Punyashlok Ahilyadevi Holkar Solapur University, Solapur

NAAC Accredited-2015
'B' Grade (CGPA 2.62)

Name of the Faculty: Science& Technology

CHOICE BASED CREDIT SYSTEM

Syllabus: Bachelor of Computer Applications

Name of the Course: B.C.A. I (Sem–I & II)

(Syllabus to be implemented from w.e.f. June 2019)

Punyashlok Ahilyadevi Holkar SolapurUniversity, Solapur
Choice Based Credit System
Syllabus and Structure of the
Bachelor of Computer Applications (BCA)

With effective from June 2019

1) Title:

The degree shall be titled as Bachelor of Computer Applications (BCA)

2) *Objectives of the course:*

This is a three years bachelor degree course in computer applications aimed at developing computer professional versatile in use of computers mostly in business world. The emphasis is to have generality of developing professionals as programmer, system analysts, database administrators, documentation officer etc.

3) *Duration:*

1. The course shall be a full time course.

2. The duration of course shall be three years.

3. The course shall be run on self-supporting basis.

4) *Number of Students:*

A batch shall consist of not more than 60 students.

5) *Eligibility:*

1. A candidate for being eligible for admission to the Degree Course in Computer Science. Candidate shall have passed XII std. Examination of the Maharashtra Board of Higher Secondary Education or its equivalent or any Diploma of not less than two years.

2. A candidate has to appear for a common entrance test to be conducted by respective college for getting admission to this course.

1. Percentage at HSC	100
2.Percentage at Entrance	100
Total	200

The merit list will be prepared on the basis of percentage of HSC and percentage at entrance examination. Students will be admitted on the basis of Merit list.

6) *Medium:*

The medium of instruction and examination will be only in English.

a) Marks internal for theory and of Lab course and mini project will be given by the concerned college on the basis of evaluation by the internal teacher.

b) Original Report and Viva-Voce:

Project Report will be assessed by the internal teacher at the end of sixth Semester.

The panel of examiners will consist of one internal and one external appointed

by university.

Standard of Passing:

A candidate must obtain minimum 40% marks for passing in each university examination paper, internal examination, Lab course, Major Project.

i. Class will be awarded on the basis of marks obtained by the candidate in all the six semester examination.

ii. Candidate who has secure 40% marks in each head of internal credit and semester examination shall be declared to have passed in the paper.

iii. A candidate who fails in any particular theory papers shall be allowed to reappear for that theory paper. However, his/her internal credit marks shall be carrying forwarded.

Award of Class:

Class should be awarded to the students of BCA on the basis of aggregate marks in the six semesters.

The award of class shall be as under:

Aggregate 70% and above	First class with distinction
Aggregate 60% and above	First Class But less than 70%,
Aggregate 50% and above	Second Class But less than 60%
Aggregate 40% and above	Pass Class But less than 50%

Punyashlok Ahilyadevi Holkar Solapur University
Choice Based Credit System (CBCS), (w.e.f.2019)
Structure for B. C. A. (Science) – Part I

Subject/ Core Course	Name and Type of the Paper		No. of papers/ Practical	Hrs/week			Total Marks Per Paper	UA	CA	Credits
	Type	**Name**		L	T	P				
Class :		**B.C. A.- I Semester –I**								
Ability Enhancement Course(AECC)		English(communication skill)	Paper- I	4.0			100	80	20	4.0
Core	DSC1A	Fundamentals of Computer	Paper-I	2.5	--	--	50	40	10	4.0
		Logic Development With 'C' Programming	Paper-II	2.5	--	--	50	40	10	
	DSC2A	Basics of Web Programming – I	Paper-I	2.5	--	--	50	40	10	
		Software Engineering- I	Paper-II	2.5	--	--	50	40	10	
	DSC3A	Basics of Mathematics – I	Paper-I	2.5	--	--	50	40	10	4.0
		Statistical Methods-I	Paper-II	2.5	--	--	50	40	10	
	DSC4A	DigitalElectronics	Paper-I	2.5	--	--	50	40	10	4.0
		Development of Human Skills	Paper-II	2.5	--	--	50	40	10	
Total				**24**	--	--	**500**	**400**	**100**	**20**
Class :		**B. C. A. - I Semester - II**								
Ability Enhancement Course(AECC)		English (communication skill)	Paper- II	4.0			100	80	20	4.0
Core	DSC1B	Advanced Programming in C	Paper-III	2.5	--	--	50	40	10	4.0
		Introduction to Operating System	Paper-IV	2.5	--	--	50	40	10	
	DSC2B	Basics of Web Programming – II	Paper-III	2.5	--	--	50	40	10	4.0
		OfficeAutomation	Paper-IV	2.5	--	--	50	40	10	
	DSC3B	Basics of Mathematics – II	Paper-III	2.5	--	--	50	40	10	4.0
		StatisticalMethods-II	Paper-IV	2.5	--	--	50	40	10	
	DSC4B	Introduction to Microprocessor	Paper-III	2.5	--	--	50	40	10	4.0
		Software Engineering- II	Paper-IV	2.5	--	--	50	40	10	
	Democracy, Elections and Good Governance			3.0			50	40	10	NC
Total (Theory)				**27**	--	--	**550**	**440**	**110**	**20**
Core		DSC 1 A & 1B	Practical I & II	--	--	4	100	80	20	4.0
		DSC 2 A & 2B	Practical I & II	--	--	4	100	80	20	4.0
		DSC 3 A & 3B	Practical I & II	--	--	4	100	80	20	4.0
		DSC 4 A & 4B	Practical I & II	--	--	4	100	80	20	4.0
		Total (Practical)			16		**400**	**320**	**80**	**16**
		Grand Total		**51**		16	**1450**	**1160**	**290**	**56**

Abbreviations:
L: Lectures   T: Tutorials   P: Practical's   UA : University Assessment   CA : College Assessment   DSC / CC: Core Course   AEC : Ability Enhancement Course
DSE : Discipline Specific Elective Paper   SEC : Skill Enhancement Course   GE : Generic Elective   CA: Continuous Assessment   ESE: End Semester Examination

Course Code: DSC1A **Course Title: Computer Fundamentals**
Total Contact Hours: 30 Hrs. **Total Marks: 50 (30 Lectures)**
Teaching Scheme: Theory 2.5 Lect. /Week **Total Credits: 02**

Unit No.	Description	Number of Lectures
Unit-I	**Computer Fundamentals:** • Introduction to Computer • Characteristics of computer • Concepts of hardware and software • Firmware • Evolution of computer and Generations • Classification and types of computers • Limitation of computer • Applications of computers in various fields. • Structure of computer: • Block diagram of computer: • Basic Units of computer- ➢ Input unit ➢ CPU- ALU ➢ Memory unit and control unit ➢ output unit • Introduction to- ➢ Motherboard ➢ SMPS ➢ Math co-processor ➢ Expansion slots ➢ Serial and parallel ports.	12
Unit-II	**Computer Peripherals :** • Computer Memory: • Memory Concepts • Semiconductor memory • Magnetic memory- RAM, ROM, EPROM, EEPROM • Secondary Storage Devices- ➢ Magnetic Tape ➢ Magnetic Disk (Floppy disk and Hard Disk) ➢ Compact Disk. • Input/ Output Devices: • Input Devices- ➢ Keyboard ➢ Mouse ➢ Light pen ➢ Joystick ➢ Scanner ➢ Graphic Pad ➢ MICR ➢ OMR ➢ Bar Code reader	12

	➢ Digitizer
	➢ Touch Screen.
	
	• VDU
	    ➢ Printers-
	    ➢ Dot Matrix
	    ➢ Daisywheel
	    ➢ Ink Jet
	    ➢ Laser, Line (Chain andDrum)
	    ➢ Plotters.	

Unit-III	**Computer Communication and Networks:** • Concepts of computer communication • Communication components • Computer network • Network Topologies • Communication Channels • Protocols • LAN, WAN,MAN • Introduction to internet • Overview of modem, Bluetooth and router devi• Buying &saling goods over the internet. • E-Mail	06

Books Recommended:
1) Computer Fundamental –P.K. Sinha
2) Computer Fundamental – V. Rajaraman
3) Computer Today – Donaid N. Sanders.

Unit No.	Description	Number of Lectures

Unit-I	**Programming Methodology:**
	• 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) Iterationlogic
	• 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.
		12

Unit-II	**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 associatively of operator.
	• Header files and its use.
		12

		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-III		**Control Statements:**	06
		• Introduction to control stateme	
		• Types of control statements-	
		1) Selective or Decision making	
		➢ if statement	
		➢ switch statement	
		➢ Conditional (ternary) operator	
		2) Iterative or looping statement	
		➢ While loop	
		➢ do-while loop	
		➢ for loop	
		3) 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.	

Books Recommended:
1) Programming in ANSII-C – E. Balgurusamy
2) The C programming Language - Ritchie and Kernighan.
3) Let Us C - Y.C. Kanetkar.
4) A structure Programming Approach using 'C'- Behrouz A. Forouzan, RichardF. Gilberg

First Year BCA (Under Science) Semester- I

Course Code: DSC2A   Course Title:Basics of Web Programming -

ITotal Contact Hours: 30 Hrs.   Total Marks: 50 (30 Lectures)

Teaching Scheme: Theory 2.5 Lect. /Week   Total Credits: 02

Unit No.	Description	Number of Lectures
Unit-I	• **Overview of HTML & HTML5:** • Introduction to Web technology • Introduction to Internet • Requirement for Internet • History of web technology. • Introduction to HTML • Overview of basic HTML • Structure of HTML • Creating and opening HTML file • Singular and paired tags, Text formLists, Image, Image Map, Table, FramForm, get and post method, input tag.	12
Unit-II	HTML5- • Introduction to HTML5 • Need of HTML5 • DOCTYPE Element • Tags-Section, Article, aside, header, foot figure etc. • Events in HTML5, • Input tag in HTML5- (Type, Auto focus, placeholder, required etc. attributes.) • Graphics in HTML5 Media tags in HTML5	8
Unit-III	**CSS & JavaScript:** • 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 • CSS interact with JavaScript.	10

Books Recommended:

1) HTML5 Black Book- Kogent Learning Solutions IncDreamtech.

2) Beginning JavaScript and CSS Development with jQuery- Richard York.

3) Beginning HTML and CSS-Rob Larsen.

4) HTML_&_CSS_The_Complete_Reference-Thomas A. Powell. (Fifth Edition).

5) W3schools.com

First Year BCA (Under Science) Semester- I

Course Code: DSC2A   Course Title:Software Engineering- I
Total Contact Hours: 30 Hrs.   Total Marks: 50 (30 Lectures)
Teaching Scheme: Theory 2.5 Lect. /Week   Total Credits: 02

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Unit No.	Description	Number of Lectures
Unit-I	**System concepts** • Definition of system • Elements of system • System concepts • Types of system • System Analysis and Role of System Analyst	6
Unit-II	**Software Engineering** • Definition of software engineering • Characteristics of software • Qualities of software	6
Unit-III	**System Development life cycle** What is System Development life cycle? SDLC Models- • Classical model • Spiral model • Waterfall model • Prototyping Model • RAD model	12
Unit-IV	**Fact finding techniques** • Need of fact finding techniques Fact finding techniques- • Interviews • Questionnaire • Record reviews • Observation	6

Books Recommended:

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

First Year BCA (Under Science) Semester- I
Course Code: DSC3A   Course Title:Basics of Mathematics - I
Total Contact Hours: 30 Hrs.   Total Marks: 50 (30 Lectures)
Teaching Scheme: Theory 2.5 Lect. /Week   Total Credits: 02

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Unit No.	Description	Number of Lectures
Unit-I	**Basics of Matrices** 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.	10
Unit-II	**Sets and Relations** 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	12
Unit-III	**Elementary logic** Prepositional 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.	8

Books Recommended:
1) Introductory Methods of Numerical Analysis-S.S. Sastry(Prentice Hall)
2. Computer Oriented Numerical Methods. – Rajaraman
3. Elements of Discrete Mathematics- C.L.Liu
4. Discrete Mathematical structure for Computer Science-Alan Doerr and K.Levessuer
5. Discrete mathematics & its applications- K. Rosen

Course Code: DSC3A   **Course Title:Statistical Methods-I**
Total Contact Hours: 30 Hrs.   **Total Marks: 50 (30 Lectures)**
Teaching Scheme: Theory 2.5 Lect. /Week   **Total Credits: 02**

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Unit No.	Description	Number of Lectures
Unit-I	**Population and Sample:** 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.	10
Unit-II	**Measures of Central Tendency**: 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.	10
Unit-III	Correlation 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.	10

Books Recommended:
1. Fundamentals of Mathematical Statistics- Kapoor& Gupta.
2. Modern elementary Statistics – J.E.Freund
3. Statistical Methods – J.Medhi.
4. Fundamentals of Statistics-S.C.Gupta.

Course Code: DSC4A   **Course Title**: Digital Electronics
Total Contact Hours: 30 Hrs.   **Total Marks: 50 (30 Lectures)**
Teaching Scheme: Theory 2.5 Lect. /Week   **Total Credits: 02**

Unit No.	Description	Number of Lectures
Unit-I	**Number Systems and Arithmetic:** • 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	10
Unit-II	**Digital circuit design:** • Introduction to digital circuit design • 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 generato	10
Unit-III	**Combinational Circuit:** • Multiplexer Different types • De-multiplexer Different types Encoder, Decoder and segment decoder	10

Books Recommended:
1) Digital principle & applications- Malvino Leech
2) Fundamental of Digital electronics : R.P. Jain ,
3) Digital design : M. Morris Mano, Prentice-Hall of India
4) Digital Electronics- C.F. Strangio
5) Modern Digital electronics- R.P. Jain

First Year BCA (Under Science) Semester- I

Course Code: DSC4A   **Course Title:Development of Human Skills**
Total Contact Hours: 30 Hrs.   **Total Marks: 50 (30 Lectures)**
Teaching Scheme: Theory 2.5 Lect. /Week   **Total Credits: 02**

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Unit No.	Description	Number of Lectures
Unit-I	**Verbal Communication:** Principles and Practice of Group Discussion Public Speaking (Addressing Small Groups and Making Presentation) **Interview Preparation:** Types of Interview, Preparing for the Interviews, Attending the Interview, Interview Process, Employers Expectations, General Etiquette, Dressing Sense, Postures & Gestures and some examples of interviews. Presentation Skills	8
Unit-II	**Personality :** Introduction, Definition, Theories on personality, The shaping of personality Assessment of Freud's stages Personality traits. **Personality and Organizational Behavior:** Attitudes, Formation of attitude, Types of attitudes, Attitude and OB, SWOT Analysis.	8
Unit-III	**Writing Skills** Principles of writing skills • Writing emails : (Inquiry, Invitation, Thank you, Request for permission, Sponsorship, Job Acceptance and Job Refusal) • 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)	8
Unit-IV	**Study of IT Industry** • 10 most popular IT Industry : Basic and general information, demanded Skills, Work Culture etc • Case study regarding to collect the information of the industry about the selection process of the company.	6

Books Recommended:
1. Communication Skills, Oxford University Press, 2017, Meenakshi Raman, Sangeeta Sharma
2. Organizational Behavior, Himalayan Publication, Mumbai (1991), Aswalthapa, K.
3. Effective Communication, Beacon New Delhi (1996), Balan,K.R. and Rayudu C.S.
4. English for Communication published by Shivaji University, Kolhapur, 1996
5. English for Practical Purposes - Z.N. Patil , B.S.Valke, Ashok Thorat, Zeenath
6. Essentials of Business Communication – Rajendra Pal & L.S.
7. Group Discussion for admissions and Jobs: PustakMahal Delhi, AnandGanguly
8. GD and Interview – PriyankaPrakashan ,ChandreshAgarwal
9. Human Behaviour at work - Davis &Newstrom
10. Organizational Behaviour - Uma Sekaran

First Year BCA (Under Science) Semester- II

Course Code: DSC1BCourse   **Title:Advanced Programming in 'C'**
Total Contact Hours: 30 Hrs.   **Total Marks: 50 (30 Lectures)**
Teaching Scheme: Theory 2.5 Lect. /Week   **Total Credits: 02**

Unit No.	Description	Number of Lectures
Unit-I	**Functions:** • 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 & globalvariable • Recursion. • Introduction & definition of storage Classes • Explanation and use of storage classes- auto, extern, static, register	12
Unit-II	**Pointers:** • Definition and declaration, Operation on pointer • Pointer initialization, Pointer and function • Pointer and array, Pointer of pointer • Call by value and Call by reference • Dynamic memory allocation. **Structures and Union:** • Definition and declaration, Array of structures • Passing structure to function, Pointer to structure • Nested structure, self referential structure • Size of and type def.	10
Unit-III	**File Handling:** • Standard input- get char(), getch(), getche() • Standard output- put char(), putch(), putche(), • Formatted input- scanf(), sscanf(), fsclose(), • File opening mode- open, modify, write, append, Text and binary mode. **Macros and Preprocessing:** • Feactures of C preprocessor • Macro – Declaration, Expansion, File Inclusion.	8

Books Recommended:
1) Programming in ANSII-C – E. Balgurusamy
2) The C programming Language - Ritchie and Kernighan.
3) Let Us C -   Y.C. Kanetkar.

First Year BCA (Under Science) Semester- II

Course Code: DSC1B   **Course Title:Operating System**
Total Contact Hours: 30 Hrs.   **Total Marks: 50 (30 Lectures)**
Teaching Scheme: Theory 2.5 Lect. /Week   **Total Credits: 02**

Unit No.	Description	Number of Lectures
Unit-I	**Introduction:** What is mean by O.S.? - Types of O.S. (Batch, Parallel, Multiprogramming, Time Sharing, Distributed, Real time) - Structure of O.S. - System Components - Services provided by O.S. - Monolithic and Layered Systems - System design and implementation - System Generalization and virtual machine.	12
Unit-II	**Process Management:** - Concepts-Process, System calls - Operations on Process - Cooperating Process and threads - Interprocess Communication - Process Scheduling: - Basic Concept. - Scheduling criteria - Scheduling Algorithms: FCFS, SJF, Round Robin, Priority Scheduling, Multilevel Queue Scheduling.	10
Unit-III	**Process Synchronization:** - Critical section problem - Semaphores - Critical Regions - Classic Problems of Synchronization	8

Books Recommended:
1. System programming and O.S.By D.M. Dhamdhere.
 2. Modern O.S. By Andrews Tanenbaum.
 3. Operating System Concepts BySiberchatz and calvin.

First Year BCA (Under Science) Semester- II

Course Code: DSC2B   **Course Title:Basics of Web Programming - II**
Total Contact Hours: 30 Hrs.   **Total Marks: 50 (30 Lectures)**
Teaching Scheme: Theory 2.5 Lect. /Week   **Total Credits: 02**

Unit No.	Description	Number of Lectures
Unit-I	**JavaScript:** • Introduction to JavaScript • JavaScript Variables, Data types, Operators, Built in functions in JavaScript • Control structure in JavaScript • DOM, Math, Array, History, Navigator, Location, Windows, String, Date, Document objects, user defined function, • Validation in JavaScript • Event & event handling in JavaScript.	15
Unit-II	**JQuery:** • 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	15

Books Recommended:
1) HTML5 Black Book- Kogent Learning Solutions IncDreamtech.
2) Beginning JavaScript and CSS Development with jQuery- Richard York.
3) Beginning HTML and CSS-Rob Larsen.
4) HTML_&_CSS_The_Complete_Reference-Thomas A. Powell. (Fifth Edition).
5) W3schools.com

Course Code: DSC2B   **Course Title:Office Automation**
Total Contact Hours: 30 Hrs.   **Total Marks: 50 (30 Lectures)**
Teaching Scheme: Theory 2.5 Lect. /Week   **Total Credits: 02**

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Unit No.	Description	Number of Lectures
Unit-I	**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 barStatus bar, Maximize, Minimize, close and Resize & Moving a Window, Keyboard Accelerators: Key board short keys or hotkeys.	08
Unit-II	**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.	10
Unit-III	**MS Excel:** 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.	08

	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:	
	Labelling 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, Colouretc, 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.	
Unit-IV	**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.	4

Books Recommended:

1. Information Technology in Business: Principles, Practices, and Opportunities by James A Senn, Prentice Hall.

2. Technology and Procedures for Administrative Professionals by Patsy Fulton-Calkins, Thomson Learning.

3. Computer Fundamental MS Office – Including Internet & Web Technology: Anupama Jain (Author), AvneetMehra

4. The Complete Reference: Virginia Andersen, McGraw Hill

5. MS Office 2007 in a Nutshell: S. Saxena, Vikas Publications

6. MS-Office 2007 Training Guide: S. Jain, BPB Publications

7. Learning Computer Fundamentals, MS Office and Internet & Web Technology: D. Maidasani. Reading, Vols. 1 and

2. Macmillan, 1975, Bhasker, W. W. S &Prabhu, N. S

First Year BCA (Under Science) Semester- II
Course Code: DSC3B   **Course Title:Basics of Mathematics - II**
Total Contact Hours: 30 Hrs.   **Total Marks: 50 (30 Lectures)**
Teaching Scheme: Theory 2.5 Lect. /Week   **Total Credits: 02**

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Unit No.	Description	Number of Lectures
Unit-I	**Graph:** 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 .	10
Unit-II	**Euler and Hamiltonian Graph:** 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	10
Unit-III	**Derived graphs and Tree:** 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.	10

Books Recommended:
1.Elements of Discrete Mathematics- C.L.Liu
2. Discrete Mathematical structure for Computer Science-Alan Doerr and K.Levessuer
3. Elements of graph theory- Bhave&Raghunathan
4. Discrete mathematics & its applications- K. Rosen

Course Code: DSC3B   **Course Title:Statistical Methods-II**
Total Contact Hours: 30 Hrs.   **Total Marks: 50 (30 Lectures)**
Teaching Scheme: Theory 2.5 Lect. /Week   **Total Credits: 02**

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Unit No.	Description	Number of Lectures

Unit-I	**Permutations & Combinations:**
	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
	  v) 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.
		15

Unit-II	**Discrete random variable:** Def. of r.v., discrete r.v., Def. of p.m.f., c.d.f. & properties of c.d.f., Def. of expectation & variance, theorems on expectation, Numerical problems. **Standard Discrete Distribution:** Binomial distribution- Def., mean, variance(only state), illustration of real life situations, additive property (statement only). **Poisson distribution-** mean, variance(only State), illustration of real life situation, additive property (Statement only), Numerical Problems. **Geometric distribution –** Def.,mean, variance(only State), illustration of real life situation, Numerical problems.	8
Unit-III	**Continuous r.v.-** Def.-continuous r.v., p.d.f., c.d.f., statement of properties of c.d.f. Def. of mean & variance, Numerical problems. **Uniform distributions-**Def., mean, variance(only State),Numerical Problems **Normal Distribution-** Definition, identification of parameters, nature of probability curve, s.n.v., properties of normal distribution, distribution of aX+b, aX+bY+c when X & Y are independent, Numerical Problems.	7

Books Recommended:
1. Fundamentals of Mathematical Statistics- Kapoor& Gupta.
2. Modern elementary Statistics – J.E.Freund
3. Statistical Methods – J.Medhi.
4. Fundamentals of Statistics-S.C.Gupta.
5. Fundamentals of applied Statistics-Gupta &Kapoor.
6. Business Statistics – S. Shah
7. Programmed Statistics - B.L.Agarwal.

First Year BCA (Under Science) Semester- II

Course Code: DSC4B **Course Title:Introduction to Microprocessor**
Total Contact Hours: 30 Hrs. **Total Marks: 50 (30 Lectures)**
Teaching Scheme: Theory 2.5 Lect. /Week **Total Credits: 02**

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Unit No.	Description	Number of Lectures
Unit-I	**Fundamental of Microprocessor:** • Introduction to microprocessor • Basic system bus architecture • Intel 8085 microprocessor features • Concept of T state • Machine cycle • Instruction cycle • Types of microprocessor(According to bus and application)	08
Unit-II	**8 bit microprocessor:** • Introduction • Types of 8 bit microprocessor • Pin function of 8085 microprocessor • Internal architecture of 8085 microprocessor • Applications	08
Unit-III	**Instruction set:** • Introduction • Classification of instruction set • Format of instructions • Addressing modes • Assembly language programming of 8085(addition, subtraction, division, multiplication, orders)	08
Unit-IV	**Interfacing:** • Concept of interfacing • Types of interfacing • Concept of I/O mapping • I/O memory mapping techniques • PPI[8285] • Programmable timer[8253]	06

Books Recommended:
1) Microprocessor Architecture, Programming, and Applications with the 8085-Ramesh S. Gaonkar
2) Microprocessor and principles- S.P. Chowdhury, SunetraChowdhury
3) Advanced Microprocessor and principles- K.M. Bhuruhand, A.K. Ray

First Year BCA (Under Science) Semester- II
Course Code: DSC4B   Course Title:Software Engineering-
IITotal Contact Hours: 30 Hrs.   Total Marks: 50 (30 Lectures)
Teaching Scheme: Theory 2.5 Lect. /Week   Total Credits: 02

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Unit No.	Description	Number of Lectures
Unit-I	**System Analysis and System Design Tools:** • Flow chart • Decision tables & Decision Trees • Structure charting Techniques (HIPO) • Entity relation Analysis (ERD) • Normalization • Input output design • Data flow Diagram (Physical, Logical), structured chart • Data Dictionary: Features of Data Dictionary, Process specification Methods	12
Unit-II	**Configuration and Construction of the System**: • Collection of system statistics • Setting Sub-system Boundaries • Fractional Approach, Incremental Approach	10
Unit-III	**Software Testing, Implementation and maintenance:** • Need of Testing, White Box, Black Box testing • Changeover, Pilot, Parallel	8
	Case studies Pay Roll, Library System, Inventory Management System, College Admission System	

Books Recommended:
        1) Analysis and Design of Information Systems by James Senn.
        2) System analysis and design by Elias Awad
        3) Software Engineering by Pressman
        4) System Analysis and Design by Parthsarty / Khalkar
        5) Practical guide to structure System Design by Miller/Page/jones.

Course Code: BCA 106   **Course Title: Lab 1 Based on DSC 1 A & 1B**

Total Marks: 100   Practical: 60 Lectures

Teaching Scheme: Practical 8 Pract. /Week   Total Credits: 04

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

<div align="center">

*

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</div>

9. 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

10. WAP a program to find out entered number is palindrome or not?

11. Write a program to display weekday name when user entered any day's first character (e.g. S=Sunday)

12. Write a program to calculate multiplication of two matrices.

13. Write a program that swaps two numbers using pointers.

14. Write a program in which a function is passed address of two variables and then alter its contents.

15. Write a program which takes the radius of a circle as input from the user, passes it to anotherfunction that computes the area and the circumference of the circle and displays the value ofarea and circumference from the main() function.

16. Writea programwhichcounttotalnumberofvowelspresentinstring.

17. Write a program to find sum of n elements entered by the user.

18. Write a program to allocate memory dynamically using malloc() / calloc().

19. WAP to illustrate difference between structure and union.

20. WAP to pass array of structure to function.

21. WAP to copy content of one file into another file.

22. WAP to display content of binary files.

23. 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.

Course Code: BCA 106   **Course Title: Lab 1 Based on DSC 2 A & 2B**

Total Marks: 100   Practical: 60 Lectures

Teaching Scheme: Practical 8 Pract. /Week   **Total Credits: 04**

Unit Name	Description
HTML & HTML 5	Design different web pages using HTML & HTML5.
CSS & JavaScript	Design different web pages that use CSS & JavaScript.
JavaScript	Design different web pages in JavaScript that shows use of array, inbuilt functions, and operators.
JQuery	Design a different web page that uses JQuery.
Windows	Starting Windows- Browsing Start Menu, Manipulating Windows-Moving, Resizing, Closing, Windows, Minimizing and Maximizing Windows, Working With Multiple Windows Using Windows Application. Using Word- Pad to create a document, entering text and saving the work. Using my computer- Changing the icon arrangement, To View the floppy disk. To manage files, selecting one or more files, copying a file, delete a file, Drag and drop to move a file.
File Management using Windows Explorer	To Copy, move and delete files, using copy and paste, using drag and drop, creating a folder. Creating a file to a folder, copying and moving the files between drives, renaming files and folders, find Program- To search by file name, by name, by date, by type, by specific text.
Control Panel	Changing date and time changing display, choosing background, placing folder on desktop. Adding shortcuts to folder and creating shortcut.
MS-Office 2010	a. MS-Word b. MS-Excel c. MS-PowerPoint d. MS-Access

Course Code: BCA 106   **Course Title: Lab 1 Based on DSC 3 A & 3B**

Total Marks: 100   Practical: 60 Lectures

Teaching Scheme: Practical 8 Pract. /Week   Total Credits: 04

1. Algebra of matrices: addition, subtraction,scalar multiplication, matrix multiplication.
2. Operations on Sets: Union, intersection, difference, symmetric difference andcomplement.
3. Algebraic properties of set operations: Commutative laws, Distributive laws,Associative laws,DeMorgan's laws.
4. Transitive closure of relation by using Warshall's algorithm.
5. Matrix representation of graph: Adjacency and incidence matrix of a graph.
6. Traveling salesman problem and Chinese postman problem.
7. Operations on graphs: Union, intersection, ring sum of two graphs, andcomplement of a graph.
8. Kruskal's algorithm to find shortest spanning tree.
9. Construction of frequency dist. & graphical representation.
10. Measures of central tendency(ungrouped data).
11. Measures of central tendency(grouped data).
12. Measures of dispersion.
13. Computation of correlation coeff.
14. Fitting of lines of regression.
15. Fitting of Binomial distribution.
16. Fitting of Poission distribution.
17. Fitting of Geometric Distribution.
18. Fitting of Normal distribution.
19. Model sampling from uniform.
20. Model sampling from binomial distribution.

Course Code: BCA 106 **Course Title: Lab 1 Based on DSC 4 A & 4 B**

Total Marks: 100   Practical: 60 Lectures

Teaching Scheme: Practical 8 Pract. /Week **Total Credits: 04**

1. Study of logic gates.
2. Study of Demorgans Theorem.
3. Half adder using gates.
4. Full adder using gates.
5. RS flip flop.
6. Intercoversion of gates using NAND gate.
7. Intercoversion of gates using NOR gate.
8. Assembly language programming for arithmetic operations using 8085 microprocessor.
9. Assembly program for ascending order using 8085 microprocessor.
10. Assembly program for descending order using 8085 microprocessor.
11. Assembly program for block transfer of program.