

BACHELOR OF COMPUTER APPLICATION (BCA)

Program Outcome:: Program Specific Outcome ::Course Outcome

PROGRAM OUTCOME (PO)

Bachelor of Computer Application is an Undergraduate degree program catering the need of the high demand of computer professionals in the country in the present context. For the rapid growth of IT industries in the country in the last couple of years, this program has become very important and relevant for the current and future generation. It enhances ability and competence of the learners to work as an IT professional in practical field. BCA program enables the youngster to achieve the following outcome on successful completion of their course:

- Ability to understand and apply mathematical, computational and domain knowledge in real life problems
- Ability to identify and analyze complex problems using fundamentals of computer science and application domains.
- Proficiency to transform modern complex business scenario and contemporary issues into integrated hi-tech solutions using emerging technologies.
- Ability to work out experiments, interpret data and provide well informed conclusions.
- Aptitude to select modern computing tools and techniques necessary for innovative software solutions
- Ability to apply professional ethics and cyber regulations in a global economic environment.
- Propensity to engage in continuous learning as a Computing professional in the ever changing technological environment
- Skill to communicate effectively with the computing community as well as the society through effective documentations and presentations.
- Ability to identify opportunities and value entrepreneurial vision and work as a member or leader in diverse environment.



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PROGRAM SPECIFIC OUTCOMES (PSO)

BCA Program is designed to prepare the learners in achieving the following Specific Outcomes:

PSO1: It explores technical comprehension in varied areas of Computer Applications and cultivates skills for thriving career and higher studies.

PSO2: It enables building up knowledge in different computer programs in the allied areas like Algorithms, System Software, Multimedia, Web Design and Data Analytics for efficient design of computer-based systems of varying complexity.

PSO3: It develops programming skills, networking skill, programming language and modern techniques of IT.

PSO4: It enables the learners to mastering over computer graphics, web development, trouble shooting and different hardware and software skills

PSO5: It equips the learners to become employable in the field of computer applications with a flare knowledge on different IT skills and programs.

PSO6: It also opens up the opportunities of self-employment in different fields of computer applications.

PSO7: It meets the requirements of the Industrial standards by bossing the knowledge starting from the basics of C, C++, Java, Python along with SQL to the recent Software Codes on Big data.

PSO8: It provides solution mathematically about basic discrete structures such as numbers, sets, used in computer science.

PSO9: It familiarises the learners with mathematical Determinant and Matrices, Limit, Continuity and Differentiability.

PSO10: It leads to handle the practical computational field along with direct codes like ALP etc for programming with Microprocessors.



BACHELOR OF COMPUTER APPLICATION (BCA)

Course Outcome

Course Name: Bachelor of Computer Application(BCA)

Course Completion Time: 3 years (6 Semester)

Semester	Paper Code and Name	Outcome
1 st	BCA 1101 Computer Fundamentals and application software	<ol style="list-style-type: none">1. To be able to recognize all the hardware components and the peripheral devices2. To be Familiar with different software applications.3. Understanding mamory of a computer and its Components4. Familiarizing with different web applications like E mails etc
	BCA 1102 Programming in “C” & BCA 1196 C Programming Laboratory	<ol style="list-style-type: none">1. Learning the basic terminologies to be familiarized with C programming.2. Learning data types and variables3. To be able to learn how to write C programs4. Learning conditions and loops5. Familiarizing with array and pointers with proper C programs.6. Having a proper knowledge on Files using C programs. <p>Lab Work:</p> <ol style="list-style-type: none">1. Learning Numerical problem.2. To get to know Statistical problem.3. Learning Search and sorting problem.4. Knowing String manuoulation5. Solving Problems
	BCA 1103 Discrete Mathematics with application to computer science	<ol style="list-style-type: none">1. To be able to learn all about Set theory with Relations and functions2. Learning Venn Diagram and laws of set theory3. Familiarizing with basic definitions of relations and functions.4. To be able to Rule of products, permutations, combinations, Algebra of Logic5. Learning Algebraic Structures, Boolean Algebra6. To gain knowledge regarding problem solving techniques.

	Paper Code and Name	Outcome
1st	BCA 1104 Digital Electronics	<ol style="list-style-type: none"> 1. Learning Data and number representation- binary-complement representation BCD-ASCII, Gray Code 2. To be able to know Code Conversion Learning Logic gates, basic logic operations, truth tables, Boolean expression 3. Learning the use of K Map 4. Learning .Combination circuits, adders, Subtractor, Decoder, encoder, Multiplexer, Sequential circuits, flip-flops, Registers, counter (Async & Sync).
	BCA 1197 Digital Electronics Lab	<p>To be able to know how to acquire practical knowledge on :</p> <p>Combinational and sequential circuit design using I-C, & NOR, NAND GATES, their usage and related mathematical problems</p>
	BCA 1195 Communication Skill and Language Laboratory	<p>To be able to enhance communication skill know</p> <p>(i) Vocabulary by knowing</p> <ol style="list-style-type: none"> a) Spelling of words (Orthographical) b) Semantic and phonetic aspect says words. Synonym/Antonym/ Homonym. <p>(ii) Basic grammar and Grammar of words</p> <ol style="list-style-type: none"> a) Sentence form (SVO, SVA), Question form, and Negative form. b) Tense and time. Number concepts-Singular, Plural, Collective, and Distributive. c) Verb manipulation-Passive Voice, Question tag, indirect narration, Cansative Conditionals. d) Agreement-Noun, Pronoun, Subject, Verb. Completion of Prediction-Object, Complement, Other Grammar objectives Learning Expression and Writing Skills.

Semester	Paper Code and Name	Outcome
2nd	BCA 1201 Computer Organization and Architecture	<ol style="list-style-type: none"> 1. To be able to learn combinational and sequential circuits 2. To know all kinds of operations of Boolean algebra 3. Learning pipelining methods along with its mathematical performance measurement 4. Learning different kind of pipeline hazards and their solutions 5. Familiarization with memory organization and their architectural diagrams 6. Learning virtual memory, registers 7. To be able to know different kinds of instructions

2nd		8. To know about control unit and its function
	Paper Code and Name	Outcome
	BCA 1202 Data Structure	<ol style="list-style-type: none"> 1. To know how to familiarize with the basic ideas of Data structure and Algorithms. 2. Having knowledge of different Data structure like – Array , Linked list etc. 3. Learning application of Stack and Queue 4. Implementation of Stack and Queue as Array and Linked list 5. Learning Trees and Graphs 6. Learning different types of Algorithms 7. To be able to know about different Searching and Sorting methods 8. To know about Hashing
	BCA 1203 Mathematical Foundation for Computer Science	<ol style="list-style-type: none"> 1. To know all the basics of Classical Algebra 2. To be able to gain knowledge between roots and co-efficient up to 4th degree polynomial equation 3. Learning Linear Algebra 4. To know Linear independence and dependence of Vectors 5. To gain knowledge on Eigen Vector and Eigen value 6. Learning cayley-Hamilton theorem 7. To gain knowledge on Matrix multiplication and other operational matrices 8. To know Differential Calculus 9. To know Integral Calculus 10. To know about Mathematical probability
	BCA 1204 Financial and Management Accounting	<ol style="list-style-type: none"> 1. To know about Conceptual Framework of Accounting 2. To gain knowledge on Identifying and recording accounting transaction using traditional and accounting equations approach. 3. To know whereabouts of Capital and Revenue items 4. To be able to learn Fundamentals of Computerized Accounting System 5. To learn to maintain the hierarchy of ledger accounts forpreparing control accounts.
	BCA 1205 System Analysis and	<ol style="list-style-type: none"> 1. To acquire knowledge on Overview of System Analysis and Design. 2. To be able to learn about the difference between Manual Systemand Automated System 3. To know about the types of Systems, role of System Analyst, System Development Life Cycle and its

2nd	Design	<p>phases</p> <ol style="list-style-type: none"> 4. To know about DFD, Data Dictionary 5. To know the difference between Logical and Physical design 6. Familiarizing with File Organization and Database design 7. To gain knowledge on testing strategies
	BCA 1296 Data Structure Lab	<ol style="list-style-type: none"> 1. Implementation of Lists, Stacks, Queues, and trees with static and dynamic structure.(Using arrays and pointers). 2. Sorting internal and external – heap, merge, quick and bubble sorts of arrays, files and lists. 3. Tree traversal of binary trees. 4. Implementation of Hash table of fixed sizes.
	BCA 1297 Financial Accounting Lab	<p>Learning</p> <ol style="list-style-type: none"> 1. Tally 2. Fact

Semester	Paper Code and Name	Outcome
3rd	BCA 2101 Design and analysis of Algorithm	<ol style="list-style-type: none"> 1. To learn about time and space complexity 2. To learn about asymptotic notation, big O notation, Omega and Theta notation etc. 3. To be able to know about the time complexity of well known algorithms like heapsort, search algorithms etc 4. To be able to familiarize with different kind of algorithm design techniques . 5. To know about all kinds of sorting techniques like merge sort quicksort, heapsort , bubble sort etc. 6. To know about dynamic programming, greedy method, knapsack problem, job sequencing, Prim's and Kruskal's algorithm .
	BCA 2102 System Programming	<ol style="list-style-type: none"> 1. To be able to know about system programming, it's differences with assembly language programming 2. To gain knowledge on different data formats like Role and base register index register etc 3. To know about compilers 4. To know the applications of different grammars of compiler design 5. To gain knowledge on software tools text editors, interpreters, program generators, debug monitors
	BCA 2103 Computer Oriented Numerical method and Statistical method	<ol style="list-style-type: none"> 1. To gain knowledge on approximation in numerical computation 2. To be able to know about interpolation for example language interpolation, forward differences, backward differences etc 3. To be able to learn about numerical integration 4. To know about trapezoidal rule, Simpsons one third rule etc 5. To be able to learn about gauss elimination method 6. To know about algebraic equation like Bisection method 7. To acquire knowledge on a Regula-Falsi method, Newton Raphson method etc

3rd

	<p>BCA 2104 Database Management System</p>	<ol style="list-style-type: none"> 1. To learn about the basics of DBMS 2. To learn about different kind of DBMS users, importance of data dictionary, contents of data dictionary, types of database languages, data models 3. To know about data manipulation and data definition 4. To acquire knowledge on concepts of primary key, foreign key, candidate key etc 5. To know how to create tables 6. To familiarize with different kind of SQL commands 7. To know relational model and definition of relation 8. To acquire knowledge on relational algebra
	<p>BCA 2105 Microprocessor</p>	<ol style="list-style-type: none"> 1. To learn about the introduction of microprocessors 2. To gain knowledge on the block diagram of 8085 microprocessor 3. To know about the Architecture of 8085 microprocessor 4. To know about the instruction cycles machine cycles and T states 5. To know about the 8085 programming by familiarizing with assembly language programming 6. To know about 8085 instruction sets 7. To know about different kind of addressing modes 8. To know the basics of 8085 and 8086 microprocessors and their differences 9. To acquire knowledge on the basic differences of microprocessors and microcontrollers
	<p>BCA 2196 DBMS Lab</p>	<p>Learners will be able to understand:</p> <p>Structured Query Language : 1. Creating Database, : Creating a Database, , Creating a Table, ,Specifying Relational Data Types, Specifying Constraints, ,Creating Indexes.</p> <p>2. Table and Record Handling: INSERT statement ,Using SELECT and INSERT together ,DELETE, UPDATE, TRUNCATE statements, DROP, ALTER statements.</p> <p>3. Retrieving Data from a Database: The SELECT statement, Using the WHERE clause, Using Logical Operators in the WHERE clause Using IN, BETWEEN, LIKE , ORDER BY, GROUP BY and HAVING Clause Using Aggregate Functions, Combining Tables Using JOINS, Subqueries.</p> <p>4. Database Management: Creating Views, Creating Column Aliases ,Creating Database Users ,Using GRANT and REVOKE, Cursors in Oracle PL / SQL ,Writing Oracle PL / SQL Stored Procedures</p>
	<p>BCA 2197 Gr.A: Microprocessor Lab (8085)</p>	<p>Familiarization with 8085 register level architecture and trainer kit and TASM components, including the memory map. Familiarization with the process of storing and viewing the contents of memory as well as registers.</p> <p>2. Study of prewritten programs on trainer kit using the basic instruction set (data transfer, Load/Store, Arithmetic, Logical) Assignments based on above.</p> <p>3. Familiarization with 8085 simulator on PC. Study of prewritten programs using basic instruction set (data transfer, Load/Store, Arithmetic, Logical) on the simulator. Assignments based on above.</p> <p>4. Programming using kit/simulator for i) table look up ii) Copying a block of memory iii) Shifting a block of memory. iv) Packing and unpacking of BCD numbers , v) Addition of BCD numbers , vi) Binary to ASCII conversion , vii)String Matching , viii)Multiplication using Booth's Algorithm ,</p>

3rd	System Programming lab(8086) Gr.B: Numerical Laboratory	<ol style="list-style-type: none"> 1. Solving various problems related programme with C 2. Implement Numerical problems Using C. 3. Assignments on Interpolation: Newton forward & backward, Lagrange . 4. Assignments on Numerical Integration: Trapezoidal Rule, Simson's 1/3 Rule, . 5. Assignments on Numerical solution of a system of linear equation: Gauss elimination, Gauss Jacobi, Matrix Inversion, Gauss Seidel. 6. Assignments on Algebraic Equation: Bisection, Secant, Regula-falsi, Newton Raphson 7. Assignments on Ordinary Differential Equation: Taylor Series, Euler's method, RungeKutta
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Semester	Paper Code and Name	Outcome
4th	BCA 2201 Object Oriented Programming using C++	<ol style="list-style-type: none"> 1. To gain knowledge on object oriented programming language and its properties 2. To be able to understand class and objects 3. To know the whereabouts of constructor and destructor 4. To be able to know about polymorphism, etc 5. To be able to know about conditions and loops 6. familiarizing with C++ coding 7. Learning coding formations and deformations 8. Learning file handling and exception handling 9. Learning pointers and the uses of pointers NS C++ code
	BCA 2202 Operating System	<ol style="list-style-type: none"> 1. Students will be able to understand the basic concept of operating system 2. To be able to know about processes 3. To gain knowledge on process control block and process state models 4. To acquire knowledge on process scheduling and different types of scheduling algorithms 5. To know about deadlocks 6. To know about Different kinds of deadlock avoidance algorithms, recoveries from deadlocks, causes of deadlocks 7. To know about virtual memory technique and different memory organizations 8. To be able to understand PAGING, demand paging, differences between paging and synchronization 9. To know about process synchronization and its techniques 10. To acquire knowledge on page replacement algorithms 11. To be able to understand different operating systems and their uses
	BCA 2203 Operation	<ol style="list-style-type: none"> 1. To know the Characteristics of OR 2. Basics of decision making 3. To learn about Algebraic solution: simplex methods

4th

	<p>Research</p>	<ol style="list-style-type: none"> 4. To be able to understand Transportation Model and its Definition along with formulation and solution of transportation models 5. To know minima, column-minima, matrix-minima and vogel's approximation methods. 6. To gain knowledge on Assignment model with the Definition of assignment model and its comparision with transportation model
	<p>BCA 2204 Software Engineering</p>	<ol style="list-style-type: none"> 1. To be able to understand the basics of software engineering 2. To acquire knowledge on different kind of software development lifecycle models 3. To acquire knowledge on different COCOMO (Constructive cost estimation model) models 4. To be able to understand software engineering principles 5. To be able to acquire knowledge on mathematical problems linked with person month and efficiency 6. To have a havoc idea on software testing 7. To gain knowledge on the basic differences between white box testing and black box testing 8. To be able to know about software quality assurance 9. To familiarize different diagrammatical approach off data flow diagrams 10. Understanding basic differences between data flow diagram and control flow diagram
	<p>BCA 2205 Computer Network</p>	<ol style="list-style-type: none"> 1. Understanding basics of computer networks 2. To be able to know network categories 3. Familiarizing with different network modes 4. To gain knowledge on ISO /OS I model 5. familiarizing with the seven layers of ISO /OSI model 6. Learning different mathematical problems of the physical layer 7. Learning the basics of the TCP /IP protocol 8. Gaining knowledge on the IP addressing methods 9. Having idea on the differences of classful addressing and classless addressing 10. Familiarizing with mathematical problems of IP addressing 11. Learning the basics off Bluetooth and other connectivity.
	<p>BCA 2296 C++ Lab</p>	<p>Learning coding on</p> <ol style="list-style-type: none"> 1. Class, Object, Constructor & Destructor. Class, Modifiers (Private, Public & Protected), DataMember, Member Function, 2. Static Data Member, Static Member Function, Friend Function, Object, Constructor (Default Constructor, Parameterized Constructor and Copy Constructor), Destructor.- Pointer, Polymorphism & Inheritance. Pointer (Pointer to Object, this Pointer, Pointer to Derive Class), Introduction to Polymorphism (Runtime Polymorphism, Compile time Polymorphism), Operator Overloading, Virtual Function, Inheritance (Single Inheritance, Multiple Inheritance, Multilevel Inheritance, Hierarchical Inheritance, Hybrid Inheritance), Virtual Base Class, Abstract Class.- File Handling, Exception Handling. Files I/O, Etc

4th	Paper Code and Name	Outcome
	<p>BCA 2297 Gr.A: Operating System Lab</p> <p>Gr. B: Computer Network Lab</p>	<p>Students will be able to know:</p> <p>Shell programming : creating a script, making a script executable, shell syntax. Process: starting new process, replacing a process image, duplicating a process image , waiting for a process. Signal: signal handling, sending signals, signal interface, signal sets. Semaphore: programming with semaphores (use functions semctl, semget, semop, set_semvalue, del_semvalue, semaphore_p, semaphore_v). POSIX Threads : programming with pthread functions(viz. pthread_create, pthread_join, pthread_exit, pthread_attr_init, pthread_cancel) Inter-process communication: pipes(use functions pipe, popen, pclose), named pipes(FIFOs, accessing FIFO.</p> <p>Socket Programming: Simple Application using elementary socket system calls in client/server model in unix/linux using c language. TCP/UDP example using only the elementary socket system calls.</p>

Semester	Paper Code and Name	Outcome
5th	BCA 3101 OOPS using JAVA	<ol style="list-style-type: none"> 1. Learning the basics of object oriented programming 2. Learning the basics of Java 3. To be able to know the proper programming format of Java 4. To acquire knowledge on Java packages 5. To know the different kinds of Java keywords and variables 6. To know the basic properties of class and object 7. To acquire knowledge on method overloading, constructor overloading 8. To know different kind of exception and exception handling 9. Do note different kind of input output streams
	BCA 3102 Profession Values and Ethics	<ol style="list-style-type: none"> 1. To know the learning effects of technological growth. 2. To know about the energy crisis and renewable energy resources 3. do you know about the value crisis in contemporary society 4. Psychological value of a good life 5. To gain knowledge on moral and ethical values 6. To know about the moral and ethics of duty 7. To gain knowledge on the differences of work ethics and professional ethics
	BCA 3103 .(dot)NET Technology	<ol style="list-style-type: none"> 1. To learn about the overview of .net 2. To know about the .net web services and the dot NET Framework 3. To acquire knowledge on the common language runtime 4. To know about the web services of .net 5. To familiarize with different kind of dot net languages and their platforms 6. To know about the Microsoft dot NET 7. To know about XML

	Paper Code and Name	Outcome
5th	BCA 3104 Compiler Design	<ol style="list-style-type: none"> 1. Knowing about the structure of a compiler 2. Knowing about the differences of code generation and code optimization 3. To know about the programming language constructs such as data elements 4. To know about the concept of parameter passing 5. To familiarize with the concept of lexical analyzer 6. To know the design of lexical analyzer 7. To be able to know the basic parsing techniques 8. To know about the differences of top down parsing and bottom up parsing 9. To acquire knowledge on code generation
	BCA 3195 Seminar (Individual)	<ol style="list-style-type: none"> 1. Students learn how to present seminar step by step. 2. Every seminar topic is noted and guided by the department. 3. Students learn to present their seminar.
	BCA 3196 JAVA Lab	<ol style="list-style-type: none"> 1. Learning how to prepare assignments on constructors destructors in Java practical classes 2. Practical example of Java using inheritance and method overriding 3. Java programs showing the use of arrays and pointers 4. Java assignments on developing interfaces 5. Learning how to access Java packages in Java practical classes 6. Learning how to use swing in Java programs 7. Learning to handle errors and exceptions in codes 8. Learning how to use Java applets
	BCA 3197 (.dot) NET Lab	<p>Learning lab work on</p> <ol style="list-style-type: none"> 1. Web services 2. XML and UDDI features 3. Learning practical.net codes on meta data 4. Learning about garbage collection 5. To know about the common language runtime in .net programs 6. Do you know how to compile dot net programs and run successfully for proper output

Semester	Paper Code and Name	<u>Outcome</u>
6TH	BCA 3201 OOAD using UML	<ol style="list-style-type: none"> 1. To know about the importance of modeling and to know about the principles of modeling 2. To acquire knowledge on object oriented modeling 3. To know about the conceptual model of the UML, the architectural development lifecycle of the UML 4. To know about the terms concepts I am modelling techniques for class and object 5. Do you know about the basic behavioral modeling 6. To know about the events and signals 7. About the architectural modeling 8. To know about the unified library applications
	BCA 3202 PHP/MY SQL.	<p>Outcome of PHP/MY SQL are:</p> <ol style="list-style-type: none"> 1. To know about the basics of Web Programming 2. Knowing about the installation of PHP/MySQL and web server 3. Knowing about PHP programming 4. Writing PHP Programs 5. Loops, Control Structure and Arrays 6. PHP functions String functions , Array functions , Mathematical function , Graphics functions, File system function, Date and time function , Miscellaneous Functions , 7. Error handling 8. Object Oriented Features of PHP 9. File and Directory handling 10. MySQL database Configuration of MySQL server , Starting MySQL server , MySQL tables ,Displaying MySQL data , Adding and removing user access. 11. Web Servers IIS web Server ,Apache web server
	BCA 3203 Computer Graphics and Multimedia	<ol style="list-style-type: none"> 1. To know about the development of computer graphics and multimedia 2. To know about points lines and cards 3. To know different line drawing algorithms 4. To you know how to generate midpoint circle drawing algorithm 5. To know about the three-dimensional concepts 6. To know about circle and ellipse generation 7. To you know about 3D viewing 8. To know about multimedia systems
	BCA 3294 Computer Graphics and Multimedia Laboratory	<ol style="list-style-type: none"> 1. Knowing Point plotting, line & regular figure algorithms 2. Drawing Raster scan line & circle drawing algorithms 3. Clipping & Windowing algorithms for points, lines & polygons 4. 2-D / 3-D transformations 5. Simple fractals representation , Demonstrate the properties of the Bezier curves. 6. Filling algorithms , Clip line segments against windows 7. Web document creation using Dreamweaver. 8. Creating Animation using Flash.
	Project (Industrial) BCA 3295	<ol style="list-style-type: none"> 1. Project is based on latest softwares and is guided by faculty members individually/group-wise. 2. Students are given different project topics on technology and are trained to take out the best from them. 3. A proper presentation and question & answer series follow every project class.
	Grand VIVA BCA 3296	A final viva is conducted to brush up the whole course in front of an External Examiner.

