SOLAPUR UNIVERSITY, SOLAPUR.
Choice Based Credit System Syllabus and Structure of the
Bachelor of Computer Applications (BCA)

To be effective from June 2016 (Under Science Faculty)

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:
i)   The course shall be a full time course.
ii) The duration of course shall be three years.
iii) 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:
i) 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.
ii) 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) Details of Internal examination:

1. Attendance	05 marks
2. Assignment	20 marks (3 Home & 2 class assignments)
3. Mid-Test	05 marks
Total	30 marks

b) Marks of Lab course and mini project will be given by the concerned college
   on the basis of evaluation by the internal teacher.
c) Original Report and Viva-Voce:
Project Report will be assessed by the internal teacher at the end of sixth semester out of 70 marks and there will be viva-voce examination of 80 marks. 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%

Titles of Papers and Scheme of Study and Evaluation for B.C.A. Program

Semester- I

Course code	Title of Course	Credits		Lectures/Week			Evaluation		
		Th	Pr.	Th	Tu	Pr.	CA	UE	Total
BCA101	Fundamentals of Computer	4	-	5	-	-	30	70	100
BCA102	Basics of 'C' Programming.	4	-	5	-	-	30	70	100
BCA103	Financial Accounting with Tally	4	-	5	-	-	30	70	100
BCA104	Communication Skills	4	-	5	-	-	30	70	100
BCA105	Discrete Mathematics	4	-	5	-	-	30	70	100
BCA106	Lab 1 Based on 101, 102, 103, 105	-	4	-	-	8	30	70	100
	Total	**20**	**4**	**25**	**-**	**8**	**180**	**420**	**600**

Semester- II

Course code	Title of Course	Credits		Lectures/Week			Evaluation		
		Th	Pr.	Th	Tu	Pr.	CA	UE	Total
BCA201	Advanced Programming in C	4	-	5	-	-	30	70	100
BCA202	Web Technology	4	-	5	-	-	30	70	100
BCA203	Software Engineering	4	-	5	-	-	30	70	100
BCA204	Digital Electronics	4	-	5	-	-	30	70	100
BCA205	Computer Oriented Statistics	4	-	5	-	-	30	70	100
BCA206	Lab 2 Based on 201, 202, 204, 205	-	4	-	-	8	30	70	100
	Total	**20**	**4**	**25**	**-**	**8**	**180**	**420**	**600**

First Year BCA (Under Science) Semester- I

Course Code: BCA 101   **Course Title: Computer Fundamentals**

Total Contact Hours: 48 Hrs.   **Total Marks: 100   (60 Lectures)**

Teaching Scheme: Theory 5 Lect./Week **Total Credits: 04**

Course Objective: The objective of this course is to study basics of Computer

Unit No.	Description	No. of Lectures

Unit- 1	**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- 2	**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
		13

	➢ Bar Code reader ➢ Digitizer ➢ Touch Screen. • Output Devices- ➢ VDU ➢ Printers- ➢ Dot Matrix ➢ Daisywheel ➢ Ink Jet ➢ Laser, Line (Chain andDrum) ➢ Plotters.	
Unit- 3	**Introduction to OS and Languages :** • Introduction to Operating Systems & its functions ➢ Definition of Simple batch processing ➢ Multiprogramming operating systems ➢ Multiprocessing operating systems ➢ Real-time operating systems ➢ Time-sharing operating systems • Concept of Spooling • Computer Languages: ➢ Characteristics of good languages. ➢ Analogy with natural languages ➢ Machine language ➢ Assembly Language ➢ High Level Languages ➢ Compiler ➢ Interpreter	11
Unit- 4	**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	12
Unit- 5	**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 devices. - Buying & saling goods over the internet. - E-Mail	12

| | **Security and Safety of Data:**
• Security- Passwords and write protection, thumb & retina scanning
• Safety- Periodic backup, protection from virus.
• Computer viruses-
• Characteristics, types, Detection and removing the viruses
• Protection of Computer from virus and vaccines. | |

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

Course Code: BCA 102　　　　　　　**Course Title: Basics of C programming**

Total Contact Hours: 48 Hrs.　　　　**Total Marks: 100**　　**(60 Lectures)**

Teaching Scheme: Theory 5 Lect./Week　　**Total Credits: 04**

Course Objective: The objective of this course is to study basic of 'C' programming language.

Unit No.	Description	No. of Lectures
Unit- 1	**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) 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.	12
Unit- 2	**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. **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( ),	13

	putchar( ) • Different format codes or format specifier with their use • Different back slash (escape sequence) character constants with their use.	

Unit- 3	**Control Statements:**
	• Introduction to control statements or control structure
	• Types of control statements-
	   1) Selective or Decision making statement-
	     ➢ if statement
	     ➢ switch statement
	     ➢ Conditional (ternary) operator statement.
	   2) Iterative or looping statement-
	     ➢ While loop
	     ➢ do-while loop
	     ➢ for loop
	   3) Unconditional branching (jump) statement-
	     ➢ break statement
	     ➢ continue statement
	     ➢ goto statement
		11

Unit- 4	**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.
		12

Unit-5	**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 & global variable
	• Recursion.
	• Introduction & definition of storage Classes
	• Explanation and use of storage classes- auto, extern, static, register
		12

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

Course Code: BCA 103 **Course Title: <u>Financial Accounting with Tally</u>**

Total Contact Hours: 48 Hrs. **Total Marks: 100** **(60 Lectures)**

Teaching Scheme: Theory 05 Lect./Week **Total Credits: 04**

<u>Course Objective:</u> The objective of this course is to study basics of financial accounting with tally.

Unit No.	Description	No. of Lectures
Unit- 1	**Financial Accounting:** • Definition of Book Keeping and Accountancy • Need for accounting • Internal and External uses of Accounting • Accounting Concepts and conventions. **Double Entry System of Accounting:** • Journal Entries and Posting to ledger • Subsidiary Books • Bank Reconciliation Statement.	14
Unit- 2	**Accounting Policies:** • Inventory Valuation Policy- LIFO, LIFO • Simple Average and weighted Average Methods • Depreciation Policies- SLM, WDV-change in method of depreciation. **Final Accounts:** • Preparation of Final Accounts including adjustment • Final accounts for sole proprietary concern • Format of Final account under company law	16
Unit- 3	**Inventory:** • Introduction to Inventory • Stock Groups • Stock Categories • Stock Item • Reorder Levels • Locations / Go downs • Units of Measure • Price List • Tariff classification • Dealer Excise opening stock • Pure Inventory Voucher • Entry of Pure Inventory Voucher • Bill of Material • Purchase and Sales Order • Invoice Entry • Foreign Exchange Transactions	14
Unit- 4	**Business Management:** • New Year Books • MIS Reports • Budget Management • Scenario Management **TDS:** • Introduction to Tax Deducted at Source (TDS) • TDS in Tally	16

• TDS Masters, Vouchers / Transactions • Advance to a Party • TDS Reports • TDS Return • TDS E-Return • TDS Outstanding • Exception Report **Document Printing:** • Printing Configuration of Vouchers • Printing Reports • Printing of Inventory Reports	

Books Recommended:
1) Elements of double entry book keeping – Batliboi
2) Advanced Accounts – M.C.Shukla, T.S.Grewal and S.C.Gupta
3) An Introduction to Accountancy – S.N.Maheshwari.
4) Accounting for Management – S.K.Bhattacharyya& John Dea
5) Tally.ERP 9 (Training Guide)-   Asok k. Nandani
6) Tally 9-Vishnu Priya Singh

Course Code: BCA 104 **Course Title: Communication Skills**

Total Contact Hours: 48 Hrs. **Total Marks: 100** **(60 Lectures)**

Teaching Scheme: Theory 5 Lect./Week **Total Credits: 04**

Course Objective: The objective of this course is to study basics of communication skills.

Unit No.	Description	No. of Lectures
Unit- 1	**Nature of Communications:** • Definition of communication • Significance of Good Communication • Objectives of Communication • Communication Process • Type of Communication • Non verbal communication aspects of body language and Principles of Communication	16
Unit- 2	**Communication in organization:** • Nature, scope and limitations of communication • Barriers to communication • Overcoming the barriers • Downward communication • Upward Communication • Horizontal communication • Grapevine communication.	14

Unit- 3	**Written Communication:**
	• The process of formal written communication-
	  ➢ The 'you' attitude
	  ➢ classify
	  ➢ conciseness
	  ➢ preciseness
	  ➢ style
	  ➢ flow Accuracy and readability
	• Mechanism of writing-
	  ➢ Abbreviations
	  ➢ Numerals
	  ➢ Capitalization
	  ➢ Spelling
	  ➢ Punctuation.
	Business Correspondence:
	• Business Correspondence in organization
	• Essentials
	• The layout
	• Planning the letter
	• Letter related to-
	  ➢ Purchase
	  ➢ Sales
	  ➢ Business related inquiries
	  ➢ Claims and adjustment
	  ➢ Job application and resume.
		14

Unit- 4		**Foundation of Effective Writing: (AIDS)**
		• Meetings-
		   ➢ Kinds of meetings
		   ➢ The agenda
		   ➢ Minutes of the meeting
		   ➢ Paper work for regular meetings.
		• Report-
		   ➢ Common features
		   ➢ Routing reports and non-routine reports
		   ➢ Steps in writing report.
		• Modern Office Communication-
		   ➢ Electronic communication
		   ➢ Telephone
		   ➢ EPBAX
		   ➢ Teleconferencing
		   ➢ Answering machine
		   ➢ E-mail
		   ➢ Voicemail
		   ➢ Fax
		   ➢ Internet
		   ➢ Video conferencing.
		• Notes –
		   ➢ The General approach will be to give broad idea of business communication.
		   ➢ Practical work will consist of-
		   Letter writing
		   Report writing
		   Arranging meetings and Seminars.
		   Every student will have to deliver minimum two prepared speeches and one extempore speech.
			16

Books Recommended:
1) Essentials of Business Communication – Rajendra Pal & L.S.
2) Business Communication - U.S.Rai&S.M.Rai.
3) Communication skill – P.C. Pardesi.
4) Business Communication, AshaKaul, PHI
5) Business Communication, M. Balasubramanyam
6) Business correspondence and report writing, Sharma, K. Mohan, TataMc-Graw Hill

Course Code: BCA 105 **Course Title: Discrete Mathematics**

Total Contact Hours: 48 Hrs. **Total Marks: 100 (60 Lectures)**

Teaching Scheme: Theory 5 Lect./Week **Total Credits: 04**

Course Objective: The objective of this course is to study the discrete mathematics

Unit No.	Description	No. of Lectures
Unit- 1	**Elementary logic:** • Prepositional Calculus: • Proposition- Simple statement, Compound statement • Logical connectives ➢ Disjunction ➢ Conjunction ➢ Negation ➢ Conditional connectives ➢ Converse, inverse and contra positive of conditional statement • Tautology, Contradiction & neither • logical equivalence • Argument and validity of argument. • Problems	12
Unit- 2	**Sets and subsets:** • 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. • Problems	10
Unit- 3	**Relations & Function:** • Definition of Cartesian product , relation • Types of relation • Matrix representation of relation • Graphical representation of relation • In-degree and out-degree of a vertex • Transitive closure: Warshall's algorithm • Equivalence relation • **Function:** • Definition of function as relation • Types of Function- ➢ Injective function (1-1 Function) ➢ Surjective function (Onto Function) ➢ Bijective function ➢ Inverse function.	14

	• Problems	
Unit- 4	**Counting principles:** • Cardinality of set • Pigeonhole principle • Addition principle • Multiplication principle • Inclusive-exclusive principles for two sets & three sets. • Problems	12

Unit- 5	**Graphs:**
	• Definition and elementary results
	• Types of graphs- Simple graph, Multi-graph, pseudo graph, complete graph, Null graph, Regular graph, Bipartite graph, complement of a graph
	• Adjacency and incidence matrix.
	• Derived graphs:
	   ➢ Sub graphs
	   ➢ Vertex deleted & edge deleted sub graphs
	   ➢ Vertex disjoint & edge disjoint sub graphs
	• Operations on graphs- Union, Intersection, Ring sum of two graphs
	• Problems
		12

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: BCA 106   **Course Title: Lab 1 Based on 101, 102, 103, 105**

Total Contact Hours: 48 Hrs.   **Total Marks: 100   (60 Practical's)**

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

Lab- 1

I) Practical's on course code BCA 101:

Unit Name	Description
DOS	Internal Commands-Date, Time, Dir, Copy, Del, Ren, Cls, Path, type, mkdir, chdir, rmdir, External Commands- Format, Find, Chkdsk Disk copy, Backup, Dos key
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 2007	a. MS-Word b. MS-Excel c. MS-PowerPoint d. MS-Access

II) Practical's on course code BCA 102:

Unit Name	Description
Input-output statements	Write different programs in 'C' language that shows use of basic input-output statements.
Operators	Write different programs in 'C' language that shows use of operators.
Control statements	Write different programs in 'C' language that shows use of various control statements.
Array	Write different programs in 'C' language that shows use of different types of arrays.
Functions	➢ Write different programs in 'C' language that shows use of different types of Functions. ➢ Write different programs in 'C' language that shows use of recursion Functions.

III) Practical's on course code BCA 103:

Unit Name	Description
Tally	➢ Creation, alteration and deletion of company ➢ Recording transactions ➢ Creation of ledgers and groups ➢ Creation of voucher types ➢ Creation of different reports using tally software. ➢ Solve or implement real life industry examples using Tally software

IV) Practical's on course code BCA 105:

Write a programme using 'C' on mathematical concepts (related to theory syllabus) .

First Year BCA (Under Science) Semester- II

Course Code: BCA 201   **Course Title: Advanced Programming in 'C'**

Total Contact Hours: 48 Hrs.   **Total Marks: 100   (60 Lectures)**

Teaching Scheme: Theory 5 Lect./Week   **Total Credits: 04**

Course Objective: The objective of this course is to study advanced programming in 'C'

Unit No.	Description	No. of Lectures
Unit- 1	**Preprocessor directives:** • 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 (\\)	12

Unit- 2	**Pointers:**
	• Declaration, definition, initialization & use of pointer
	• Pointer Arithmetic
	• Relationship between Arrays & Pointers
	• Pointer to array
	• Array of pointers
	• Multiple indirection (Chain of pointer)
	• Functions & pointers
	• Passing pointer to function
	• Returning pointer from function
	• Pointer to function.
	• Parameter passing mechanism (Pass by value & pass by pointer)
	• Generic pointer.
	• Introduction, definition, advantages of dynamic memory allocation
	• Introduction to alloc.h header file
	• Dynamic memory allaction functions-
	   ➢ malloc( )
	   ➢ calloc( )
	   ➢ realloc( )
	   ➢ free( )
		13

Unit- 3	**String:** • Introduction & definition of string • Declaration & initialization of string • Inputting & outputting string using gets( ) and puts( ) • Table of string • Pointer to string. • Traversing string through its pointer. • Passing & returning string from function through its pointer • Introduction to string.h header file. • string handling functions- strlen( ), strcat( ), strrev( ), strcpy( ), strcmp( ), strlwr( ), strupr( ), strstr( ) etc. of string.h header file.	11
Unit- 4	**Structure:** • Concept of structure • Declaration and definition of structure • Initialization of structure variable. • Accessing structure members using (. operator) • Array of structure • Pointer to structure • Accessing structure members via pointer to structure using (-> operator) • Passing entire structure to user defined function • Returning entire structure from user defined function • Passing structure by value and address • Nested structures • Self referential structure. **Union:** • Concept of union • Declaration, definition of union • Accessing union members • Difference between Structures & unions	12
Unit- 5	**File Handling:** • Introduction & definition of file • Need of file • File opening modes • Types of files • Binary & text files • Random access to files • File handling functions: • fopen( ),fgetc(), fputc(), getw(),putw(),feof(),fgets(),fputs() fprintf(),fscanf(),ftell(),rewind(),fclose() etc. • Introduction to Command line arguments	12

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

Course Code: BCA 202   **Course Title: Web Technology**

Total Contact Hours: 48 Hrs.   **Total Marks: 100   (60 Lectures)**

Teaching Scheme: Theory 5 Lect./Week   **Total Credits: 04**

Course Objective: The objective of this course is to study basics of web technology.

Unit No.	Description	No. of Lectures
Unit- 1	**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 formatting tag, Anchor tag, Lists, Image, Image Map, Table, Frames and Frameset, Form, get and post method, input tag. • HTML5- • Introduction to HTML5 • Need of HTML5 • DOCTYPE Element • Tags-Section, Article, aside, header, footer, nav, dialog, figure etc. • Events in HTML5, • Input tag in HTML5- (Type, Auto focus, placeholder, required etc. attributes.) • Graphics in HTML5 • Media tags in HTML5	10
Unit- 2	**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.	15
Unit- 3	**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- 4 | **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 | 20 |

Books Recommended:
1) HTML5 Black Book-   Kogent Learning Solutions Inc   Dreamtech.
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: BCA 203   **Course Title: <u>Software Engineering</u>**

Total Contact Hours: 48 Hrs.   **Total Marks: 100   (60 Lectures)**

Teaching Scheme: Theory 5 Lect./Week **Total Credits: 04**

<u>Course Objective:</u> The objective of this course is to study basics of software engineering.

Unit No.	Description	No. of Lectures

Unit- 1	**System concepts:**
	• Definition & concept of system
	• Elements of system
	• Types of system-
	  ➢ Deterministic & probabilistic system
	  ➢ Open & closed system
	  ➢ Transaction processing system
	  ➢ Management information system
	  ➢ Decision support system
	  ➢ Executive information system
	• Role of System Analyst
	Software Engineering:
	• Definition of software engineering
	• Characteristics of software
	• Qualities of software
		11

Unit- 2	**System Development Life Cycle:**
	• System Development life cycle (SDLC)
	• Models of SDLC-
	  ➢ Classical model
	  ➢ Spiral model
	  ➢ Waterfall model
	  ➢ Prototypingmodel
	Requirement Analysis:
	• Requirement Anticipation
	• Requirement investigation
	• Requirement specifications
	• Feasibility study
		14

Unit- 3	**Fact finding techniques:**
	  ➢ Interviews
	  ➢ Questionnaire
	  ➢ Record reviews
	  ➢ Observation
	• Study of physical system
	• Identifying the data used
	• Identifying the controls
	• User transaction Requirements
	• User design requirements
	• Organization dependent requirements
		10

Unit- 4	**Analysis and Design Tools:**
	• Flow charting
	• Decision tree
	• Decision Tables
	• Structure charting Techniques(HIPO)
	System Design:
	• Entity relation Analysis-
	    ➢ Entity
	    ➢ Attribute
	    ➢ Relationship
	    ➢ Types of relationship
	• Normalization and its types-
	    ➢ 1NF (1st Normal Form)
	    ➢ 2NF (2nd Normal Form)
	    ➢ 3NF (3rd Normal Form)
	• Input, output design
	• File design-
	Concept & types of file.
	• Data flow Diagram-
	    ➢ Context Level Diagram
	    ➢ Data flow diagram (Physical, Logical)
	Data Dictionary:
	• Concept and features of Data Dictionary
		12

Unit- 5	**Configuration and Construction of the System:** • Collection of system statistics • Setting Sub-system Boundaries • Fractional Approach • Incremental Approach **Case studies:** • College Admission System • Mark sheet printing System • Pay Roll • Library System • Bank Fixed Deposit (FD) system	13

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

Course Code: BCA 204   **Course Title: <u>Digital Electronics</u>**

Total Contact Hours: 48 Hrs.   **Total Marks: 100**   **(60 Lectures)**

Teaching Scheme: Theory 5 Lect./Week   **Total Credits: 04**

<u>Course Objective:</u> The objective of this course is to study of Digital electronics.

Unit No.	Description	No. of Lectures

Unit- 1	**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 generator
		15

Unit- 2	**Memory:** • Memory Architecture • Memory Hierarchy • Introduction to USB storage device • Memory parameters (Access time, speed, capacity, cost) • Vertical & horizontal Memory expansion (increasing the capacity, increasing word size) • Associative Memory • Cache memory • Cache mapping techniques • Virtual memory • Virtual memory mapping (paging and segmentation)	14

Unit- 3	**Computer Organization:**
	• Concept of Address Bus, Data Bus, Control Bus
	• Register based CPU organization
	• Stack organization
	• I/O organization:
	  ➢ Need of interface
	  ➢ Block diagram of general I/O interface
	• Working concepts like polling, interrupt initiated data transfer
	• Concept of DMA
	• DMA transfer
	• DMA Controller Serial communication:
	  ➢ Synchronous, asynchronous and their data transmission formats
	• RS–232
	• General block diagram of UART
		16

Unit- 4	**Microprocessor:** • Pin Dig. And Block Dig. of 8086 • Evolution of Microprocessor (8086 to Pentium 4) • Features like address, data, bus size, speed, cache capacity, number of parallel instructions executed • Concept of RISC & CISC • Von-Neumann & Harvard Architecture • Concept of pipeline. • Architecture of basic microprocessor: 3 • 8086 & Pentium (Basic Version) • Introduction to multicore processors, its development • It's impact on Hardware and Software.	15

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) Computer System Architecture : Morris Mano, Prentice-Hall of India
5) The Pentium Microprocessor : James Antonakos
6) The Intel Microprocessors : Barry B. Brey- Pearson Education Asia
7) Digital Electronics- C.F. Strangio
8) Modern Digital electronics- R.P. Jain

Course Code: BCA 205 **Course Title: <u>Computer Oriented Statistics</u>**

Total Contact Hours: 48 Hrs. **Total Marks: 100** **(60 Lectures)**

Teaching Scheme: Theory 5 Lect./Week **Total Credits: 04**

<u>Course Objective:</u> The objective of this course is to study the Computer oriented statistics.

Unit No.	Description	No. of Lectures
Unit- 1	**Population & Sample:** Concept of statistical population, Sample with illustration, census method, limitation of census method, Sampling, advantages of Sampling, methods of sampling- SRS, Stratified, Systematic (Description only) **Data Condensation & Graphical Methods:** Raw data, attribute, variable, constant, discrete & continuous variable, classification, principles of classification, objective of classification, construction of frequency distribution, inclusive and exclusive classes, relative & cumulative frequency distribution, graphical representation of data- Histogram, Ogives	15
Unit- 2	**Measures of central tendency:** Concept, objectives, criterion for good measures of central tendency, A.M.- Definition, formula for computation for ungrouped and grouped data, combined A.M, Weighted A.M, Merits & demerits, Median- Definition, formula of computation for ungrouped and grouped data, graphically determination, merits and demerits. Mode- definition, formula of computation for ungrouped and grouped data, graphically determination, merits and demerits. Empirical relation between Mean, Median & Mode, Numerical problems	10
Unit- 3	**Measures of Dispersion:** Concept, absolute and relative measures of dispersion. Range- Definition, Computation of range, coefficient of range, merits and demerits. Variance- Standard deviation, coefficient of variation- definition, formula for computation, merits and demerits, numerical problems.	9
Unit- 4	**Correlation (For Ungrouped data):** Bivariate data, concept of correlation, types of correlation, cause & effect relation. Scatter diagram method, Karl Pearson's coefficient of correlation, numerical problems. **Regration (For Ungrouped data):** Concept, lines of regression, derivation of lines of regression by least square method, properties of regression coefficient (Statement only), numerical examples	8
Unit- 5	**Index Number:** Need of index number, problems in construction of index number, unweighted and weighted index number, price and quantity index number by Laspeyre's, Passche's and Fishers formula, numerical problems	9
Unit- 6	**Probability:**	9

	Sample space, event, types of events, classical definition, conditional probability, addition and multiplication laws of probability (statement only), simple examples (without use of permutation and combination)	

Books Recommended:
1) Fundamentals of Statistics- S.C. Gupta
2) Statistical Methods- S.P. Gupta
3) Business statistics- Suranjan Shaha
4) Fundamentals of mathematical statistics- Kapoor & Gupta

Course Code: BCA 206 **Course Title: Lab 2 Based on 201, 202, 204, 205**

Total Contact Hours: 48 Hrs. **Total Marks: 100** **(60 Practical's)**

Teaching Scheme: Practical 08 Lect. /Week **Total Credits: 4**

Lab- 2

I) Practical's on course code BCA 201:

Unit Name	Description
Preprocessor directives	Write different programs in 'C' language that shows use of basic preprocessor directives.
Pointer	Write different programs in 'C' language that shows use of pointers, dynamic allocation functions etc.
String	Write different programs in 'C' language that shows use of various string handling functions.
Structure & union	Write different programs in 'C' language that shows use of structure & union. (With pointers & function also).
File Handling	Write different programs in 'C' language that shows use of different file handling functions. (Sequential access also random access)

II) Practical's on course code BCA 202:

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 different web pages that uses JQuery.

III) Practical's on course code BCA 204:

Write & implement some electronics concepts (related to theory syllabus) using 'C' language.

IV) Practical's on course code BCA 205:

Write & implement some statistics concepts (related to theory syllabus) using 'C' language.