

**HIRACHAND NEMCHAND COLLEGE OF COMMERCE, SOLAPUR
(AUTONOMOUS COLLEGE)**

(Three-Year UG Programme Structure as per NEP with effect from June 2023)

BCA – Computer Science & Information Technology

PART-I, SEMESTER – I & II

BCA PART - I, SEMESTER – I

Level	Subject Code	Subject Name	Credit	Marks (ESE+ISE)
4.5	23BCAMM111	Problem Solving Using C Programming	2	50=(30+20)
	23BCAMM112	Basic of Web Programming	2	50=(30+20)
	23BCAMM113	Digital Electronics	2	50=(30+20)
	23BCAGE111 / 23BCAGE112	Mathematics / DTP,CAD & Multimedia	4	100=(60+40)
	23BCAVS111	Hands on Major I & II	2	50=(30+20)
	23BCASE111	Hardware Networking	2	50=(30+20)
	23BCAAE111	English-Business Communication	2	50=(30+20)
	23BCAVE111	Democracy & Good Governance	2	50=(30+20)
	23BCAIK111	Indian Science And Technology	2	50=(30+20)
	23BCACC111	Fundamentals of Wireless Communication	2	50=(30+20)
Total Credits			22	Total = 550

BCA PART - I, SEMESTER – II

Level	Subject Code	Subject Name	Credit	Marks (ESE+ISE)
4.5	23BCAMM121	Advanced C Programming	2	50=(30+20)
	23BCAMM122	Advanced Web Programming	2	50=(30+20)
	23BCAMM123	Laboratory Course on C	2	50=(30+20)
	23BCAMN121	Software Engineering	2	50=(30+20)
	23BCAOE121 / 23BCAOE122	Statistical Method /Vedic Mathematics	4	100=(60+40)
	23BCAVS121	Hands on Adv. Web Programming	2	50=(30+20)
	23BCASE121	Wordpress	2	50=(30+20)
	23BCAAE121	Development of Human Skill	2	50=(30+20)
	23BCAVE121	Office Automation	2	50=(30+20)
	23BCACC121	SWAYAM (Yoga and Positive Psychology for Managing Career and life)	2	50=(30+20)
Total Credits			22	Total = 550

GE-General Electives, VSC-Vocational Skill Courses, SEC-Skill Enhancement Courses, AEC-Ability Enhancement Courses, VEC- Value Education Courses, IKS- Indian Knowledge System, CC- Co curricular Courses

NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	I	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	Major- Mandatory -1					
Paper Name:	Problem Solving Using C Programming	ESE*	ISE*	Total	3	2
Paper Code:	23BCAMM111	30	20	50		

Course Objective:

- The course aims to provide exposure to problem-solving through programming.
- It aims to train the student to the basic concepts of the C-programming language.
- This course involves a lab component which is designed to give the student hands-on experience with the concepts.

Course Learning Outcomes:

After the completion of this course, the student should be able to:

- Given a computational problem, identify and abstract the programming task involved.
- Approach the programming tasks using techniques learned and write pseudo- code.
- Choose the right data representation formats based on the requirements of the problem.
- Write the program on a computer, edit, compile, debug, correct, recompile and run it.
- Identify tasks in which the numerical techniques learned are applicable and apply them to write programs, and hence use computers effectively to solve the task.

Unit 1: Programming Methodology & Introduction to ‘C’**15 Hours**

- Definition of Problem:- Problem solving steps, Introduction to programming planning tools, Need of programming planning tools, Definition of Logic
- Types of logic- 1) Sequence logic 2) Selection logic 3) Iteration logic
- Algorithm:- Definition, Characteristics or features of algorithm, Examples of algorithm to solve problem.
- Flowchart:- Definition, characteristics or features of flowchart, Symbols used in flowchart, Examples that converts algorithms to flowchart
- Pseudo Code:- Definition, characteristics or features of pseudo code.
- Examples of pseudo code that implements sequence logic, Selection logic and iteration logic
- Introduction to ‘C’
- History or evolution of ‘C’ language Features or characteristics of ‘C’ language,
- Structure of ‘C’ program, Compilation & execution of program.
- ‘C’ Fundamentals:- ‘C’ tokens [Keywords, Identifier, Special symbols (‘C’ character sets), Variables, Constants
- Data types- Primitive, Derived, User defined, Operators- Arithmetic, logical, assignment, relational, bitwise, conditional, increment, decrement, sizeof, comma, operator etc.
- Type casting or type conversion
- Use of ‘typedef’ and ‘enum’
- Precedence and associativity of operator.
- Header files and its use.
- Data input and output operations:- Introduction to input and output operations, Introduction to stdio.h header file, stdio.h header file functions- printf(), scanf(), getchar(), putchar()
- Different format codes or format specifier with their use
- Different back slash (escape sequence) character constants with their use

Unit 2: Control Statements & Preprocessor directives**15 Hours**

- Introduction to control statement Types of control statements-
- Selective or Decision making:- if statement, switch statement, Conditional (ternary) operator
- Iterative or looping statement:- While loop, do-while loop, for loop
- Unconditional branching (jump) Statement:- break statement, continue statement, goto statement

- Arrays:
- Introduction & definition of array
- Types of array- 1) One dimensional array 2) Two dimensional array 3) Multi-dimensional array
- Declaration & initialization of array
- Memory allocation view for all types of array.
- Character array (string):- Declaration, operation on string and inbuilt String functions.
- Concept, introduction to preprocessor directives
- Format of preprocessor directives
- File inclusion directives (#include)
- Macros:- Macro substitution directives (#define) , nested macros, parameterized macros
- use of #error and #pragma directives
- use of conditional compilation(#if/#ifdef/#else/#elif/#endif)
- Predefined macros (_DATE_ / _TIME_ / _FILE_ / _LINE_ / _STDC_)
- Preprocessor operators.
- Macro continuation (\)

Recommended Books:

- Programming in ANSII-C – E. Balgurusamy
- The C programming Language - Ritchie and Kernighan.
- Let Us C -Y.C. Kanetkar.
- A structure Programming Approach using 'C'- Behrouz A. Forouzan, RichardF. Gilberg

*Glossary:

1. **ESE:** End Semester Examination/ Evaluation (Final Paper)
2. **ISE:** In Semester Examination/ Evaluation (Internal Assessment)
3. **L/W :** Lectures per Week

S.A.P.D.J Pathshala's						
Hirachand Nemchand College of Commerce, Solapur						
(Autonomous) S.A.P.D.J Pathshala's						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	I	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	Major- Mandatory -2	ESE*	ISE*	Total	3	2
Paper Name:	Basic of Web Programming	30	20	50		
Paper Code:	23BCAMM112					

Course Objective:

- Skill development in web programming including mark-up and scripting languages. Introduction to structure and object oriented programming design.
- Course includes use of XHTML and JavaScript programming languages.
- Understand the principles of creating an effective web page, including an in- depth consideration of information architecture.
- Become familiar with graphic design principles that relate to web design and learn how to implement theories into practice.
- Develop skills in analyzing the usability of a web site.
- Understand how to plan and conduct user research related to web usability.
- Learn the language of the web: HTML and CSS.

Course Learning Outcomes:

After the completion of this course, the student should be able to:

- Structure and implement HTML/CSS.
- Apply intermediate and advanced web development practices.
- Implement basic JavaScript.

Unit 1: Overview of HTML & HTML5&CSS**15 Hours**

- Introduction to Web technology
- Requirement for Internet
- Creating and opening HTML file
- Singular and paired tags, Text form Lists, Image, Image Map, Table,
- Tags-Section, Article, aside, header, foot figure etc.
- Input tag - (Type, Auto focus, placeholder, required etc. attributes.) : Form, get and post method
- Introduction to CSS
- Use of CSS
- Types of CSS, Selectors, Properties, Values.
- CSS Properties- Background, Text, Fonts, Link, List, Table, Box Model, Border, Margin,
- Padding, Display, Positioning,
- Floating, Opacity, Media type, Backgrounds and Borders Image, Values and Replaced Content,
- Text Effects, 2D/3D Transformations, Animations, Multiple Column Layout
- User Interface
- Overview of basic HTML5
- Structure of HTML5 DOCTYPE Element
- Graphics and Media tags in HTML5

Unit 2: JavaScript**15 Hours**

- Introduction to JavaScript
- JavaScript Variables, Data types, Operators, Built in functions in JavaScript
- Control structure in JavaScript : If-else

- Loops : For, While, do While
- Accepting input through form controls and processing : text, select, radio, check boxes, file control, clickable buttons

Recommended Books:

- HTML5 Black Book- Kogent Learning Solutions IncDreamtech.
- Beginning JavaScript and CSS Development with jQuery- Richard York.
- Beginning HTML and CSS-Rob Larsen.
- HTML_ &_ CSS_The_ Complete_Reference-Thomas A. Powell. (Fifth Edition).
- W3schools.com
- HTML5 Black Book- Kogent Learning Solutions IncDreamtech.
- Beginning JavaScript and CSS Development with jQuery- Richard York.
- Beginning HTML and CSS-Rob Larsen.
- HTML_ &_ CSS_The_ Complete_Reference-Thomas A. Powell. (Fifth Edition).
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6. **L/W** : Lectures per Week

S.A.P.D.J Pathshala's						
Hirachand Nemchand College of Commerce, Solapur (Autonomous)						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	I	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	Major- Mandatory -3	ESE*	ISE*	Total		
Paper Name:	Digital Electronics				3	2
Paper Code:	23BCAMM113	30	20	50		

Course Objective:

- Learn and understand the basics of digital electronics, Boolean algebra.
- Able to design the simple logic circuits and test/verify the functionality of the logic Circuits.

Course Learning Outcomes:

After the completion of this course, the student should be able to:

- Distinguish between analog and digital systems.
- Identify the various digital ICs and understand their operation.
- Apply Boolean laws and K-map to simplify the digital circuits.

Unit 1: Digital circuit design**15 Hours**

- Introduction to digital electronics
- Importance and use of digital electronics
- Circuit design using logic gates- (OR,AND,NOT,NOR,NAND,XOR,XNOR)
- Converter: Binary to gray converter, Gray to Binary converter, Decimal to BCD encoder
- Circuit design using state table/K-map
- Design of Half adder, Full adder, Design of full subtractor
- Design of BCD to seven segment decoder
- Concept of excitation table: Design of 3 bit synchronous up counter 3 bit random sequence Generator
- Multiplexer Different types & De-multiplexer Different types
- Encoder, Decoder and segment decoder
- Basic cell of static and dynamic RAM
- Associative memory
- Cache memory organization and Virtual memory organization

Unit 2: Number Systems and Arithmetic**15 Hours**

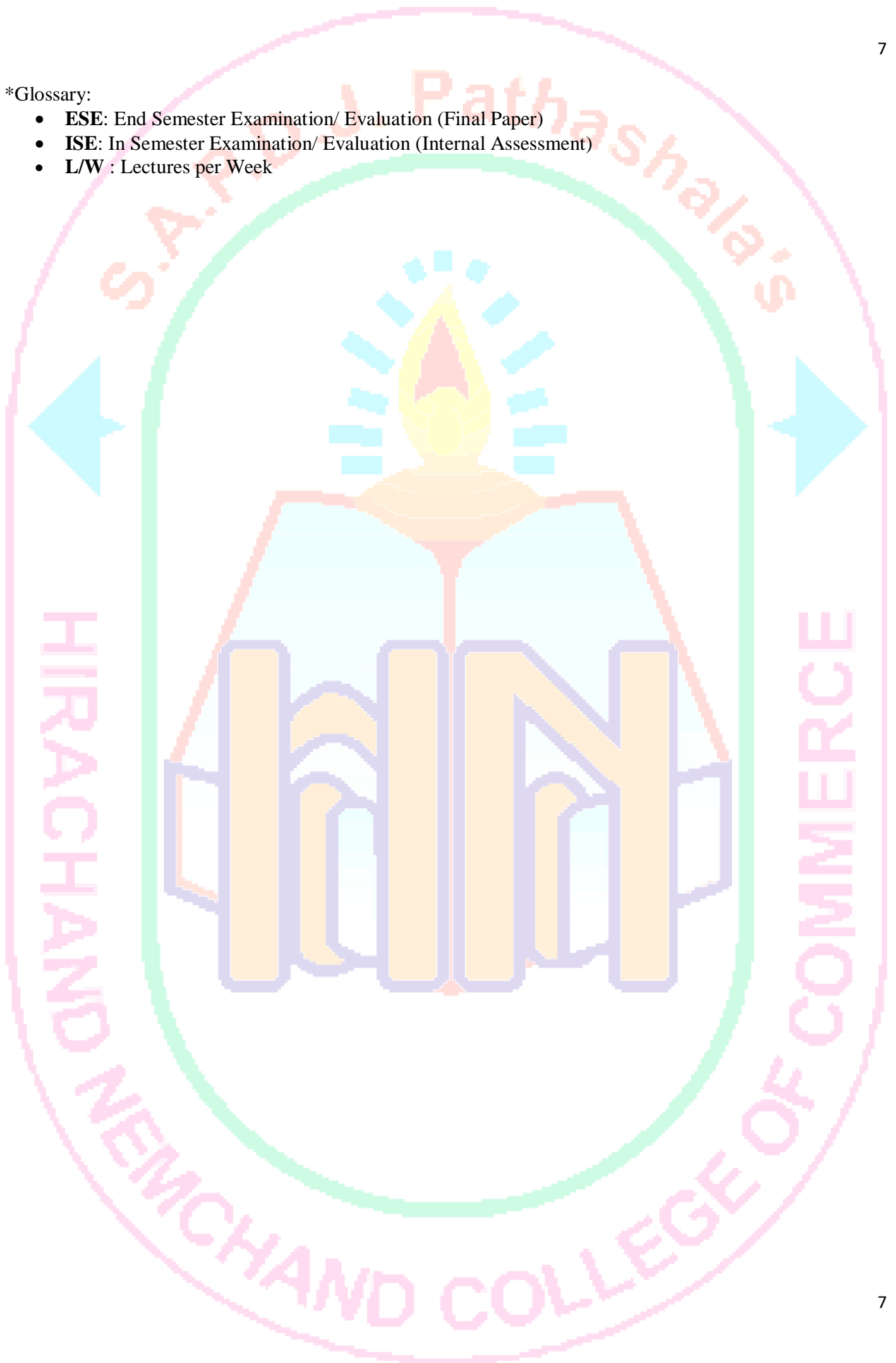
- Decimal Number System, Binary Number System
- Octal number System, Hexadecimal number system.
- Decimal to Binary conversion, Binary to Decimal conversion
- Hexadecimal to binary conversion, Binary to Hexadecimal conversion
- Hexadecimal to decimal conversion, Binary Arithmetic :
- Binary addition, subtraction, multiplication & division, Binary subtraction using 2's complement Method

Recommended Books:

- Digital principle & applications- Malvino Leech
- Fundamental of Digital electronics : R.P. Jain ,
- Digital design : M. Morris Mano, Prentice-Hall of India
- Digital Electronics- C.F. Strangio Modern Digital electronics- R.P. Jain

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- **L/W :** Lectures per Week



S.A.P.D.J Pathshala's Hirachand Nemchand College of Commerce, Solapur (Autonomous)						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	I	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	GE 1					
Paper Name:	Mathematics	ESE*	ISE*	Total	3	4
Paper Code:	23BCAGE111	60	40	100		

Course Objective:

- To enable professional undergraduate students to understand the importance of mathematics in computer science.

Course Learning Outcomes:

After the completion of this course, the student should be able to:

- At the end of the syllabus, students will come to understand the importance of mathematics in computer science.
- Students will effectively communicate topics in the mathematical sciences.
- Students will formulate, analyze, and solve a wide variety of problems in the mathematical sciences.
- Students will engage in a lifelong learning process via the ability to self-educate.
- Students will demonstrate proficiency with the topical content and techniques included in the courses in the mathematical sciences.

Unit 1: Basics of Matrices**15 Hours**

- Definition, order, types of matrices: square matrix, rectangular matrix, diagonal matrix, scalar matrix, upper triangular matrix, lower triangular matrix, symmetric matrix, skew symmetric matrix, identity matrix, row matrix, column matrix, transpose of a matrix, inverse of a matrix
- Algebra of matrices: addition, subtraction, scalar multiplication, matrix multiplication.

Unit 2: Sets and Relations**15 Hours**

- Definition :Set, Subset, power set, disjoint sets
- Operations on sets :Union, Intersection , Complement , Difference , Symmetric difference
Algebraic properties of set operations: Commutative laws, Distributive laws, Associative laws, DeMorgan's laws, Cardinality of set.
- Relation :Definition of Cartesian product , relation
- Types of relation: void, universal, identity, reflexive, symmetric, transitive, equivalence, anti-symmetric, partial ordering, asymmetric, Matrix representation of relation, Graphical representation (digraph) of relation, In- degree and out-degree of a vertex
- Transitive closure: Warshall's algorithm

Unit 3: Elementary logic**15 Hours**

- Propositional Calculus:
Proposition- Simple statement, Compound statement, Logical connectives, Disjunction, Conjunction, Negation , Implication, Double implication, Converse, inverse and contra positive of conditional statement, truth tables, tautology, Contradiction & neither, commutative laws, associative laws, distributive laws, Demorgan's laws, logical equivalence.

Unit 4: Graph, Euler and Hamiltonian Graph, Derived graphs and Tree**15 Hours**

- Definition and elementary results,
- Types of graph: Simple graph, Multi-graph, pseudo graph, complete graph, Null graph, Regular graph, Bipartite graph, weighted graph, degree of a vertex, total degree of a graph, shaking hand lemma and

elementary results, Adjacency and incidence matrix .

- Walk, trail , path, circuit, length of a path, Euler trail and Euler's circuit, Euler's graph, Hamiltonian Path and Hamiltonian Circuit, Hamiltonian Graph, travelling sales man problem, Chinese Postman problem
- Sub graphs, Vertex deleted & edge deleted sub graphs, Vertex disjoint & edge disjoint sub graphs, Operations on graphs- Union, Intersection, Ring sum of two graphs, complement of a graph.
- Tree: Definition and elementary results, Spanning Trees, Shortest spanning tree , Kruskal's algorithm for shortest spanning tree.

Recommended Books:

- Elements of Discrete Mathematics- C.L.Liu
- Discrete Mathematical structure for Computer Science-Alan Doerr and K.Leveessuer
- Elements of graph theory- Bhave&Raghunathan
- Discrete mathematics & its applications- K. Rosen

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S.A.P.D.J Pathshala's Hirachand Nemchand College of Commerce, Solapur (Autonomous)						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	I	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	GE 1					
Paper Name:	DTP & Multimedia	ESE*	ISE*	Total	3	4
Paper Code:	23BCAGE112	60	40	100		

Subject – Desktop Publishing and Multimedia Desktop Publishing and Multimedia

UNIT – I

Importance and Advantages of DTP, DTP Software and Hardware, Commercial DTP Packages, Page Layout Programs, Introduction to Word Processing, Commercial DTP Package, Difference between DTP Software and Word Processing Software.

UNIT – II

Types of Graphics, Uses of Computer Graphics Introduction to Graphics Programs, Font and Typefaces, Types of Fonts, Creation of Fonts (Photographer), Anatomy of Typefaces, Printers, Types of Printers used in DTP, Plotter, Scanner.

UNIT – III

History and Versions of Page Maker, Creating a new Page, document setup dialog box, paper size, page orientation, margins, different methods of placing text and graphics in a document. Master Page, story editor, formatting of text, indent, leading, hyphenation, spelling check, creating index, text wrap, position (Superscript/subscript), control palette.

UNIT – IV

History, multimedia elements; text, images, sound, animation and video. Text, Concept of plain text and formatted text, RTF & HTML text, image, importance of graphics in multimedia, image capturing methods, scanner, digital camera, Sound - sound and its effect in Multimedia, analog and digital sound, animation, basics, principles and use of animation, video, basics of video, analog and digital video.

UNIT – V

Features of multimedia, overview of multimedia, multimedia software tools, multimedia authoring – Production and presentation, graphic file formats, MIDI – Overview, concepts, structure of MIDI, MIDI Devices, MIDI Messages.

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S.A.P.D.J Pathshala's						
Hirachand Nemchand College of Commerce, Solapur (Autonomous)						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	I	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	SEC-1	ESE*	ISE*	Total	3	2
Paper Name:	Hardware Networking					
Paper Code:	23BCASE111	30	20	50		

Course Objective:

- To Train the students to acquire knowledge in PC Hardware, Software and the field of Networking.
- The Students will understand and gain knowledge in the basics of PC assembling and networks.

Course Learning Outcomes :

After the completion of this course, the student should be able to:

- The student will be able to know the Basic of Computer assembling and trouble shooting.
- This course will provide the brief knowledge of Computer networking and trouble shooting.

Unit 1: Introduction to Computer Fundamentals**15 Hours**

- Introduction Computer Fundamentals
- Introduction to Computers
- Introduction to Input Output Devices
- Introduction to Storage Devices
- Principles of Data Communication

Hardware PC Assembling & Troubleshooting

- Hardware Configuration
- Introduction to basic components of a typical PC
- Assembling a PC
- Formatting, Installing Operating System and other system software
- Basic Trouble shooting during the assembling
- Basic troubleshooting of PC

Networking Fundamentals

- Introduction to various types of cables and connectors used in networking
- Introduction to networking and networking concepts, networking topology and protocols
- The 7 Layer architecture
- Three way handshake
- Repeaters, Hubs, Switches, Bridges, Routers
- LAN, MAN, WAN
- Hubs vs. Switches

Unit 2: Network Installation and Configuration**15 Hours**

- Installing the NIC Card, MAC Address
- LAN Standards – Ethernet, Token Ring
- Structured Cabling of LAN Practical's
- IP Addressing and IP Classes
- TCP/IP Concepts and configuration of IP Address
- Joining computer to a AD Domain
- Basic network troubleshooting

Firewall and Proxy Servers

- Kinds of firewalls
- Packet filters
- Application level filtering
- Circuit level gateways
- Dynamic packet filters
- Distributed firewalls
- Filtering Services
- Packet filtering
- Implementing policies

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S.A.P.D.J Pathshala's Hirachand Nemchand College of Commerce, Solapur (Autonomous)						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	I	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	AEC-1	ESE*	ISE*	Total	2	2
Paper Name:	English-Business Communication	30	20	50		
Paper Code:	23BCAAE111					

Course Objective:

- To develop the abilities necessary for the business communication
- To improve soft skills and competence
- In the direction of enhance professional skills required for the business communication

Course Learning Outcomes:

After the completion of this course, the student should be able to:

- Improve soft skills and competence required for the business communication
- Develop professional skills used in the oral and written communication
- Develop their vocabulary and business communication skills

Unit 1: Introduction to Communication**15 Hours**

- Definition, Process, Scope and Objectives of Communication
- Barriers to communication, Overcoming the barriers
- Downward communication, Upward Communication, Horizontal communication
- **Verbal Communication:**
- Principles oral communication; Media of Oral Communication, 7 C's of effective communication
- **Non-Verbal Communication:**
- Uses of Non-verbal Communication; Methods- Non-verbal aspects of written communication, Body Language, Para language

Unit 2: Skills for Business Communication**15 Hours**

- **Effective Speech-**
- Finding out about the environment; Preparing for the text; Speaker's Appearance and Personality, Practicing Delivery of Speech; Commemorative Speeches (Welcome & Introduction, Vote of thanks, Self Introduction)
- **Soft Skills-**
- Attributes of Soft Skills, Hard Skills V/s Soft Skills, Intrapersonal skills as Soft Skills
- **Listening Skills-**
- Concept, Process of Listening, Types of Listening

Recommended Books:

- Soft Skill: Know Yourself and Know the World-Dr K. Alex-S Chand & Company.
- Managerial Communication – Urmila Rai and S. M.Rai, Himalaya Publishing House (ISBN-10: 9350247992, ISBN-13: 978-93-5024-799-0)
- Communication – C. S. Rayudu, Himalaya Publishing House (ISBN Number : 978-93-5051-953-0)
- Literary Voyage – A compulsory English Textbook for BA/ B.Com/ B.Sc I Year (Macmillian Education)

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- **L/W :** Lectures per Week

S.A.P.D.J Pathshala's Hirachand Nemchand College of Commerce, Solapur (Autonomous)						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	I	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	IKS - 1	ESE*	ISE*	Total	2	2
Paper Name:	Indian Science & Technology	30	20	50		
Paper Code:	23BCAIK111					

Course Objective:

- The objective of this course is to provide an exposure to the development of Science and Technology in India, and is primarily meant for teachers and research scholars in various universities and colleges.
- This course will highlight important concepts in mathematics, astronomy, medicine, etc., that originated and developed in India.

Course Learning Outcomes:

After the completion of this course, the student should be able to:

- This course will impart authentic knowledge of India's scientific and technological traditions and will show through case studies how some of them are still relevant in today's world.
- It would also try to provide an understanding of the socio-cultural and philosophical context in which the various scientific and technological ideas got developed in India and thereby help in repositioning India's contributions in science and technology.

Unit-I : History of Science in India

India's contributions to the world of science- 1. under-represented 2. misrepresented.

Introduction historical context to developments in astronomy, mathematics and chemistry.

Unit-II : History of Technology in India

India's technological achievements which are underrepresented.

Introduction to Agriculture, urbanism, early craft techniques and metallurgy.

Constructions, transport, textiles, paper and writing, along with some miscellaneous technologies.

Water management, forest management, farming techniques

Unit-III : India and the World – I

How India has shaped the world, and how the world has shaped India.

Indian interaction with other cultures and civilization.

Explore exchanges, channels and methods.

Unit-IV : India and the World – II

Indian science to shape the world

Indian exchanges with other parts of world.

References:-

<https://indusuni.ac.in/iks/>

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NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	I	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	CC-1					
Paper Name:	Fundamentals Of Wireless Communication	ESE*	ISE*	Total	3	2
Paper Code:	23BCACC111	30	20	50		

ABOUT THE COURSE

This course will provide a basic introduction to a wireless communication system. Starting with the large scale propagation models, the students will study the modelling of wireless channel as a linear time varying filter, statistical multipath models and wireless Digital Modulation/ Digital Demodulation techniques. The performance of the digital modulation techniques in Rayleigh fading channel and additive white Gaussian noise (AWGN) will also be studied. This course will also introduce students to channel capacity in non-fading and fading channel conditions, multiple access techniques, cellular standards from 2G to 5G along with Wireless Local area networks (WLAN) standards from IEEE 802.11a to IEEE 802.11ax.

PRE-REQUISITES

- 1.Principles of Signals and Systems
- 2.Principles of Communication Systems Desirable:
- 3.Principles of Digital Communications
- 4.Matlab Coding

INDUSTRY SUPPORT

In general, any company/ industry working with Wireless Communication and cellular/ Wi-Fi technology will recognize this course. Some examples include

- 1.Cellular Operators: Jio/Airtel/ BSNL/Aircel/VI
- 2.CDOT
- 3.Cisco/ Ericsson/ Nokia / Arista Networks
- 4.Qualcomm / Samsung

Course layout

- Week 1: Introduction to Wireless Communication
- Week 2: Wireless Channel Models
- Week 3: Large Scale Fading
- Week 4: Small Scale fading
- Week 5: Digital Modulations techniques MPSK and MQAM schemes
- Week 6: Error Performance in AWGN and Fading channel
- Week 7: Basics of Multiple Access techniques (FDMA, TDMA, CDMA, OFDMA)
- Week 8: Basics of Cellular (from 2G to 5G) and WLAN (IEEE 802.11a to IEEE 802.11ax) Standards

Books and references:

- Wireless Communication (Andrea Goldsmith): Cambridge University Press
- Wireless Communications Principles and Practice (Theodore Rappaport): Pearson Education India
- Fundamentals of Wireless Communication (David Tse and Pramod Viswanath): Cambridge University Press

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NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	II	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	Major- Mandatory -4	ESE*	ISE*	Total		
Paper Name:	Advanced C Programming	30	20	50	3	2
Paper Code:	23BCAMM121					

Course Objective:

- Utilize the best of the inbuilt functions for various input and output operations.
- Implement the concept of arrays.
- Implement problem solving skills using pointer concept of the programming languages.
- Work efficiently with files using the programming languages.

Course Learning Outcomes: After the completion of this course, the student should be able to:

- After Completion of this course the student would be able to
- Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
- Write programs that perform operations using derived data types.

Unit 1: Functions & Pointer**15 Hours**

- Introduction & definition of function, Need or use of function.
- Types of Functions:- Inbuilt/Predefined/Library functions, User defined function, Steps to add or include user defined function in program
- Function declaration (Prototyping)
- Function calling
- Function definition (Function Implementation)
- Types of Function depending on its signature & return type-
- Function with argument without return value
- Function with argument with return value
- Function without argument with return value
- Function without argument without return value Definition, characteristics & importance of local & global variable Recursion of function
- Introduction & definition of storage Classes:- auto, extern, static, register
- Definition and declaration, Operation on pointer Pointer initialization, Pointer and function Pointer and array, Pointer of pointer
- Generic pointer
- Call by value and Call by reference
- Dynamic memory allocation :- malloc(), calloc(), realloc(), free()
- Pointer to string
- Traversing string through its pointer

Unit 2: Structure and Union, File Handling**15 Hours**

- Definition and declaration, Array of structures Passing structure to function, Pointer to structure Nested structure, self referential structure
- Passing entire structure to user defined function
- Size of and type def.
- Memory allocation view for all types of array.
- Character array (string):- Declaration, operation on string and inbuilt String functions.

Union:-

- Concept of union

- Declaration, definition of union
- Accessing union members
- Difference between Structures & unions
- Standard input- get char(), getch(), getche() Standard output- put char(), putch(), putche(), Formatted input- scanf(), sscanf(), fclose()
- fopen(), fgetc(), fputc(), getw(), putw(), feof(), fgets(), fputs(), fprintf(), fscanf(), ftell(), rewind(), fclose() etc.
- File opening mode- open, modify, write, append, Text and binary mode.

Recommended Books:

- Programming in ANSII-C – E. Balgurusamy
- The C programming Language - Ritchie and Kernighan.
- Let Us C - Y.C. Kanetkar.

***Glossary:**

- **ESE:** End Semester Examination/ Evaluation (Final Paper)
- **ISE:** In Semester Examination/ Evaluation (Internal Assessment)
- **L/W :** Lectures per Week

S.A.P.D.J Pathshala's Hirachand Nemchand College of Commerce, Solapur (Autonomous)						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	II	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	Major- Mandatory -5					
Paper Name:	Advanced Web Programming	ESE*	ISE*	Total	3	2
Paper Code:	23BCAMM122	30	20	50		

Course Objective:

- Skill development in web programming including mark-up and scripting languages. Introduction to structure and object oriented programming design.
- Course includes use of XHTML and JavaScript programming languages.
- Understand the principles of creating an effective web page, including an in- depth consideration of information architecture.
- Become familiar with graphic design principles that relate to web design and learn how to implement theories into practice.
- Develop skills in analyzing the usability of a web site.
- Understand how to plan and conduct user research related to web usability.
- Learn the language of the web: HTML and CSS.

Course Learning Outcomes:

After the completion of this course, the student should be able to:

- Structure and implement HTML/CSS.
- Apply intermediate and advanced web development practices.
- Implement basic JavaScript.

Unit 1: Introduction Advance Java Script Concepts**15 Hours**

- OOP with JavaScript, DOM, Math, Array, History, Navigator, Location, Windows, String, Date, Document objects, user defined function,
- Validation in JavaScript
- Event & event handling in JavaScript.
- Handling Runtime CSS and other Form Control Properties

Unit 2: JQuery and Handling HTML Elements in JQuery**15 Hours**

- Introduction to JQuery
- Need of JQuery
- Adding jquery to Your Web Pages
- jquery Syntax, jquery Selectors, jquery Event Methods,
- jquery Effects - Hide and Show, Fading, Sliding, Animation
- jquery Callback Functions,
- jquery – Chaining,
- jquery – Get and Set Content and Attributes,
- jquery - Add Elements, Add Several New Elements,
- jquery - Remove Elements,
- jquery - Get and Set CSS Classes,
- jquery - css() Method,
- jquery - The noConflict() Method
- JQuery – AJAX Introduction
- JQuery – AJAX load()
- JQuery – AJAX get() and post()

Recommended Books:

- HTML5 Black Book- Kogent Learning Solutions IncDreamtech.
- Beginning JavaScript and CSS Development with jQuery- Richard York.
- Beginning HTML and CSS-Rob Larsen.
- HTML_&_CSS_The_Complete_Reference-Thomas A. Powell. (Fifth Edition).
- W3schools.com
- HTML5 Black Book- Kogent Learning Solutions IncDreamtech.
- Beginning JavaScript and CSS Development with jQuery- Richard York.
- Beginning HTML and CSS-Rob Larsen.
- HTML_&_CSS_The_Complete_Reference-Thomas A. Powell. (Fifth Edition).
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S.A.P.D.J Pathshala's Hirachand Nemchand College of Commerce, Solapur (Autonomous)						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	II	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	Minor- 1					
Paper Name:	Software Engineering	ESE*	ISE*	Total	3	2
Paper Code:	23BCAMN121	30	20	50		

Course Objective:

- To introduce the fundamental concepts of software engineering process, product and project.
- To develop appropriate knowledge of requirements specification and design solutions for the given problem.
- To introduce the different testing strategies and techniques
- Extract and analyze software requirements specifications for different projects
- Develop some basic level of software architecture/design
- Understand the importance of the stages in the software life cycle.

Course Learning Outcomes:

After the completion of this course, the student should be able to:

- Analyze the various aspects of software requirement engineering.
- Understand the importance of establishing the boundaries of a system and the concept of various models.
- Understand and analyze the decisions about the system architectural design process
- Understand the various process models.
- Learn developing methodology of software project
- Understand tools and techniques of software engineering
- Verify and validate the problem of software programming
- Maintain the quality of software project

Unit 1: Introduction to Software Engineering**15 Hours**

- Definition of software engineering
- Characteristics of software
- Qualities of software
- System Analysis and Role of System Analyst
- What is System Development life cycle? SDLC Models-
- Classical model
- Spiral model
- Waterfall model
- Prototyping Model
- RAD model
- Need of fact finding techniques Fact finding techniques-
- Interviews
- Questionnaire
- Record reviews
- Observation

Unit 2: System Analysis & Design tools, Software Testing**15 Hours**

- Decision Tree
- Entity relation Analysis (ERD)
- Normalization : 1NF, 2NF, 3NF
- Data flow Diagram (Physical, Logical)
- Data Dictionary: Features of Data Dictionary, Process specification Methods

- Software Testing, Implementation and maintenance
- Need of Testing, White Box, Black Box testing
- Changeover, Pilot, Parallel

Recommended Books:

- Analysis and Design of Information Systems by James Senn.
- System analysis and design by Elias Awad
- Software Engineering by Pressman
- System Analysis and Design by Parthsarty / Khalkar
- Practical guide to structure System Design by Miller/Page/jones.
- Analysis and Design of Information Systems by James Senn.
- System analysis and design by Elias Awad

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- **L/W :** Lectures per Week

S.A.P.D.J Pathshala's Hirachand Nemchand College of Commerce, Solapur (Autonomous)						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	II	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	GE- 2					
Paper Name:	Statistical Method	ESE*	ISE*	Total	3	2
Paper Code:	23BCAOE121	60	40	100		

Course Objective:

- To have a proper understanding of Statistical applications in Economics and Management
- Demonstrate the ability to perform complex data management and analysis.

Course Learning Outcomes:

After the completion of this course, the student should be able to:

- Discuss critically the uses and limitations of statistical analysis
- Solve a range of problems using the techniques covered
- Conduct basic statistical analysis of data.

Unit 1: Population and Sample**15 Hours**

Concept of Statistical population with illustration, Concept of Sample with illustration, Methods of sampling - SRSWR, SRSWOR, Stratified, Systematic (description only) Data condensation and Graphical methods: Raw data, Attribute, Variables, Discrete and Continuous Variable, General principles of classification of raw data, Construction of frequency dist, Cumulative frequency dist Graphical representation of frequency dist- Histogram, Ogives, Numerical problems.

Unit 2: Measures of Central Tendency, Correlation**15 Hours**

Concept of Central Tendency, Objects of Central Tendency, Criteria for good Measures of Central Tendency, A.M. – def., formula for computation for ungrouped & grouped data, combined A.M., effect of change of origin & scale, merits & demerits, Median- def., formula for computation for ungrouped & grouped data, graphical methods, merits & demerits, Mode- def., formula for computation for ungrouped & grouped data, graphical methods, merits & demerits, Empirical Relation between mean ,mode & median, Numerical Problems. Measures of dispersion: Concept of dispersion, Absolute & Relative measures of dispersion, Range- def., formula for computation for ungrouped & grouped data, coeff. of range, merits & demerits, Variance & S.D.- def., formula for computation for ungrouped & grouped data, combined variance, C.V., effect of change of origin & scale, merits & demerits, Numerical problems. Measures of dispersion: Concept of dispersion, Absolute & Relative measures of dispersion, Range- def., formula for computation for ungrouped & grouped data, coeff. of range, merits & demerits, Variance & S.D.- def., formula for computation for ungrouped & grouped data, combined variance, C.V., effect of change of origin & scale, merits & demerits, Numerical problems.

Unit 3: Correlation**15 Hours**

Bivariate data, scattered diagram. Concept of correlation, types of correlation, cause & effect Relation. Karl Pearson's coeff. of correlation (r), limit of r ($-1 \leq r \leq 1$) Interpretation of r , basic assumptions on which r is based. Numerical problems. Regression for ungrouped data-Concept of regression, Derivation of lines of regression by least square principle. Properties of regression coeff. Numerical problems.

Unit 4: Permutations & Combinations**15 Hours**

Principles of counting, Permutations of n dissimilar objects taken r at a time (with without repetitions), Permutations of n objects not all of which r different, Combinations of n objects taken r at a time, Combinations with restriction on selection (excluding or including a particular object in the group), Numerical problems.

Probability: Random expt. – Sample space (finite, infinite, countable),

Events-Types of events, Probability – Classical def., axioms of probability, probability of an event, Theorems of probability (with proof)-

i) $0 \leq P(A) \leq 1$,

ii) $P(A) + P(A') = 1$,

iii) $P(\Phi) = 0$

iv) $P(A) \leq P(B)$ when A is subset of B

Addition law of probability (Statement only). Concept & def. of conditional probability, multiplication law of probability(Statement only), Concept & def. of conditional probability, multiplication theorem, Concept & def. of independence of two events, Numerical problems.

Recommended Books:

- Fundamentals of Mathematical Statistics-Kapoor & Gupta.
- Modern elementary Statistics-J.E.Freund
- Statistical Methods-J.Medhi.
- Fundamentals of Statistics-S.C.Gupta.
- Fundamentals of applied Statistics-Gupta&Kapoor.
- Business Statistics-S.Shah
- Programmed Statistics-B.L.Agarwal.

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S.A.P.D.J Pathshala's Hirachand Nemchand College of Commerce, Solapur (Autonomous)						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	II	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	GE 2					
Paper Name:	Vedic Mathematics	ESE*	ISE*	Total	3	4
Paper Code:	23BCAOE122	60	40	100		

Course Objective:

- Love mathematics by creating a positive attitude through Vedic & Ancient Indian Mathematics
- Help students appreciate ancient Indian Mathematics and its contribution to the world.
- Enhance computational proficiency by involving procedures in Linear and Matrix Algebra
- Improve geometrical thinking by understanding the basic tenets of geometry such as construction of line segments, angles, triangles and circles as used in Ancient India

Course Learning Outcomes:

After the completion of this course, the student should be able to:

- Think critically
- Find mathematical solution of algebraic expressions
- Solve system of linear equations and matrices faster and with ease.
- Appreciate the Mathematical advancements of Ancient India.

Unit 1: Contribution of Indian Mathematicians**15 Hours****Varahmihir**

- Brahmagupta, Srinivasa Ramanujan, Neelkanth Somayya, Bharti Krishna Tirtha
- **Easy Solution of linear equations**
- Introduction of simple equation, Solutions of simple equations, Solutions of linear equations in two variables, Practical application of linear equations in two variables

Unit 2: High Speed Matrix Algebra**15 Hours**

- Introduction and history of Matrices and Determinants, Matrices and Determinants of third order, Inverse of Matrices
- **Vedic Geometry**
- Different forms of straight lines, The Triangle, The Cyclic Quadrilateral, Squares, and the Circle, Geometrical constructions (such as Altars), Transformation of simple shapes Kalpa Sutras-Srautha Sutras and Sulbha Sutras

Recommended Books:

- Vedic Mathematics, Swami Bharati Krishna Trithaji, Motilal Banarsidas, New Delhi.
- Essential of Vedic Mathematics, Rajesh Kumar Thakur, Rupa Publications, New Delhi
- Vedic Mathematics For All Ages, Vandana Singhal, Motilal Banarsidas Publishers.
- Elements of Vedic Mathematics, Udayan S. Patankar, Sunil M. Patankar, TTU Press.

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- **L/W :** Lectures per Week

S.A.P.D.J Pathshala's Hirachand Nemchand College of Commerce, Solapur (Autonomous)						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	II	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	SEC- 2					
Paper Name:	Wordpress	ESE*	ISE*	Total	3	2
Paper Code:	23BCASE121	30	20	50		

Course Objective:

- Introduction to how a web server works with WordPress
- The WordPress file system
- Creating basic things like posts, pages, and users, and changing settings etc.

Course Learning Outcomes:

After the completion of this course, the student should be able to:

- Install WordPress
- Plan their website by choosing color schemes, fonts, layouts, and more
- Create website pages
- Use widgets and plugins
- Create tags for SEO and categories to organize their posts

30 Hours**Unit 1.** Website Introduction.**Unit2.** What is Wordpress Technology**Unit3.** Word press Theme Installation**Unit4.** Introduction To SEO**Unit5.** Seo Algorithms and Plugins**Unit6.** Keyword Research and Plugin**Unit7.** Practice session with task**Unit8.** On Page SEO with Plugin**Unit9.** Practice Session (on Page)**Unit10.** What is Link Building?**Unit11.** Link Building & Practice session**Unit12.** Technical SEO**Unit13.** Technical SEO and Off Page SEO**Recommended Books:**

- Fundamentals of Mathematical Statistics- Kapoor & Gupta.
- Modern elementary Statistics–J.E.Freund
- Statistical Methods–J.Medhi.
- Fundamentals of Statistics- S.C.Gupta.
- Fundamentals of applied Statistics- Gupta & Kapoor.
- Business Statistics–S.Shah
- Programmed Statistics- B.L.Agarwal.

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S.A.P.D.J Pathshala's Hirachand Nemchand College of Commerce, Solapur (Autonomous)						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	II	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	AEC-2					
Paper Name:	Development of Human Skills	ESE*	ISE*	Total	2	2
Paper Code:	23BCAAE121	30	20	50		

Course Objective:

- To enhance human skills
- To improve the personality traits and develop attitude
- To improve oral and written communication skills

Course Learning Outcomes:

After the completion of this course, the student should be able to:

- Students will be able to learn and develop human skills and overall personality.
- Students will be able to learn the soft skills necessary in the work place

Unit 1: Professional Communication**15 Hours**

Group Discussion-concept, importance, characteristics. Public Speaking • Letter writing: Types, parts, layout of letters, Writing job application letter and resume • Story Writing, Dialogue Writing and Blogging (Fashion, Travel, Culture and Personal blog)

Personality: Introduction, Definition, Determinants of personality, Personality Structure.

Attitudes & Values: Attitudes- Concept, Formation of attitude, SWOT Analysis.

Unit 2: Personality Development**15 Hours**

Writing Skills: Principles of writing skills • Writing emails: (Inquiry, Invitation, Thank you, Request for permission, Sponsorship, Job Acceptance and Job Refusal)

Meaning, Aspects of Team building, skills needed for teamwork, Process of team building, characteristics of effective team, Role of a team leader, Role of the team members, Inter-group collaboration.

Interview Preparation: Types of Job Interview, Preparing for the Interviews, Attending the Interview, Interview Process, Employers Expectations, General Etiquette, Dressing Sense, Postures & Gestures and some examples of interviews.

Recommended Books:

- Soft Skills: Know Yourself and Know the World.- Dr. K Alex - S. Chand & Company
- Managing Soft Skills for Personality Development – B.N. Ghosh – McGraw Hill
- Education (India) Pvt. Ltd. New Delhi

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S.A.P.D.J Pathshala's Hirachand Nemchand College of Commerce, Solapur (Autonomous)						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	II	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	VEC-2					
Paper Name:	Office Automation	ESE*	ISE*	Total	2	2
Paper Code:	23BCAVE121	30	20	50		

Course Objective:

- Office tools course would enable the students in crafting professional word documents, excel
- Spread sheets, power point presentations using the Microsoft suite of office tools. To familiarize
- The students in preparation of documents and presentations with office automation tools.

Course Learning Outcomes:

After the completion of this course, the student should be able to:

- To perform documentation
- To perform accounting operations
- To perform presentation skills

Unit 1: Introduction to Computer & Windows, MS Word**15 Hours****Introduction to Computer:**

Applications of Computer – Advantages of Computer – Terms related to Computer - Characteristics of Computer: Speed, Storage, Versatility and Diligence – Hardware & Software.

Windows:

Desktop icons and their functions: My computer, My documents, Network neighborhood, Recycle Bin, Quick launch tool bar, System tray, Start menu, Task bar, Dialog Boxes: List Box, Spin Control Box, Slide, Drop-down list, Radio button, Check box, Text box, Task Bar - System Tray - Quick launch tool bar - Start button - Parts of Windows -Title bar-Menu bar - Scroll bar, Status bar, Maximize, Minimize, close and Resize & Moving a Window, Keyboard

Accelerators: Key board short keys or hotkeys.

MS Word:

Working with Documents -Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents, Sending files to others, Using Tool bars, Ruler, Using Icons, using help.

Formatting Documents:

Setting Font styles, Font selection- style, size, colouretc, Type face - Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Setting Paragraph style, Alignments, Indents, Line Space, Margins, Bullets & Numbering.

Setting Page style:

Formatting Page, Page tab, Margins, Layout settings, Paper tray, Border & Shading, Columns, Header & footer, Setting Footnotes & end notes – Shortcut Keys; Inserting manual page break, Column break and line break, Creating sections & frames, Anchoring & Wrapping, Setting Document styles, Table of Contents, Index, Page Numbering, date & Time, Author etc., Creating Master Documents, Web page.

Creating Tables:

Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Sorting, and Formula.

Drawing: Inserting Clip Arts, Pictures/Files etc.

Tools:

Word Completion, Spell Checks, Mail merge, Templates, Creating contents for books, Creating Letter/Faxes, Creating Web pages, Using Wizards, Tracking Changes, Security, Digital Signature. Printing Documents – Shortcut keys.

Unit 2: MS Excel & MS Power Point**15 Hours**

Spread Sheet & its Applications, Opening Spreadsheet, Menus - main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types. Working with Spreadsheets- opening, Saving files, setting Margins, Converting files to different formats (importing, exporting, sending files to others), Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys.

Entering & Deleting Data:

Entering data, Cut, Copy, Paste, Undo, Redo, Filling Continuous rows, columns, Highlighting values, Find, Search & replace, Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc, Inserting Functions, Manual breaks.

Setting Formula:

Finding total in a column or row, Mathematical operations (Addition, Subtraction, Multiplication, Division, Exponentiation), using other Formulae.

Formatting Spreadsheets:

Labeling columns & rows, Formatting- Cell, row, column & Sheet, Category - Alignment, Font, Border & Shading, Hiding/ Locking Cells, Anchoring objects, Formatting layout for Graphics, Clipart etc., Worksheet Row & Column Headers, Sheet Name, Row height & Column width, Visibility - Row, Column, Sheet, Security, Sheet Formatting & style, Sheet background, Colour etc, Borders & Shading – Shortcut keys.

Working with sheets: Sorting, Filtering, Validation, Consolidation, and Subtotal.

Creating Charts:

Drawing. Printing. Using Tools – Error checking, Formula Auditing, Creating & Using Templates, Pivot Tables, Tracking Changes, Security, Customization.

MS Power point:

Presentation – Opening new presentation, Different presentation templates, setting backgrounds, selecting presentation layouts.

Creating a presentation: Setting Presentation style, Adding text to the Presentation.

Formatting a Presentation:

Adding style, Colour, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout. Adding Graphics to the Presentation- Inserting pictures, movies, tables etc into presentation, Drawing Pictures using draw.

Adding Effects to the Presentation:

Setting Animation & transition effect. Printing Handouts, Generating Standalone Presentation viewer.

MS Access:

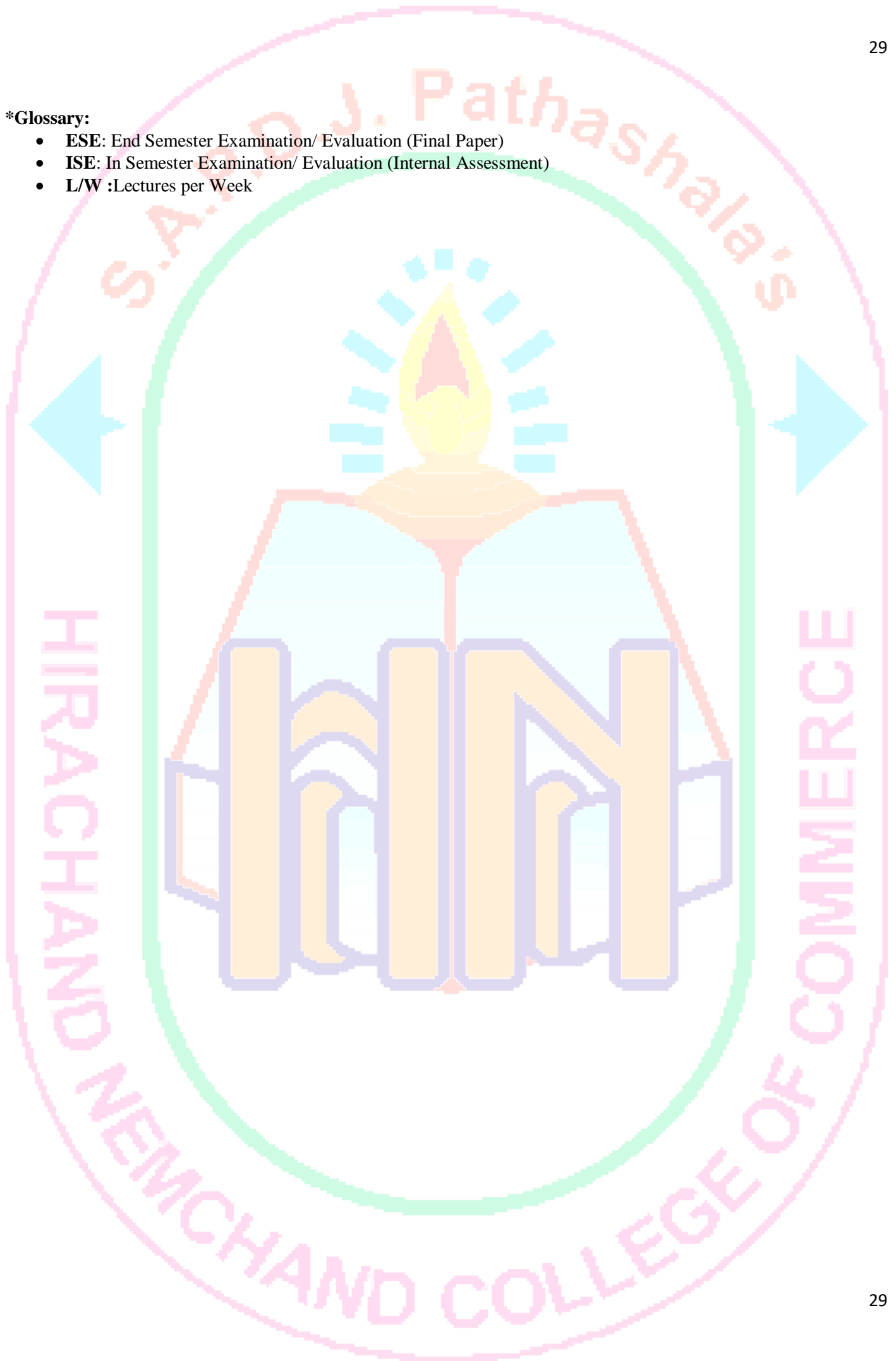
Introduction, Planning a Database, Starting Access, Access Screen, Creating a New Database, Creating Tables, Working with Forms, Creating queries, Finding Information in Databases, Creating Reports, Types of Reports, Printing & Print Preview – Importing data from other databases viz. MS Excel etc.

Recommended Books:

- Information Technology in Business: Principles, Practices, and Opportunities by James A Senn, Prentice Hall.
- Technology and Procedures for Administrative Professionals by Patsy Fulton-Calkins, Thomson Learning.

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S.A.P.D.J Pathshala's Hirachand Nemchand College of Commerce, Solapur (Autonomous)						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	I	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	VSC-1					
Paper Name:	Hands on Major I & II	ESE*	ISE*	Total	2	2
Paper Code:	23BCAVS111	30	20	50		

Practical based on C Programming:

1. WAP to find out factorial of any number.
2. WAP to print the sum and product of digits of an integer.
3. WAP to reverse a number.
4. Write a function that checks whether a given number is perfect or not.
5. Write a function to find whether a given no. is prime or not.
6. WAP to compute the factors of a given number.
7. WAP to find out palindrome numbers between 1 to 100.
8. Write a macro that swaps two numbers.
9. WAP to print a triangle of stars as follows (take number of lines from user):


```

      *
      ***
      *****
      *****
      *****
      
```
10. WAP to perform following actions on an array entered by the user:
 - i) Print the even-valued elements
 - ii) Print the odd-valued elements
 - iii) Calculate and print the sum and average of the elements of array
 - iv) Print the maximum and minimum element of array
 - v) Remove the duplicates from the array
 - vi) Print the array in reverse order
11. WAP a program to find out entered number is palindrome or not?
12. Write a program to display weekday name when user entered any day's first character (e.g. S=Sunday)
13. Write a program to calculate multiplication of two matrices.
14. Write a program that swaps two numbers using pointers.
15. Write a program in which a function is passed address of two variables and then alter its contents.

Practical based on Web Programming:

1. Design different web pages using HTML & HTML5.
2. Design different web pages that use CSS & JavaScript.
3. Design different web pages in JavaScript that shows use of array, inbuilt functions, and operators.
4. Design HTML page to display student Information
5. Design HTML page for all lists.
6. Design HTML page for Image map, table, frameset tags.
7. Create a web page using the Internal/Linked/External style sheet using Text formatting properties, CSS Borders, Margin Properties, Color properties, Use DIV and SPAN tag properties.
8. Write a JavaScript code working with functions: the alert Box, the confirm Box, the prompt Box etc.
9. Solve Following program using JAVA Script to check given number is a. even or odd b. Prime or not c. palindrome or not. d. perfect or not
10. Write a JavaScript code block using objects: String Object, Boolean Object, Number Object, Date Object, Math Object, Window Object, Navigator Object, History Object, Screen Object, Location Object etc.
11. Write a JavaScript to accept an email-id and validate it for following conditions
 - i) User name must be of 8 characters
 - ii) only 1 '@' symbol should be accepted
 - iii) there must be at least 3 character between '@' and '.' symbol
12. Write a JavaScript code to demonstrate any 5 functions of Array.

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NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	II	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	Major- Mandatory -6					
Paper Name:	Laboratory Course on C	ESE*	ISE*	Total	3	2
Paper Code:	23BCAMM123	30	20	50		

Laboratory Course on C

Sample Programs on C

1. WAP to print a triangle of stars as follows (take number of lines from user):

```
*
***
*****
*****
*****
```

2. WAP a program to find out entered number is palindrome or not?
3. Write a program to display weekday name when user entered any day's first character (e.g. S=Sunday)
3. Write a program to calculate multiplication of two matrices.
4. Write a program that swaps two numbers using pointers.
5. Write a program in which a function is passed address of two variables and then alter its contents.
6. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
7. Write a program which count total number of vowels present in string.
8. Write a program to find sum of n elements entered by the user.
9. Write a program to allocate memory dynamically using malloc() / calloc().
10. WAP to illustrate difference between structure and union.
11. WAP to pass array of structure to function.
12. WAP to copy content of one file into another file.
13. WAP to display content of binary files.
14. Write a program to accept integer numbers in file, find even and odd numbers between them store even number into even file and odd number into odd file and display the content of files.
15. Write a program to demonstrate macro substitution.

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NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	II	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	VSC-2					
Paper Name:	Hands on Adv. Web Programming	ESE*	ISE*	Total	2	2
Paper Code:	23BCAVS121	30	20	50		

Practical based on:

1. Design HTML page to display Employee Information.
2. Design HTML page for all lists.
3. Design HTML page for display Table.
4. Design HTML page for Image map, frameset tags.
5. Create a web page using the Internal/ Linked/ External style sheet.
6. Create web page using Text formatting properties, CSS Borders, Margin Properties, Color properties.
7. Create web page Using DIV and SPAN tag properties.
8. Write a JavaScript code working with functions: the alert Box, the confirm Box, the prompt Box etc.
9. Create standard calculator using JavaScript.
10. Create XML page to display student information.
11. Design different web pages that use CSS & JavaScript.
12. Design a different web page that uses JQuery.

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S.A.P.D.J Pathshala's Hirachand Nemchand College of Commerce, Solapur (Autonomous)						
NEP Curriculum, w.e.f. July 2023						
PROGRAMME: B.C.A - I, Level - 4.5						
Semester:	II	Assessment and Evaluation Pattern			L/W*	Credits
Paper Category:	CC-1	ESE*	ISE*	Total	3	2
Paper Name:	Yoga and Positive Psychology for Managing Career and life	30	20	50		
Paper Code:	23BCACC121					

ABOUT THE COURSE :

Management is commonly understood as getting maximum returns from the available resources to achieve valued objectives. Management involves managing money, material, machine and men. While first three factors can be managed in objective manner when it comes to managing 'men' it is essentially managing 'minds'. To manage or lead minds of others a manager needs to manage his or her own mind. Managing mind which can also be termed as managing 'self' requires systematic reflection on 'self'. The course is weaved around the methods of strengthening of physical, emotional, intellectual aspects of 'self' based on the principles and practices of Yoga and Positive Psychology.

INTENDED AUDIENCE:

UG and PG students of science, engineering, management, social sciences, Working professionals, Researchers and Teachers in Yoga

INDUSTRY SUPPORT:

There are many business organizations which promote Yoga and Positive psychology for the enhancing wellbeing of their employees. Employees and Managers of L&OD functions of the corporates will value this course.

Course layout**Week 1**

- I. Need for the Course on Managing Self
- II. Why Positive Psychology and Yoga in this Course?
- III. Positive Psychology: First and Second Wave

Week 2

- I. Yoga from the Lens of Positive Psychology
- II. Yogic Perspective of Positive Events and Positive Institutions
- III. Yogic Perspective of Governance and Micro Macro Integration of Life

Week 3

- I. Health and Wellbeing: Perspectives from Positive Psychology, Yoga and Ayurveda
- II. Human Self and Ladder of Joy: Yogic, Sankhya and Vedantic Perspective

Week 4

- I. TattvaBodh and Indriyajaya: Ways of Attaining Wellbeing
- II. DharmahKriya and Sukhayu-Hitayu: Ways of Attaining Wellbeing

Week 5

- I. Kleshas: The Obstacles on the Way of Attaining Wellbeing
- II. Shat Sampatti: The Means to Surpass the Obstacles on the Way of Attaining Wellbeing

Week 6

- I. Realms and Types of Interventions for Managing Self and Career
- II. Food as the First Intervention for Managing Self
- III. Asanas as the Intervention for Managing Self and Career

Week 7

- I. Prana and Types of Pranayam
- II. Pranayams as the Intervention for Managing Self and Career

III. Pratyahara as the Intervention for Managing Self and Career Week 8

I. Yogic Intervention for Managing Emotions

II. Yogic Intervention for Making Mind a Friend

Books and references:

- Wireless Communication (Andrea Goldsmith): Cambridge University Press
- Wireless Communications Principles and Practice (Theodore Rappaport): Pearson Education India
- Fundamentals of Wireless Communication (David Tse and Pramod Viswanath): Cambridge University Press

Text books:

- Lopez, S. J., Pedrotti, J. T., & Snyder, C. R. (2021). Positive psychology: The scientific and practical explorations of human strengths. Sage publications.
- Rao, K. R., & Paranjpe, A. C. (2016). Psychology in the Indian tradition. Springer India.
- Parker, S. (2015). Clearing the Path: The Yoga Way to Clear and Pleasant Mind. Lotus Press.
- Cornelissen, M. (2011). Foundations of Indian Psychology, vol. 2, Practical Applications. Pearson Education India.

Reference Readings:

- Dagar, C., & Pandey, A. (2020). Well-Being at Workplace: A Perspective from Traditions of Yoga and Ayurveda. The Palgrave Handbook of Workplace Well-Being, 1-28.
- Dagar, C., Pandey, A. & Navare (2022). A. How Yoga-Based Practices Build Altruistic Behavior? Examining the Role of Subjective Vitality, Self-transcendence, and Psychological Capital. J Bus Ethics 175, 191–206
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. American psychologist, 56(3), 218.
- Fredrickson, B. L., & Losada, M. F. (2005). Positive affect and the complex dynamics of human flourishing. American psychologist, 60(7), 678.
- Keyes, C. L. (2002). The mental health continuum: From languishing to flourishing in life. Journal of health and social behavior, 207-222.
- Pandey A and Navare A. (2018). Paths of Yoga: Perspectives for Workplace Spirituality, in
- Dhiman S., Roberts, G.E. and Crossman, J. E. (edis.) The Palgrave Handbook of Workplace

HIRACHAND NEMCHAND COLLEGE OF COMMERCE, SOALPUR
(Autonomous College)
BCA Nature of Question Paper for Choice Based Credit System(CBCS)
Semester Pattern
Faculty of Science & Technology (w.e.f. June 2023)

Date:

Time: -2hrs.

TotalMarks-30

Instructions: 1. All Questions are Compulsory
2. Marks are indicated to the right of each question.
3. Use of Calculators is allowed

Q.1: Fill in the blanks and rewrite the following sentences:

(06)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

Q.2: Write short note/Short answer/Short problem any three from the following:

(06)

- A
- B
- C
- D

Q. 3 Solve the following (Long answer/Problem)

(06)

- A
- B

Q. 4 Answer the following (Any two)

(06)

- A
- B
- C

Q. 5 Answer the following any one

(06)

- A
- B
- C

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(Autonomous College)
BCA Nature of Question Paper for Choice Based Credit System(CBCS)
Semester Pattern
Faculty of Science & Technology (w.e.f. June 2023)

Date:

Time: -2hrs.

TotalMarks-60

Instructions: 1. All Questions are Compulsory
2. Marks are indicated to the right of each question.
3. Use of Calculators is allowed

Q.1: A) Select the most appropriate alternative and rewrite the following sentences: (06)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

B) Fill in the Blanks :

(06)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

Q.2: Answer Any Six of the Following:

(12)

- a)
- b)
- c)
- d)
- e)
- f)
- g)
- h)
- i)
- j)

Q.3: A) Write short notes on Any Two of the following:

(06)

a)

b)

c)

B)

(06)

Q.4: A) Answer the following:

(06)

a)

b)

B)

(06)

Q.5: Attempt Any Three of the following:

(12)

1.

2.

3.

4.