pvt. Ltd.
4. Security in Computing (Third Edition) by C.P. Pfleeger, S. L. Pfleeger, D.N. Shah, S. Ware, Prentice Hall 2002.
5. Mobile communications, Joschen Schiller, Pearson Education.
6. Recent Magazines of Computers and Communication.
7. Cloud Computing PHI by Rao M. N.
8. Internet of Things McGrawHill by Raj Kamal.

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B.C.A. Part III – Semester V

BCA – T505 – CORE COURSE V – INFORMATION TECHNOLOGY TRENDS

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per Week: 03 Hours **Total Lectures: 48**

REFERENCE BOOKS:

1. Introduction to Information Technology – ITL Educations Solutions Ltd., Seventh Impression, Pearson Education, 2008.
2. Data Mining Techniques – Arun K Pujari, University Press.
3. Enterprise Resource Planning 1/e - Alex Leon, International Edition- Tata McGraw Hill publication.
4. Concepts in computing – Kenneth Hoganson, FirstIndian Edition, Jones & Bartlett Publishers, Inc., 2010.
5. Artificial Intelligence – Elaine Rich, Kevin Knight, 2nd edition, McGraw Hill, 1991.
6. Computer Networks – Andrew S. Tanenbaum, 4th Edition, Pearson Education.

CHRISTIAN EMINENT COLLEGE, INDORE

(Academy of Management, Professional Education & Research)

An Autonomous Institution Established in 1996

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2022-23

Syllabus

B.C.A. Part III – Semester V

BCA – T506 – ABILITY ENHANCEMENT COMPULSORY COURSE (AECC) –

HUMAN VALUES AND PROFESSIONAL ETHICS

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per week : 02 Hour **Total Lectures: 32**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Objective:	The objective of the course is to disseminate the theory and practice of moral code of conduct and familiarize the students with the concept of "right" and "virtuous" in individual, social and professional context.
Course Outcomes:	It is expected that after completion of the course, students will able to
	➢ Understand ethical philosophies, principles, models that directly and indirectly affect business.
	➢ Learn the importance of the ethics and moral values.

Unit-I	**06 Lectures**
Human Values; Types, Features and Classification, Source of Value System, Values across Cultures.	
Unit-II	**06 Lectures**
Morality Norms, Beliefs, Attitude Moral Norms, Moral Values, Moral Standards.	
Unit-III	**07 Lectures**
Professional Ethics; Nature, Characteristics and Needs, Ethics V/s Morals and Values Ethico-Moral Action, Ethical Codes, Ethical Practices.	
Unit-IV	**07 Lectures**
Nature and Dimensions of Attitude Components of Attitude, Attitude Formation, Functions of Attitude, Changing Attitude.	
Unit-V	**06 Lectures**
Moral Values and Character-Building Character; Meaning, Important Components of Character, Character Development.	

TEXT BOOKS:

1) Beteille Andre (1991), Society and Politics in India, Athlone Press, Latest edition.
2) Chakraborty S. K. (1999), Values and Ethics for Organizations, Oxford University Press, Latest Edition.
3) Fernando, A. C. (2009), Business Ethics – An Indian Perspective, Pearson Education, India, Latest Edition

REFERENCE BOOKS:

1) Charles D. Fieddermann (2012), "Engineering Ethics", Pearson Education / Prentice Hall, New Jersey, (Indian Reprint), Latest Edition.
2) Boatright Johan R (2012), "Ethics and the Conduct of Business". Pearson Education, New Delhi, Latest Edition.
3) Crane, Andrew and Matten Dirk (2015), Business Ethics, Oxford University Press Inc., New York, Latest Edition.

Syllabus

B.C.A. Part III – Semester V

BCA - 507 (SKEG) – SKILL ENHANCEMENT / GENERIC COURSE - ANY ONE (SEC / GC) –

SKEG- T104 – ENTREPRENEURSHIP

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per week : 03 Hours **Total Lectures: 48**

SKEG-T105 – DIGITAL MARKETING E-COMMERCE AND E-PAYMENT

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per week : 03 Hours **Total Lectures: 48**

SKEG- T-119 – PERSONALITY DEVELOPMENT

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per week: 03 Hours **Total Lectures: 48**

SKEG-T108 – HEALTH EDUCATION

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per week : 03 Hours **Total Lectures: 48**

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B.C.A. Part III – Semester VI

BCA – T601 – CORE COURSE I – OPERATIONS RESEARCH

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per Week: 04Hours **Total Lectures: 64**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Objective:	To analyze different situations in the industrial, business scenario involving limited resources and finding the optimal solution within constraints.
Course Outcomes:	It is expected that after completion of the course, students will able to
	➢ Identify and develop operational research models from the verbal description of the real system.
	➢ Analyze the different operation research models that are needed to sol\'c optimization problems.
	➢ Understand the mathematical tools hell arc needed to solution of business problem.
	➢ Formulate and solve the problemsas network and graphs.
	➢ Use CPM and PERT techniques to plan, schedule and control project activities.
	➢ Apply analytical skills and problem-solving tools Lo the analysis of the operationsproblems.

Unit-I	**14 Lectures**
Introduction to Operations Research: Origin and Development of OR, Nature of OR. Characteristics of OR, Meaning, Scope of Operations Research and Decision making. Advantages and Limitations of OR, Application of OR, Phases of OR, OR Models.	
Unit-II	**16 Lectures**
Linear Programming: Meaning of Linear Programming, Mathematical Formulation of Linear Programming Problems, Graphical Solution. Simplex Method. Dual Simplex, Advantages and limitations of LPP.	
Unit-III	**12 Lectures**
Transportation Problems: Mathematical Model and Formulation. Initial Basic Feasible Solution, North West Corner Method, Least Cost Method, Vogel 's Approximation Method, Optimal Solution (Minimization And Maximization) using Modified Distribution Method, Degeneracy in Transportation Problem,	
Unit-IV	**12 Lectures**
Assignment Problems: Definition of Assignment Problem, Comparison with Transportation Problem. Formulation and solution of Assignment Problem using Hungerian method (Minimization And Maximization). Travelling Salesman Problem.	
Unit-V	**10 Lectures**
Sequencing and Scheduling: Johnson Algorithm for processing n jobs through machines. Algorithm for processing n jobs through 3 or more machines. Processing *jobs-*; through n machine.	

TEXT BOOKS:

1. Cillct B. L.. Introduction to Operation Research. Computer Oriented Algorithmic Approach. l ala McGraw Hill publishing Co. Ltd., New Delhi.
2. P.K. Gupta & D.S. Hira, Operations Research, S. Chand & Co.

REFERENCE BOOKS:

1. !'aha I I.A, Operations Research : A Introduction, Mc Millian Co., New York.
2. i.S. Kambo, Mathematical Programming Techniques, Affiliated East West Press Pvt. Ltd., Ne\\' Del hi, 198—L.
3. R. Panneserlvam, Operations Research. Prentice Hall of India Pvt. Ltd., New Delhi. 2004.
4. Sharma, Operations Research, Kedar Nath & Co. Meerut.
5. Giupta. Kanti Swaroop. Gupta P.K. and mohan, Operations Research, Sultan Chand and Sons. New Delhi.

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B.C.A. Part III – Semester VI

BCA – T602 – CORE COURSE II - INTERNET AND WEB TECHNOLOGY USING PHP

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per Week: 04 Hours **Total Lectures: 64**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Objective:	The course objective is to understand the principles of creating an effective web page using HTML, CSS and the concepts on web designing and development using PHP and MySQL.
Course Outcomes:	It is expected that after completion of the course, students will able to
	➢ Develop an understanding about the basic concepts of Web page design using HTML and CSS.
	➢ Develop an understanding about the web site development using PHP.
	➢ Create powerful and dynamic web applications using PHP and MySQL.
	➢ Build a simple, yet functional web application using PHP.

Unit-I **12 Lectures**

Web Technology: Introduction to WWW, web browsers, web servers, HTTP, URL.
HTML: Introduction, Objective, HTML Command Tags: Text, List, Table, creation of links, inserting graphics, forms.
Cascading style sheets: Introduction to CSS

Unit-II **14 Lectures**

A Brief History of PHP, PHP Characteristics, Installing and Configuring PHP on Windows, PHP Language Basics: Lexical Structure, Data Types, Variables, Expressions and Operators, Decision Statements, Flow Control Statements, Embedding PHP in Web Pages.
Strings: String Constants, Printing Strings, Accessing Individual Characters **String Handling Functions:** length, Word count, string position, reverse, replace.
Math: max min , sqrt sin ,cos, tan sinh , cosh, tanh , abs ,count ,ccil, round , floor , log , log10, pow() function.
Arrays: Indexed Arrays, Associative Arrays, Identifying Elements of an Array, Storing Data in Arrays, Multidimensional Arrays, extracting multiple values, converting between arrays and variables, Traversing Arrays.

Unit-III **14 Lectures**

Session : Session handling, creating session , storing values in session, accessing, values from session, destroying session .
Cookies: creating cooking, setting values, accessing cookies values, session cookie, persistent cookie, redirecting page.
Functions: Calling a Function, Defining a Function, Variable Scope, Function Parameters, Return Values, Variable Functions.
Object Oriented Programming Concepts: Classes, Objects, Member Functions, Encapsulations, Inheritance, and Polymorphism. (only basic definitions of these topics)

Unit-IV **12 Lectures**

Form Handling in PHP:
Setting Up Web Pages to Communicate with PHP, Handling Text Fields, Text Areas, Check Boxes, Radio Buttons, Submit , Reset, Button , Select Box , input type , email , password , date and url.
File Handling: Working with files ; File Open and Read , File create and Write, Reading and writing Character in file, reading entire file , Rename and Delete File , File Uploading.

Unit-V **12 Lectures**

Database Access: Using PHP to access a database. Introduction to MySql, connectivity with MySql.
Creating form and saving data of form to MySql. Performing CRUD operation using PHP and MySql.

Text Books:

1. Programming PHP, Rasmus Lerdorf and Kevin Tatroe , O'Reilly Publication
2. Beginning PHP 5, Wrox Publication.
3. Mastering PHP, BPB Publication.
4. .PHP 5.1 for beginners by Evan Bayross and Sharman Shah, SPD Publications.
5. PHP 5.2 The Complete Reference by Steven Holzner, Mc Graw Hill Edition 2008

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B.C.A. Part III – Semester VI

BCA-P602 PRACTICAL ON INTERNET AND WEB TECHNOLOGY USING PHP

MAX.MARKS: 50 **MIN. PASS MARKS: 20**

No. of Lectures per Week: 04 Hours **Total Lectures: 64**

1) Write down html code to design navigation menu for home, about us, contact us, registration and login page. Link all of them too.
2) Write down html code to list unordered list of items and link each item to another page which will show detail about them.
3) Write down html code to design 4 sections using div tags. Each section will show image, link, ordered list and an image which is a link to another html page respectively.
4) Write down html code to design 5 sections using table tags.
5) Write down html code to design a registration form like facebook.com using div.
6) Write down html code to design registration form in four steps.
7) Write down html code to design login form- like Gmail.
8) Write down html code to design a bill. The bill should contain date of invoice, different items, quantity, price of single item and total price.
9) WAP to print hello world using php .
10) WAP to print Character, Boolean, Integer and Floating values using single variable.
11) WAP to reverse a string using strrev function
12) WAP to demonstrate strlen, strstr, strpos, stripos, stristr functions.
13) WAP to search a string within string.
14) WAP to sum of all digits of number.
15) WAP to print pattern like

    1
    12
    1 2 3
    1 2 3 4

16) WAP to print pattern like

    *
    **
    ***
    ****

17) WAP to demonstrate sin, cos, tan, sink, cosh, tank, sort, abs, pow, max and min functions.
18) WAP to create an array of character and reverse the characters in array.
19) WAP to create an array of item price and print maximum price.
20) WAP to create array of strings and calculate length of each string.
21) WAP to break a string using explode function with ibllowing comma, white space and dollar symbol. After breaking store all in an array.
22) WAP for matrix multiplication.
23) WAP for storing and displaying student roll no and marks in associative array.
24) WAP to create user defined function to print hello world.
25) WAP to create user defined function to reverse the string.

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B.C.A. Part III – Semester VI

BCA-P602 PRACTICAL ON INTERNET AND WEB TECHNOLOGY USING PHP

MAX.MARKS: 50 **MIN. PASS MARKS: 20**

No. of Lectures per Week: 04 Hours **Total Lectures: 64**

26) WAP to create user defined function to swap value of two variables.
27) WAP to create a function to find out maximum of four numbers.
28) WAP to create class to show use of class.
29) WAP to create class, in which one function will set variable like name, id and salary. Another function will be called to show all these details.
30) WAP to create a class which will have function for area. The second class will inherit it and override the function area.
31) WAP print maximum of three numbers accepted from user.
32) WAP to print average of 5 numbers. Input will be taken from the user using form tag.
33) WAP to take username, address, phone number and date of birth from user and then print them all on html page using PHP code in page design using html.
34) WAP to accept the name of user from html form and check its length. It the length is less than 7 or greater than 14, redirect it to same page and print the error message; if name is hen length take page to another page and print welcome message.

361 WAP to create session using set some value in session like name and print the name on another page using session.

37) WAP to store username in session, take input from user, redirect to another page and print username from session.
38) WAP to take username and password. Check it in database. If record is found, then user will redirect to home page and on home page all details will be displayed. Following options should be there -- edit profile, change password, logout, user session to store user naive and check them on each page. If session expires, user will be directed to another page-
39) WAP to create cookie to store a name.
40) WAP to access cookie data and display them.
41) WA P to create "keep me signed in" as in gmail and yahoo.
42) WAP to create session cookie.
43) WAP to create persistent cookie.
44) WAP to create a file and store user details entered by user with the help of form.
45) WAP to print information of the file. The file name will be given by the user.
46) WAP to copy contents of one file to another file.
47) WAP to connect MySql database using PDO and MySQLI connection object.
48) WAP to create longing with MySql database. User will enter username and password. SQL command which will take username and password and check with database table. IF record is found all details of user will be displayed
49) WAP to create Signup form and store all user information in database. Cheek that no duplicate username will be stored.
50) WAP to display all user data store in database table.
51) WAP to edit user record by selecting a user from list all of user.

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B.C.A. Part III – Semester VI

BCA – T603 – CORE COURSE III – COMPUTER GRAPHICS & MULTIMEDIA

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per Week: 03 Hours **Total Lectures: 48**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Objective:	The objective of the course is to provide compressive introduction about computer graphics system. design a1gonttlmst 2D transformations. Techniques of clipping. 3-D graphics and 3-D transformations.
Course Outcomes:	It is expected that after completion of the course, students will able to
	➢ Learn the basic concepts of computer graphics.
	➢ Implement various algorithms to scan. Convert the basic geometrical primitives, transformations, Area filling, clipping
	➢ Create 2D animations using tools.
	➢ Create 3D graphical scenes using open graphics library suits.
	➢ [Implement image manipulation and enhancement.
	➢ Learn fundamentals of animation and its related technologies.

Unit-I	**10 Lectures**
Introduction: Introduction to Computer Graphics, Application of Computer Graphics, Display Devices: Refresh Cathode - Ray Tubes, Raster Scan Displays, Random Scan Displays, Color CRT Monitors, Flat Panel Displays. Video cards/display cards. Input Devices: Mouse, Trackball, Space ball, Data Glove, Joystick, Light pen, Scanner, Digital Camera, Touch Panels, Voice Systems. Hardcopy Devices: Printers and Plotters.	
Unit-II	**10 Lectures**
Graphics Primitives: Line Generation Algorithms: DDA algorithm, Bresenham's algorithm. Circle Generation Algorithms: Midpoint Circle algorithm, Bresenham's circle generation algorithm. Displaying Lines, Characters and Polygon. Polygon filling Algorithms: Scan Line Polygon fill algorithm, Inside - Outside Tests, Boundary-Fill algorithm, Flood -Fill algorithm. Fundamentals of aliasing and Ant aliasing Technique.	
Unit-III	**10 Lectures**
Clipping: Clipping operations, Point clipping, Line clipping: Cohen Sutherland Algorithm, Liang Barsky Algorithm, Nicholl-Lee-Nicholl Algorithm. Polygon clipping: Sutherland- Hodgeman Algorithm, Weiler Atherton Algorithm. Text clipping, Exterior Clipping.	
Unit-IV	**10 Lectures**
Two Dimensional Transformations: Translation, Scaling, Rotation, Reflection, Shear, Homogenous coordinate system, composite transformations, raster method of transformation, Two Dimensional Viewing: Window to View port coordinate transformation.	
Unit-V	**08 Lectures**
Multimedia : Introduction, Multimedia Application, Multimedia data and file formats, Multimedia Tools Advancements in the technology in Computer Graphics & Multimedia.	

TEXT BOOK:

1) Donald Hearn and M. Pauline Baker, Computer Graphics: C Version, Second Edition, Prentice Hall of India.
2) Tay Vatighan, Multimedia Making it Works, Seventh Edition, , Tata Mc-Graw-Hill, New Dehli

REFERENCE BOOKS:

1) David F. Rogers, Procedural Elements for Computer Graphics, Tata Mc-Graw-Hill Publishing Comp. Ltd., New Dehli, 2001.
2) James D. Foley, Andries van Dam, Steven K. Feiner, John F. Hughes, Computer Graphics: Principles and Practice in C, Second Edition, Addison- Wesley Professional.
3) Zhigang Xiang, Roy A. Plastock, Schaum's outline of Theory and Problems of Computer Graphics, Second Edition, Tata Mc-Graw-Hill, New Dehli

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B.C.A. Part III – Semester VI

BCA-P603 PRACTICAL ON COMPUTER GRAPHICS & MULTIMEDIA

MAX.MARKS: 50 **MIN. PASS MARKS: 20**

No. of Lectures per Week: 04 Hours **Total Lectures: 64**

1. Write a Program to draw basic graphics construction like line, circle, arc, ellipse and rectangle.
2. Write a program to draw a Circle using Midpoint implementation Method.
3. Write a program to draw a Line using DDA algorithm
4. Write a program to draw a Line using Bresenham's algorithm.
5. Write a program to draw a Circle using Bresenham's algorithm.
6. Write a program draw Midpoint Ellipse drawing
7. Write a program to perform Scaling Transformation.
8. Write a program to perform Translation Transformation.
9. Write a program to rotate a triangle.
10. Write a program for line clipping using Cohen Sutherland algorithm.
11. Write a program for line clipping using Liang Barskey algorithm.
12. Write a program for polygon filling using Boundary Fill algorithm.
13. Write a program for polygon filling using Seed Fill algorithm.
14. Write a program for polygon filling using Scan Line algorithm.
15. Write a program to draw a digital clock.
16. Write a program to draw a flying bird.
17. Write a program to generate various texts.
18. Write a program to demonstrate reflection effects.
19. Write a program to find visibility of line.
20. Write a program for screen saver.

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B.C.A. Part III – Semester VI

BCA – P604 – CORE COURSE IV – PROJECT WORK

MAX. MARKS: 150 **MIN. PASS MARKS: 60**

No. of Lectures per Week: 06 Hours **Total Lectures: 96**

The students are expected to work on a project. The student can formulate a project problem with the help of his/her Guide and submit the project proposal. If approved, the student can commence working on it and complete it.

MARKS DISTRIBUTION:
Project / Project Report: 60
Project Presentation / Demonstration: 50
Projcet Viva-Voce: 40

Project Report Guidelines

I	**Introduction**	Project Introduction Existing System with limitations Proposed System with Aim and Objectives Preliminary Investigation Feasibility Study Software/ Hardware Requirements
II	**System Analysis**	Functional and non-functional Requirements System Flowcharts Data Flow Diagram E-R Diagrams
III	**System Design**	Architectural Design File / Database Design Normalization User Interface Design
IV	**Coding**	
V	**System Testing**	Testing techniques and Testing Strategies Used Testing Plan Used Test Reports for Unit Test Cases and System Test Cases
VI	**Conclusions**	
VII	**Bibliography**	
VIII	**Appendices (If Any)**	

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B.C.A. Part III – Semester VI

BCA – T605 – ABILITY ENHANCEMENT COMPULSORY COURSE (AECC) –

PRINCIPLES AND PRACTICES OF MANAGEMENT

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per Week: 03 Hours **Total Lectures: 48**

The Question Paper will contain questions equally distributed in all Units. The Internal Choice will be given in all Questions.

Course Objective:	The course aims to help the students to be aware of the primary functions & responsibilities of managers, and understand the environment of an organization.
Course Outcomes:	It is expected that after completion of the course, students will able to
	➢ Understand the concepts related to Business.
	➢ Understand the roles, skills and functions of management.
	➢ Understand the complexities associated with the management of resources in the organization.

Unit-I	**08 Lectures**
Management: Definition, Nature and Importance. Role **and** Functions of Manager, General and Scientific Principles of Management, Human Relations School of Management. Behavioral & System Approach.	
Unit-II	**10 Lectures**
Planning: Nature and Purpose of Planning, Process of Planning, Components of Planning, Management by Objectives, Forecasting, Decision Making: Concepts, Nature & Process of Decision Making.	
Unit-III	**10 Lectures**
Organizing: Nature and Purpose of Organizing, Structure of Organization: Line and Staff Structure Departmentation, Delegation of Authority, Centralization & Decentralization.	
Unit-IV	**10 Lectures**
Directing: Concept & Nature. Principles of Direction, Process of Directing. Problems in Human Relation, Strategies for Establishing Healthy Human Relations.	
Unit-V	**10 Lectures**
Control: Meaning and Process of Control, Need of Control in Organization, Control Techniques. Levels & Areas of Control.	

TEXT BOOK:

1. Principles of Management: Harold Koontz, O'Donnel and Heinz Welhrich New York: McGraw Hill Book Co

REFERENCE BOOKS:

1. Stoner, Freeman and Gilbert Jr., "Management", PHI, 6th Ed.
2. Organization and Management Concepts : R.D. Agarwal, New Dehli, Tata McGraw Hill. 1995
3. Robbins and Coulter, "Management", PHI, 8th Ed.
4. Robbins S. P. and Decenzo David, "A. - Fundamentals of Management: Essential Concepts and Applications", Pearson Education, 5th Ed.
5. Hillier Frederick S. and Hillier Mark S. - Introduction to Management Science: A Modeling and Case Studies Approach with Spreadsheets, Tata Mc Graw Hill, 2nd Ed., 2008.
6. Dr. G. S. Sudha : प्रबंध अवधारणा एवं संगठनात्मक व्यवहार

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B.C.A. Part III – Semester VI

BCA -606 (SKEG) – SKILL ENHANCEMENT / GENERIC COURSE - ANY ONE (SEC / GC) –

SKEG- T118– ORGANIC PRODUCT AND FARMING

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per week : 03 Hours **Total Lectures: 48**

SKEG-T103 – COMMUNICATIVE ENGLISH

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per week : 03 Hours **Total Lectures: 48**

SKEG- T107 – FUNDAMENTAL OF BANKING & INSURANCE

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per week: 03 Hours **Total Lectures: 48**

SKEG-T108 – HEALTH EDUCATION

MAX. MARKS: 70 + 30 **MIN. PASS MARKS: 28 + 12**

No. of Lectures per week : 03 Hours **Total Lectures: 48**
