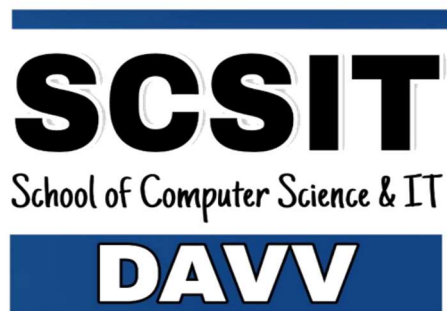# SYLLABUS

Bachelor of Computer Applications

1st SEMESTER

Mission of SCS&IT, DAVV

To produce world-class professionals who have excellent analytical skills, communication skills, team building spirit and ability to work in cross cultural environment.

To produce international quality IT professionals, who can independently design, develop and implement computer applications.

Professionals who dedicate themselves to mankind, who are environment conscious, follow social norms and ethics.

School of Computer Science & IT,
Devi Ahilya Vishwa Vidyalaya, Indore
www.scs.dauniv.ac.in

Course Name: **BCA 1st Semester**

Subject Code: **CS-3207**

Subject Name: **Object Oriented Programming Through C++ - I**

Aim of the Subject

Aim of this course is to understand and solve logical & amp; mathematical problems through C++ language. Strengthen knowledge of a object oriented programming language. Design and develop solutions to intermediate level problems using the C++ language. Further develop skills in software development using object oriented language.

Learning Outcomes

The students are expected to learn following after completion of the course:

- Know the basic concepts of computer system and its generations.
- Be able to break a large problem into smaller parts, writing each part as a module or a function.
- Be able to use an array to store multiple pieces of homogeneous data and use a structure to store multiple pieces of heterogeneous data
- Introduce the concept of Pointers Structures, Union, Class and object.

Unit 1

Introduction to Computer-Based Problem Solving : Problem Identification, Definition and Problem Solving Strategies. Program, Features of Good Program. Procedural Programming, Structured Programming and Object Oriented Programming, Classification of Programming Languages: Low-level, High –level language, Programming Environment: Assemblers, Compiler, Interpreter, Linker, Loader. Program Design with Flow chart and Algorithm : Symbols in flowcharts, Importance of Flowchart, Writing algorithm, Importance of Algorithm, Developing and debugging flowchart for programming problem

Unit 2

Fundamentals of Object Oriented Programming : Overview of C++, History of C++, Structure of a C++ Program, C++ character set, Identifiers and Keywords, Data types, Primitive data types in C++, Choosing data type, Variables and Constants, Variable declaration and initialization, Constant declaration. Operators and Expressions: Arithmetic operators, Logical operators, Relational operators, assignment operator and conditional operators, Expression, Implicit and explicit type conversion, Evaluation of expression (Precedence and Associativity)

Unit 3

Basic Input/Output Operations: Formatted I/O, Unformatted I/O, getchar( ), putchar(), gets() and puts() functions. Control Constructs: Sequence Control Structure, if-else statement,

switch-case statement, Loop Control Structure, while loop, do-while loop, for loop, Jump Statements, break, continue, goto, return, Local and Global variables, Qualifiers effecting scope and visibility of variables: Static, Auto, Extern and Register variables, Operators in C++, manipulators

Unit 4

Array: Array Declaration and initialization, Array operations (like traversal, searching an element, sorting array elements), 2 D Array and multidimensional array, Declaration and initialization, Matrix operations, Advantages and limitations of Array. String: String declaration, String manipulation, String functios. Structure and Union: declaration, definition, access member

Unit 5

Function: User defined Function, Function declaration, definition and call, Actual and formal arguments, Function with arguments and without arguments, Communication between functions. Introduction to class: Class specification, Access class member, access specifiers in C++ : Public, Private and Protected data member and member functions, Defining a member function of a class outside the class using scope resolution operator.

Text Book(s)

Tony Gaddis, Starting out with C++: from control structures through objects (7e)

Reference Material(s)

1. B. Lippman, C++ Primer

2. Bruce Eckel, Thinking in C++

3. K.R. Venugopal, Mastering C++

4. Herbert Schildt, C++: The Complete Reference

5. Bjarne Stroustrup, The C++ Programming Language

6. Sourav Sahay, Object Oriented Programming with C++

Course Name: **BCA 1st Semester**

Subject Code: **CS-1004**

Subject Name: **Introduction to Computer Fundamentals**

Aim of the Subject

To know the basics of computer along with its operations.

Learning Outcomes

The students are expected to learn following after completion of the course:

- Know the basic concepts of computer system and its generations.
- Acquaint the students with the number system.
- Basic knowledge of Input Output devices and storage units.
- Adequate knowledge to understand the various software and programming language.
- Exposure of various communication model and network types.

Unit 1

Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilities and limitations, Types of computers Generations of computers, Personal Computer (PCs) - evolution o f PCs, configurations of PCs- Pentium and Newer, PCs specifications and main characteristics. Basic components of a computer system- Control unit, ALU, Input/output functions and characteristics, memory - RAM, ROM, EPROM, PROM and other types of memory.

Unit 2

Number System - Introduction, Digital and Analog Operations, Binary Data, Binary Number System, Decimal Number System, Octal Number System, Hexadecimal Number System, conversions from one base to another base.

Codes: ASCII code, EBCDIC code, Gray code. Boolean algebra, De -Morgan's theorem.

Binary arithmetic: addition, subtraction, multiplication & division, unsigned binary numbers, signed magnitude numbers, 1's complement & 2's complement representation o f numbers.

Logic gates: AND, OR, NOT, NANO, NOR, X -OR and X -NOR gates, their symbols and truth tables.

Unit 3

Input/output & Storage Units: Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size,

Resolution, Refresh Rate, Interlaced / Non- Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc., Printers & types - Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Storage fundamentals - Primary Vs Secondary , Various Storage Devices - Magnetic Tape,

Magnetic Disks, Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD-R, CD-RW, Zip Drive, flash drives Video Disk, Blue Ray Disc, SD/MMC Memory cards.

Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD- R, CD-RW, Zip Drive, flash drives Video Disk, Blue Ray Disc, SD/MMC Memory cards.

Unit 4

Software and its Need, Types o f Software - System software, Application software,

System Software- Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Introduction to operating system for PCs-

DOS Windows, Linux.

Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits, Application Software and its types - Word-processing, Spreadsheet, Presentation Graphics, Data Base Management Software, characteristics, Uses and examples and area of applications o f each o f them, Virus working principles, Types of viruses, virus detection and prevention.

Unit 5

Use of communication and IT, Communication Process, Communication types- Simplex, Half Duplex, Full Duplex, Types o f Network - LAN, WAN, MAN. Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies.

Components of LAN - Media, NIC, NOS, Bridges, HUB, Routers, Repeater and Gateways.

Internet-Evolution, World Wide Web Internet Services, Convergence of technologies.

Text Book(s)

Pradeep K Sinha, Priti Sinha, Computer Fundmentals, Sixth Edn. BPB Publications

Reference Material(s)

1. S. K. Basandra, "Computers Today", Galgotia Publications.

2. Alexis Leon & Mathews Leon, "Fundamentals of Information technology", Vikas

Publishing House, New Delhi.

3. V. Rajaraman, Neeharika Adabala, Computer Fundamentals, PHI.

Course Name: **BCA 1st Semester**

Subject Code: **CS-1019**

Subject Name: **Basic Electricals and Electronics**

Aim of the Subject

To provide an overview of evolution of electrical and electronics along with working principal of fundamental electronic devices and circuits.

Learning Outcomes

The students are expected to learn following after completion of the course:

- Knowledge regarding the various laws and principles associated with electrical system.
- knowledge regarding electrical machines and apply them for practical problems.
- Acquire knowledge in using the concepts in the field of electrical for projects and
- research.

Unit 1

Circuit concepts: voltage, current, power and energy, circuit, network component (active and passive, unilateral or bilateral , linear and nonlinear , lumped or distributed) . Resistance parameter, inductance parameter, capacitance parameter, Series and parallel elements. Energy sources (voltage source and current source), voltage and current relations.

DC resistive circuits: Kirchhoff' s voltage law, Kirchhoff' s current law, Practice with Examples. Voltage Division and Current Division, Series –Parallel Network Reduction Power in a Series Circuit, Power in Parallel Circuit.

Unit 2

Network theorems : Star –Delta transformation , Ex. 1& 2 superposition theorem Explanation with example . Thevenin's theorem , Practice with Example maximum power transfer theorem. DC mesh and node Analysis : Mesh analysis with Example. Norton' s theorem , Practice with Example. Mesh equation by inspection method. Nodal analysis, node equation by inspection method. Source transformation technique.

Unit 3

Circuit Transients: Introduction initially charged RC circuit, RL circuit with initial current. Time Constant, Equivalent RC or RL Circuits RL and RC Circuit with Sources. Series RLC Circuit: Overdamped, Critically Damped, Underdamped Condition. Example on RLC Circuit Two Mesh Circuits. Sinusoidal Circuit analysis: Introduction, sinusoidal voltage and current (instantaneous value , peak value, peak to peak value, average value, root mean square value, peak factor, form factor.

Unit 4

Element responses (phase relation in a pure resistor, inductor and capacitor). Series RL sinusoidal Response , Example. Phasors : Phasors as Complex Numbers. Series RC Sinusoidal Response , Example. Power and Power Factor : Instantaneous Power, Average Power, Apparent Power and Power Factor , Reactive Power, Power Triangle.

Unit 5

Introduction o f Digital Electronics : Analog representation, Digital representation . Digital and analog systems: Advantages and Limitations o f digital techniques. Digital Number Systems: Decimal system , Binary System , Binary Counting . Representing Binary Quantities, Digital Circuits/ logic circuits, Parallel and serial Transmission.

Digital Computers: Block Diagram o f Digital Computers, Major Part of Digital Computers. Digital Logic Gates: AND, OR, Inverter, Buffer, NAND, NOR, Exclusive- OR, Exclusive-NOR: Graphic symbol, algebraic function, Truth Table. Cascading of Gates

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Text Book(s)

1. Electric circuits, Schaum's Outline Series

2. udhakar and Shyammohan, Circuits and Networks, McGraw-Hill Education.

3. Introduction to Electrical , prof K.P. Mohandas

4. Digital Electronics, Anil K. Maini

5. Electrical Engineering, Darren Ashby

Reference Material(s)

1. B. L. Theraja, Electrical Technology, S. Chand Publication

2. D. P. Kothari and I. J. Nagrath, Basic Electrical Engineering, McGraw-Hill Education

3. M. Morris Mano, Digital Design, Third Edition, Prentice Hall

Course Name: **BCA 1st Semester**

Subject Code: **IC-1924**

Subject Name: **Hindi Language**

Aim of the Subject

हिंदी भाषा और सम्प्रेषण कौशल में वृद्धि

Learning Outcomes

The students are expected to learn following after completion of the course:

- विद्यार्थी की अपनी भाषा, समाज, इतिहास, संस्कृति और प्रकृति आदि के प्रति रागात्मक
- दृष्टि विकसित होगी

Unit 1

(क) मानक हिंदी भाषा

(ख) अशुद्धियाँ और उनका संशोधन

Unit 2

(क) हिंदी का शब्द-भण्डार, (ख) हिंदी की वाक्य-रचना और विराम चिह्न

Unit 3

पत्र लेखन, सार-लेखन और पल्लवन

Unit 4

(क) भारत देश और उसके निवासी, (ख) भारतीय समाज की संरचना, (ग) सामजिक गतिशीलता, (घ) धर्म और दर्शन

Unit 5

(क) भातीय संस्कृति का विश्व पर प्रभाव, (ख) मध्यप्रदेश का सांस्कृतिक वैभव

Text Book(s)

भारतीयता के अमर स्वर

Reference Material(s)

Course Name: **BCA 1st Semester**

Subject Code: **CS-1101**

Subject Name: **Mathematics – 1**

Aim of the Subject

To provide mathematical background to the students so that they can understand the importance of mathematics in computer science.

Learning Outcomes

The students are expected to learn following after completion of the course:

- Basic knowledge of differential calculus and integral calculus.
- Ability to solve differential equations and matrices.
- Adequate knowledge to understand the boolean algebra.
- Ability to understand the applications of mathematics in computer science.

Unit 1

Basic of calculus, Maclaurin's and Taylor's series, Partial differentiation, Euler's theorem and its application in approximation and error, Maxima and minima of two variables, tangents and normals, subtangent and subnormal, Curvature, radius of curvature, centre of curvature (Cartesian and polar co-ordinates)

Unit 2

Definite integral as limit o f a sum, Application in Summation of series, Double and Triple integrals, change of order of integration, beta and gamma functions. Length of the curve, volume and surfaces, using double and triple integral.

Unit 3

Ordinary differential equation o f first order, linear and higher degree, Linear higher order differential equation with constant coefficients. Homogeneous linear differential equation, simultaneous differential equations.

Unit 4

Rank of matrices, solution of simultaneous equation by elementary transformation, consistency of equation. Eigen value and Eigen vectors, Cayley-Hamilton theorem and its application to find the inverse.

Unit 5

Algebra of logic, Boolean algebra, principal o f duality, basis theorems, Boolean expression and function. Graph theory, Graphs, Sub-graphs, degree and distance, Tree, Cycles and Network, Elementary concept of fuzzy logic.

Text Book(s)

Engineering Mathematics I, Dr. D.C. Agarwal, Fifth Edition, Published by Shree Sai Prakashan

Reference Material(s)

1. Higher Engineering Mathematics – Dr. B. S Grewal, 36th Edition, Khanna Publishers, 2001. ISBN: 8174091157, 9788174091154

2. Higher Engineering Mathematics – B V Ramana. Tata McGraw-Hill Education, 2006, ISBN: 007063419X, 9780070634190

Course Name: **BCA 1st Semester**

Subject Code: **IC-1905**

Subject Name: **English Language and Composition**

Aim of the Subject

To improve english language proficiency of students.

Learning Outcomes

The students are expected to learn following after completion of the course:

- Basic knowledge of language skills.
- Knowledge regarding vocabulary, sentence formation.
- Adequate knowledge to understand literature and paragraph writing.

Unit 1

literature

1. Where the Mind is Without Fear

2. A Hero

3. Tryst With Destiny

4. Indian Weavers

5. The Portrait o f a Lady

6. The Solitary Reaper

Unit 2

Basic Language Skills:

Countable and Uncountable Nouns, Verbs, types of verbs , Tenses, determiners, adjectives

Adverbs, prepositions , conjunctions.

Unit 3

Basic Language Skills:

Vocabulary: Synonyms, Antonyms, Word Formation, Prefixes, Suffixes, Confusing Words, Misused Words, Similar Words with Different Meanings.

Unit 4

Sentence , hierarchy o f sentence, phrases, types of phrases, classification of sentence based on function and structure, parts of sentences.

Unit 5

Composition and Paragraph Writing, types of paragraph, descriptive paragraph

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Text Book(s)

English Language and Literary Heritage of India, Foundation course (English Language) Published by Commission for Scientific and Technical Terminology and M P Hindi Granth Academy Edition first (2017)

Reference Material(s)

English usage- Michael swan, English grammar and composition Wren and martin

Course Name: **BCA 1st Semester**

Subject Code: **CS-1905**

Subject Name: **English Language Lab**

Aim of the Subject

TO DEVELOP PROFICIENCY IN ENGLISH LANGAUGE

Learning Outcomes

The students are expected to learn following after completion of the course:

- STUDENTS WOULD BE ABLE TO USE LANAGUGE AND ITS SKILLS PROFICIENTLY.

Unit 1

PHONETICS :

LISTENNG SKIILLS: UNDERSTANDING LISTENING, TYPES OF LISTENING AND STRATGIES OF LISTENING. PRACTICE

SPEECH SOUNDS:SPEECH ORGANS CONSONANTS AND VOWELS, CLASSIFICATION OF CONSONANTS AND VOWELS.

SPELLING RULES, PRONUNCIATION PRACTICE,

Unit 2

LISTENNG SKIILLS: UNDERSTANDING LISTENING, TYPES OF LISTENING AND STRATGIES OF LISTENING. PRACTICE

Unit 3

SPEAKING SKILLS: ABILITY TO SPEAK BEFORE AUDIENCE, SKILLS OF PRESENTATION

GROUP DISCUSSION

Unit 4

READING SKILLS: TO DECODE THE MEANING, VARIOUS READING SKILLS; SKIMMING, SCANNING, INTENSIVE AND EXTENSIVE READING. DRAWING INFERENCE. CONSTRUCTING MEANING. CONTEXTUAL MEANING

Unit 5

WRITING SKILLS: ABILTY TO DRAFT LETTERS, EMAIL, ETC.

Text Book(s)

A TEXTBOOK OF ENGLISH PHONETICS FOR INDIAN STUDENTS: T BALASUBRIMANIAN

Reference Material(s)

BETTER ENGLISH PRONUNCIATION J.D. CONNOR