SUPPORTING DOCUMENTS FOR 2.6.1

Programme and Course Outcomes for all Programmes

Program Outcomes, Program Specific outcomes, Course Outcomes

DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

Program Outcome

- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to design and conduct experiments, as well as to analyze and interpret data.
- An ability to design a system, component, or process to meet desired need within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacture ability, and sustainability.
- An ability to identify, formulates, and solve engineering problems. • An understanding of professional and ethical responsibility.
- An ability to communicate effectively.
- The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- A recognition of the need for, and an ability to engage in life-long learning.
- A knowledge of contemporary issues
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
- A knowledge and understanding of the management and finance concepts to estimate and manage projects in multidisciplinary environments.

Program Specific Outcomes

- Apply standard Software Engineering practices and strategies in real-time software project development using open-source programming environment.
- Design and develop computer programs in the areas of algorithms, networking, web design and cloud computing.
- Model computational problems by applying mathematical concepts and design solutions using suitable data structures and algorithmic techniques.

Course Outcomes of Computer Science and Engineering

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	BTPH104-18 Semiconductor Physics	CO1: Understand and explain the fundamental principles and properties of electronic materials and semiconductors CO2: Understand and describe the interaction of light with semiconductors in terms of fermi golden rule. CO3: Understand and describe the impact of solid-state device capabilities and limitations on electronic circuit performance. CO4: Understand the design, fabrication, and characterization techniques of Engineered semiconductor materials. CO5: Develop the basic tools with which they can study and test the newly developed devices and other semiconductor applications.
2.	BTPH114-18 Semiconductor Physics Lab	CO1: Able to verify some of the theoretical concepts learnt in the theory courses. CO2: Trained in carrying out precise measurements and handling sensitive equipment. CO3: Introduced to the methods used for estimating and dealing with experimental uncertainties and systematic "errors." CO4: Learn to draw conclusions from data and develop skills in experimental design. CO5: Write a technical report which communicates scientific information in a clear and concise manner.
3.	BTAM104-18 Mathematics Paper-I (Calculus & Linear Algebra)	CO1: To apply differential and integral calculus to notions of curvature and to improper integrals. Apart from various applications, they will have a basic understanding of Beta and Gamma functions. The essential tools of matrices and linear algebra including linear transformations, eigenvalues, diagonalization and orthogonalization.
4.	BTAM204-18 Mathematics Paper-II (Probability & Statistics)	CO1: The ideas of probability and random variables and various discrete and continuous probability distributions and their properties. The basic ideas of statistics including measures of central tendency, correlation and regression and the statistical methods of studying data samples.
5.	BTCH101-18 Chemistry-I (Theory)	CO1: Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces. CO2: Rationalise bulk properties and processes using

		thermodynamic considerations CO3: Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques. CO4: Rationalise periodic properties such as ionization potential, electronegativity, oxidation states and electronegativity. CO5: List major chemical reactions that are used in the synthesis of molecules.
6.	BTCH102-18 Chemistry-I (Lab.)	CO1: Estimate rate constants of reactions from concentration of reactants/products as a function of time. CO2: Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc. CO3: Synthesize a small drug molecule and analyse a salt sample.
7.	BTPS101-18 Programming for Problem Solving (Theory)	CO1: To formulate simple algorithms for arithmetic and logical problems. CO2: To translate the algorithms to programs (in C language). CO3: To test and execute the programs and correct syntax and logical errors. CO4: To implement conditional branching, iteration and recursion. CO5: To decompose a problem into functions and synthesize a complete program using divide and conquer approach. CO6: To use arrays, pointers and structures to formulate algorithms and programs. CO7: To apply programming to solve matrix addition and multiplication problems and searching and sorting problems. CO8: To apply programming to solve simple numerical method problems, namely rot finding of function, differentiation of function and simple integration.
8.	BTPS102-18 Programming for Problem Solving (Lab)	CO1: To formulate the algorithms for simple problems. CO2: To translate given algorithms to a working and correct program. CO3: To be able to correct syntax errors as reported by the compilers. CO4: To be able to identify and correct logical errors encountered at run time. CO5: To be able to write iterative as well as recursive programs. CO6: To be able to represent data in arrays, strings and structures and manipulate them through a program.

		CO7: To be able to declare pointers of different types and use them in defining self referential structures. CO8: To be able to create, read and write to and from simple text files.
9.	BTMP101-18 Workshop/Manufacturing Practices (Theory & Lab.)	CO1: Upon completion of this course, the students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials. CO2: Upon completion of this laboratory course, students will be able to fabricate components with their own hands. CO3: They will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes. CO4: By assembling different components, they will be able to produce small devices of their interest.
10.	BTHU-101-18 English	CO1: The objective of the course is to help the students become the independent users of English language. CO2: Students will acquire basic proficiency in reading & listening, comprehension, writing and speaking skills. CO3: Students will be able to understand spoken and written English language, particularly the language of their chosen technical field. CO4: They will be able to converse fluently. CO5: They will be able to produce on their own clear and coherent texts.
11.	BTHU-102-18 English Laboratory	CO1: The objective of the course is to help the students become the independent users of English language. CO2: Students will acquire basic proficiency in listening and speaking skills. CO3: Students will be able to understand spoken English language, particularly the language of their chosen technical field. CO4: They will be able to converse fluently. CO5: They will be able to produce on their own clear and coherent texts.
12.	BTME101-18 Engineering Graphics & Design (Theory & Lab.)	CO1: Introduction to engineering design and its place in society. CO2: Exposure to the visual aspects of engineering design. CO3: Exposure to engineering graphics standards. CO4: Exposure to solid modeling. CO5: Exposure to computer-aided geometric design. CO6: Exposure to creating working drawings. CO7: Exposure to engineering communication.

13.	BTCS-301-18 Data Structure & Algorithms	CO1: For a given algorithm student will able to analyze the algorithms to determine the time and computation complexity and justify the correctness. CO2: Student will be able to handle operation like searching, insertion, deletion, traversing on various Data Structures and determine time and computational complexity. CO3: Student will able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity. CO4: Students will be able to choose appropriate Data Structure as applied to specific problem definition. CO5: Demonstrate the reusability of Data Structures for implementing complex iterative problems.
14.	BTCS-302-18 Object Oriented Programming	CO1: Identify classes, objects, members of a class and the relationships among them needed to solve a specific problem; CO2: Demonstrate the concept of constructors and destructors. And create new definitions for some of the operators; CO3: Create function templates, overload function templates; CO4: Understand and demonstrate the concept of data encapsulation, inheritance, polymorphism with virtual functions; & CO5: Demonstrate the concept of file operations, streams in C++ and various I/O manipulators.
15.	BTCS-303-18 Data Structure & Algorithms Lab	CO1: Improve practical skills in designing and implementing basic linear data structure algorithms; CO2: Improve practical skills in designing and implementing Non-linear data structure algorithms; CO3: Use Linear and Non-Linear data structures to solve relevant problems; CO4: Choose appropriate Data Structure as applied to specific problem definition; & CO5: Implement Various searching algorithms and become familiar with their design methods.
16.	BTCS-304-18 Object Oriented Programming Lab	CO1: Develop classes incorporating object-oriented techniques; CO2: Design and implement object-oriented concepts of inheritance and polymorphism; CO3: Illustrate and implement STL class of containers and need for exceptions to handle errors for object

		oriented programs; & CO4: Design and implement any real world based problem involving GUI interface using object-oriented concepts.
17.	BTCS-304-18 Mathematics Paper-III (Calculus and Ordinary Differential Equations)	CO1: Understand the functions of several variables that are essential in most branches of engineering; CO2: Apply multiple integrals to deal with areas and volumes of various structures which are quite significant in real world; CO3: Formulate and solve engineering problems related to convergence, infinite series, power series and Taylor series; CO4: Create, select and utilize the learnt techniques of first degree ordinary differential equations to model real world problems &; CO5: Be acquainted with the knowledge required to solve higher order ordinary differential equations.
18.	HSMC-101-18 Development of Societies	CO1: Recognize and appreciate nuance and complexity of meaning through critical reflections on texts, visual images, and artifacts. CO2: Identify and evaluate human values and ethical positions in their contemporary and historical contexts. CO3: Express themselves in a clear, organized, and well-reasoned manner. CO4: Articulate underlying premises in their own and others' beliefs. CO5: Demonstrate a familiarity with and appreciation of the importance of diverse cultural, ethnic, and linguistic perspectives. CO6: Evaluate the significance of humanities and interdisciplinary in our world
19.	BTES-301-18 Digital Electronics	CO1: Demonstrate the operation of simple digital gates, identify the symbols, develop the truth table for those gates; combine simple gates into more complex circuits; change binary, hexadecimal, octal numbers to their decimal equivalent and vice versa. CO2: Demonstrate the operation of a flip-flop. Design counters and clear the concept of shift registers. CO3: Study different types of memories and their applications. Convert digital signal into analog and vice versa.
20.	BTES-302-18 Digital Electronics Lab	CO1: Realize combinational circuits using logic gates. CO2: Realize sequential circuits using logic gates. CO3: Realize various types of Flip-flops and counters

21.	BTES-401-18 Computer Organization & Architecture	CO1: Understand functional block diagram of microprocessor; CO2: Apply instruction set for Writing assembly language programs; CO3: Design a memory module and analyze its operation by interfacing with the CPU; CO4: Classify hardwired and micro programmed control units; & CO5: Understand the concept of pipelining and its performance metrics.
22.	BTCS-402-18 Operating Systems	CO1: Explain basic operating system concepts such as overall architecture, system calls, user mode and kernel mode; CO2: Distinguish concepts related to processes, threads, process scheduling, race conditions and critical sections; CO3: Analyze and apply CPU scheduling algorithms, deadlock detection and prevention algorithms; CO4: Examine and categorize various memory management techniques like caching, paging, segmentation, virtual memory, and thrashing; CO5: Design and implement file management system; & CO6: Appraise high-level operating systems concepts such as file systems, disk-scheduling algorithms and various file systems.
23.	BTCS-403-18 Design and Analysis of Algorithms	CO1: For a given algorithms analyze worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms; CO2: Explain when an algorithmic design situation calls for which design paradigm (greedy/ divide and conquer/backtrack etc.); CO3: Explain model for a given engineering problem, using tree or graph, and write the corresponding algorithm to solve the problems; CO4: Demonstrate the ways to analyze approximation/randomized algorithms (expected running time, probability of error); & CO5: Examine the necessity for NP class based problems and explain the use of heuristic techniques.
24.	BTES 402-18 Computer Organization & Architecture Lab	CO1: Assemble personal computer; CO2: Implement the various assembly language programs for basic arithmetic and logical operations; & CO3: Demonstrate the functioning of microprocessor/microcontroller based systems with I/O interface.

25.	BTCS 404-18 Operating Systems Lab	CO1: Understand and implement basic services and functionalities of the operating system; CO2: Analyze and simulate CPU Scheduling Algorithms like FCFS, Round Robin, SJF, and Priority; CO3: Implement commands for files and directories; CO4: Understand and implement the concepts of shell programming; CO5: Simulate file allocation and organization techniques; CO6: Understand the concepts of deadlock in operating systems and implement them in multiprogramming system.
26.	BTCS 405-18 Design and Analysis of Algorithms Lab	CO1: Improve practical skills in designing and implementing complex problems with different techniques; CO2. Understand comparative performance of strategies and hence choose appropriate, to apply to specific problem definition; CO3. Implement Various tree and graph based algorithms and become familiar with their design methods; CO4. Design and Implement heuristics for real world problems
27.	HSMC 122-18 Universal Human Values 2: Understanding Harmony	CO1: Students are expected to become more aware of themselves, and their surroundings (family, society, nature); CO2: They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind. CO3: They would have better critical ability. CO4: They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society). CO5: They would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.
28.	EVS 101-18 Environmental Studies	CO1. Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions. CO2. Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving. CO3. Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems. CO4. Reflect critically about their roles and identities as

		citizens, consumers and environmental actors in a complex, interconnected world.
29.	BTCS 401-18 Discrete Mathematics	CO1. To be able to express logical sentence in terms of predicates, quantifiers, and logical connectives CO2. To derive the solution for a given problem using deductive logic and prove the solution based on logical inference CO3. For a given a mathematical problem, classify its algebraic structure CO4. To evaluate Boolean functions and simplify expressions using the properties of Boolean algebra CO5. To develop the given problem as graph networks and solve with techniques of graph theory.
30.	BTES 501-18 Enterprise Resource Planning	CO1: To know the basics of ERP CO2: To understand the key implementation issues of ERP CO3: To know the business modules of ERP CO4: To be aware of some popular products in the area of ERP
31.	BTCS 501-18 Database Management Systems	CO1: write relational algebra expressions for a query and optimize the Developed expressions CO2: design the databases using ER method and normalization. CO3: construct the SQL queries for Open source and Commercial DBMS-MYSQL, ORACLE, and DB2. CO4: determine the transaction atomicity, consistency, isolation, and durability. CO5: Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling.
32.	BTCS 502-18 Formal Language & Automata Theory	CO1: Write a formal notation for strings, languages and machines. CO2: Design finite automata to accept a set of strings of a language. CO3: Design context free grammars to generate strings of context free language. CO4: Determine equivalence of languages accepted by Push Down Automata and languages generated by context free grammars CO5: Distinguish between computability and non-computability and Decidability and undecidability.
33.	BTCS 503-18 Software Engineering	CO1: Students should be able to identify the need for engineering approach to software development and various processes of requirements analysis for software

		engineering problems. CO2: Analyze various software engineering models and apply methods for design and development of software projects. CO3: Work with various techniques, metrics and strategies for Testing software projects. CO4: Identify and apply the principles, processes and main knowledge areas for Software Project Management CO5: Proficiently apply standards, CASE tools and techniques for engineering software projects
34.	BTCS 504-18 Computer Networks	CO1: Explain the functions of the different layer of the OSI Protocol; CO2: Describe the function of each block of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs); CO3: Develop the network programming for a given problem related TCP/IP protocol; CO4: Configure DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.
35.	BTCS 505-18 Database management System lab	CO1: This practical will enable students to retrieve data from relational databases using SQL. CO2: students will be able to implement generation of tables using data types CO3: Students will be able to design and execute the various data manipulation queries. CO4: Students will also learn to execute triggers, cursors, stored procedures etc.
36.	BTCS 506-18 Software Engineering Lab	CO1. Build a fully functional, interactive, layered, distributed, database-backed software system from the ground-up as part of a small, agile, development team in a laboratory setting CO2. Become acquainted with historical and modern software methodologies CO3. Understand the phases of software projects and practice the activities of each phase CO4. Take part in project management CO5. Become adept at such skills as distributed version control, unit testing, integration testing, build management, and deployment
37.	BTCS 507-18 Computer Networks Lab	CO1: Know about the various networking devices, tools and also understand the implementation of network topologies; CO2: Create various networking cables and know how to

		test these cables; CO3: Create and configure networks in packet trace retool using various network devices and topologies; CO4: Understand IP addressing and configure networks using the subnet in; CO5: Configure routers using various router configuration commands.
38.	BTCS 520-18 Web Technologies	CO1. Understand and apply the knowledge of web technology stack to deploy various web services. CO2. Analyze and evaluate web technology components for formulating web related problems. CO3. Design and develop interactive client server internet application that accommodates user specific requirements and constraint analysis. CO4. Program latest web technologies and tools by creating dynamic pages with an understanding of functions and objects. CO5. Apply advance concepts of web interface and database to build web projects in multidisciplinary environments. CO6. Demonstrate the use of advance technologies in dynamic websites to provide performance efficiency and reliability for customer satisfaction.
39.	BTCS 522-18 Web Technologies Lab	CO1. Students are able to develop a dynamic webpage by the use of java script and Students will be able to connect a java program to a DBMS and perform insert CO2. Students will be able to write a well formed / valid XML document. CO3. DHTML. Students will be able to write a server side java application called Servlet to catch CO4. Update and delete operations on DBMS table. Students will be able to write a server side java application called JSP to catch form CO5. Form data sent from client, process it and store it on database.
40.	Constitution of India/ Essence of Indian Traditional Knowledge	CO1. Able to understand historical background of the constitutional making and its importance for building a democratic India, the structure of Indian government, the structure of state government, the local Administration CO2. Able to apply the knowledge on directive principle of state policy, the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy. CO3. Able to analyze the History, features of Indian constitution, the role Governor and Chief Minister, role of

		state election commission, the decentralization of power between central, state and local self-government. Analysis CO4. Able to evaluate Preamble, Fundamental Rights and Duties, Zilla Panchayat, block level organization, various commissions of viz SC/ST/OBC and women.
41.	BTCS 601-18 Compiler Design	CO1: Build concepts on lexical analysis. CO2: Understand strategies of syntax analysis. CO3: Learn techniques of Intermediate code generation. CO4: Understand code design issues and design code generator. CO5: Design and develop optimized codes.
42.	BTCS 604-18 Compiler Design Lab	CO1. To design & implement a front end of the compiler. CO2. To develop program for implementing symbol table. CO3. To develop program for solving parser problems. CO4. To create program for intermediate code generation. CO5. To learn the new code optimization techniques and apply it to improve the performance of a program in terms of speed & space. CO6. To learn & use the new tools and technologies used for designing a compiler
43.	BTCS 602-18 Artificial Intelligence	CO1: Build intelligent agents for search and games CO2: Solve AI problems by learning various algorithms and strategies CO3: Understand probability as a tool to handle uncertainty CO4: Learning optimization and inference algorithms for model learning CO5: Design and develop programs for an reinforcement agent to learn and act in a structured environment
44.	BTCS 605-18 Artificial Intelligence Lab	CO1. Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations. CO2. Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning. CO3. Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models. CO4. Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool. CO5. Demonstrate proficiency in applying scientific method to models of machine learning. CO6. Demonstrate an ability to share in discussions of AI,

		its current scope and limitations, and societal implications.
45.	BTCS 612-18 Cloud Computing	CO1: Understand the core concepts of the cloud computing paradigm CO2: Understanding importance of virtualization along with their technologies CO3: Analyze various cloud computing service and deployment models and apply them to solve problems on the cloud. CO4: Implementation of various security strategies for different cloud platform
46.	BTCS 612-18 Cloud Computing Lab	CO1 Use the grid and cloud tool kits. CO2 Install and implement applications on the VMware. CO3 Design and Implement applications on the Cloud
47.	BTCS 618-18 Machine Learning	CO1: Analyze methods and theories in the field of machine learning CO2: Analyze and extract features of complex datasets CO3: Deploy techniques to comment for the Regression CO4: Comprehend and apply different classification and clustering techniques CO5: Understand the concept of Neural Networks and Genetic Algorithm
48.	BTCS 619-18 Machine Learning Lab	CO1. Recognize the characteristics of machine learning that make it useful to real-world problems. CO2. Characterize machine learning algorithms as supervised, semi-supervised, and unsupervised. CO3. Effectively use machine learning toolboxes. CO4. Be able to use support vector machines.
49.	BTEC 402-18 Microprocessors and Microcontrollers	CO1. Understand architecture &functionalities of different building block of 8085 microprocessor. CO2. Understand working of different building blocks of 8051 microcontroller. CO3. Comprehend and apply programming aspects of 8051 microcontroller. CO4. Interface & interact with different peripherals and devices.
50.	BTCS 603-18 PROJECT-1	CO1. Demonstrate a sound technical knowledge of their selected project topic. CO2. Undertake problem identification, formulation and solution. CO3. Design engineering solutions to complex problems utilising a systems approach. CO4. Conduct an engineering project.

		CO5. Communicate with engineers and the community at large in written an oral forms. CO6. Demonstrate the knowledge, skills and attitudes of a professional engineer.
51.	BTCS 701 Artificial Intelligence	CO1: Build intelligent agents for search and games CO2: Solve AI problems by learning various algorithms and strategies CO3: Understand probability as a tool to handle uncertainty CO4: Learning optimization and inference algorithms for model learning CO5: Design and develop programs for an reinforcement agent to learn and act in a structured environment
52.	BTCS 702 Theory of Computation	CO1: Write a formal notation for strings, languages and machines. CO2: Design finite automata to accept a set of strings of a language. CO3: Design context free grammars to generate strings of context free language. CO4: Determine equivalence of languages accepted by Push Down Automata and languages generated by context free grammars CO5: Distinguish between computability and non-computability and Decidability and undecidability.
53.	BTCS 703 PROJECT	CO1. Demonstrate a sound technical knowledge of their selected project topic. CO2. Undertake problem identification, formulation and solution. CO3. Design engineering solutions to complex problems utilising a systems approach. CO4. Conduct an engineering project. CO5. Communicate with engineers and the community at large in written an oral forms. CO6. Demonstrate the knowledge, skills and attitudes of a professional engineer.
54.	BTCS 704 Artificial Intelligence Lab	CO1. Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations. CO2. Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning. CO3. Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural

		networks and other machine learning models. CO4. Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool. CO5. Demonstrate proficiency in applying scientific method to models of machine learning. CO6. Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications.
55.	BTCS 907 Software Project Management	CO1: Explain project management in terms of the software development process CO2: Estimate project cost and perform cost-benefit evaluation among projects CO3: Apply the concepts of project scheduling and risk management CO4: Explain Software configuration management and the concepts of contract management. CO5: Apply quality models in software projects for maintaining software quality and reliability
56.	BTCS 912 Cloud Computing	CO1: Understand the core concepts of the cloud computing paradigm CO2: Understanding importance of virtualization along with their technologies CO3: Analyze various cloud computing service and deployment models and apply them to solve problems on the cloud. CO4: Implementation of various security strategies for different cloud platform
57.	BTCS 801 SOFTWARE TRAINING	CO1. Gain practical experience of the corporate environment. CO2. Apply knowledge and skills learned in the classroom to solve real life problems. CO3. Understand career options in IT industry. CO4. Learn professional and corporate behavior and ethics. CO5. Enhance soft skills required for the industry. CO6. Identify areas for future learning and skill development. CO7. To learn project management skills. CO8. To study the industry profile, background, Vision, Mission, Quality policy, Product/service profile CO9. Detailed study of various departments and the product life cycle.
58.	BTCS 802 Industry Oriented Project Training	COUT1: Students should be able to identify, formulate and analyze complex engineering problems. COUT2: Students should be able to apply their knowledge and skills to IT environment.

		COUT3: Students should be able to use computing and IT tools to improve efficiency and accuracy. COUT4: Students should be able to use software which is used to manage the task and modules of software. COUT5: Students should be able to measure the quality, cost and effectiveness of the project and the processes.

DEPARTMENT OF MECHANICAL ENGINEERING

Program Outcome

- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to design and conduct experiments, as well as to analyze and interpret data.
- An ability to design a system, component, or process to meet desired need within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacture ability, and sustainability.
- An ability to identify, formulates, and solves engineering problems.
- An understanding of professional and ethical responsibility.
- An ability to communicate effectively.
- The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- Recognition of the need for, and an ability to engage in life-long learning.
- A knowledge of contemporary issues
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
- A knowledge and understanding of the management and finance concepts to estimate and manage projects in multidisciplinary environments.

Program Specific Outcomes

- Apply standard Software Engineering practices and strategies in real-time software project development using open-source programming environment.
- Design and develop computer programs in the areas of algorithms, networking, web design and cloud computing.
- Model computational problems by applying mathematical concepts and design solutions using suitable data structures and algorithmic techniques.

Course Outcomes of ME Department

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	BTPH101-18 Mechanics of Solids	CO1: Understand the vector mechanics for a classical system CO2: Identify various types of forces in nature, frames of references, and conservation laws. CO3: Know the simple harmonic, damped, and forced simple harmonic oscillator for a mechanical system. CO4: Analyze the planar rigid body dynamics for a mechanical system CO5: Apply the knowledge obtained in this course to the related problems
2.	BTPH111-18 Mechanics of Solids Lab	CO1: Able to understand the concepts learned in the mechanics of solids CO2: Learning the skills needed to verify some of the concepts of theory courses. CO3: Trained in carrying out precise measurements and handling sensitive equipment. CO4: Able to understand the principles of error analysis and develop skills in experimental design. CO5: Able to document a technical report which communicates scientific information in a clear and concise manner.
3.	BTAM101-18 Mathematics-I (Calculus & Linear Algebra)	CO1: The fallouts of Rolle's Theorem that is fundamental to application of analysis to Engineering problems. CO2: To apply differential and integral calculus to evaluate definite, improper integrals and its applications. CO3: The convergence of sequence and series and to apply different tests of convergence. CO4: To deal with functions of several variables that is essential in most branches of engineering. CO5: The essential tool of matrices and linear algebra in a comprehensive manner.
4.	BTAM203-18 MATHEMATICS II (Ordinary Differential Equations and Complex Variable)	CO1: The effective mathematical tools for the solutions of differential equations that model physical processes. CO2: The tools of differentiation and integration of functions of a complex variable that are used in various techniques dealing engineering problems.
5.	BTCH101-18 Chemistry-I (Theory)	CO1: Analyze microscopic chemistry in terms of atomic and molecular orbital's and intermolecular forces. CO2: Rationalize bulk properties and processes using thermodynamic considerations

		CO3: Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques. CO4: Rationalize periodic properties such as ionization potential, electro negativity, oxidation states and electro negativity. CO5: List major chemical reactions that are used in the synthesis of molecules.
6.	BTCH102-18 Chemistry-I (Lab.)	CO1: Estimate rate constants of reactions from concentration of reactants/products as a function of time. CO2: Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc. CO3: Synthesize a small drug molecule and analyze a salt sample.
7.	BTPS101-18 Programming for Problem Solving (Theory)	CO1: To formulate simple algorithms for arithmetic and logical problems. CO2: To translate the algorithms to programs (in C language). CO3: To test and execute the programs and correct syntax and logical errors. CO4: To implement conditional branching, iteration and recursion. CO5: To decompose a problem into functions and synthesize a complete program using divide and conquer approach. CO6: To use arrays, pointers and structures to formulate algorithms and programs. CO7: To apply programming to solve matrix addition and multiplication problems and searching and sorting problems. CO8: To apply programming to solve simple numerical method problems, namely rot finding of function, differentiation of function and simple integration.
8.	BTPS102-18 Programming for Problem Solving (Lab)	CO1: To formulate the algorithms for simple problems. CO2: To translate given algorithms to a working and correct program. CO3: To be able to correct syntax errors as reported by the compilers. CO4: To be able to identify and correct logical errors encountered at run time. CO5: To be able to write iterative as well as recursive programs. CO6: To be able to represent data in arrays, strings and structures and manipulate them through a program.

		CO7: To be able to declare pointers of different types and use them in defining self referential structures. CO8: To be able to create, read and write to and from simple text files.
9.	BTMP101-18 Workshop/Manufacturing Practices (Theory & Lab.)	CO1: Upon completion of this course, the students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials. CO2: Upon completion of this laboratory course, students will be able to fabricate components with their own hands. CO3: They will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes. CO4: By assembling different components, they will be able to produce small devices of their interest.
10.	BTHU-101-18 English	CO1: The objective of the course is to help the students become the independent users of English language. CO2: Students will acquire basic proficiency in reading & listening, comprehension, writing and speaking skills. CO3: Students will be able to understand spoken and written English language, particularly the language of their chosen technical field. CO4: They will be able to converse fluently.
11.	BTHU-102-18 English Laboratory	CO1: The objective of the course is to help the students become the independent users of English language. CO2: Students will acquire basic proficiency in listening and speaking skills. CO3: Students will be able to understand spoken English language, particularly the language of their chosen technical field. CO4: They will be able to converse fluently. CO5: They will be able to produce on their own clear and coherent texts.
12.	BTME101-18 Engineering Graphics & Design (Theory & Lab.)	CO1: Introduction to engineering design and its place in society. CO2: Exposure to the visual aspects of engineering design. CO3: Exposure to engineering graphics standards. CO4: Exposure to solid modeling. CO5: Exposure to computer-aided geometric design. CO6: Exposure to creating working drawings. CO7: Exposure to engineering communication.

13.	BTME-301 Strength of Materials	CO1: Graduates will be able to define stress, strain, bending moment, torsion, column and struts. CO2:Graduates will be able to describe graphical relations for ductile and brittle material. CO3:Graduates will be able to familiarize with the use of stress, strain, bending moment, torsion, and column and struts. CO4:Graduates have able to distinguish column and struts. CO4:Graduates have able to solve problem stress, strain, bending moment and shear force, torsion, slope and deflection, column and struts.
14.	BTME-308 Strength of Materials Lab.	CO1. Students will be able to understand the concepts of stress and strain. CO2. Students will be able to identify and solve the stress and strain related problems. CO3. Students will be able to compare graphically behavior of ductile material. CO4. Students will be able to analysis various critical points in stress strain graph. CO5. Students will be able to understand the concept of gradual and impact loading. CO6. Students will be able to solve problem by varying nature of loads and evaluate deflection in beams.
15.	BTME-302 Theory of Machines	CO1. Students will be able to define the basics of kinematic links, kinematic chains and other concepts of kinematics of machines. CO2. Students will be able to understand kinetics of machines, theory of belt drives and chain drives. CO3. Students will be able analyze the applications of brakes, dynamometers and friction devices. CO4. Students will be able analyze and compare belt, rope and chain drives. CO5. Students will be able synthesize and design machine elements. CO6. Students will be able to evaluate the knowledge gained from kinetics of machines.

16.	BTME-303 Machine Drawing	CO1. To recall the engineering drawing, drawing instruments and other drawing materials. CO2. To discuss the machine, working, detail & assembly drawing. CO3. To explain & application of various types machine components/joints/machine symbols. CO4. To examine & draw the various types of machine components i.e. Fasteners, couplings, joints, Valves and IC engine parts their SI standards.
17.	BTME-304 Applied Thermodynamics-1	CO1. Students will be able to define and understand various types of thermodynamics process or cycle. CO2. Students will be able to explain the working of IC engine, steam generator, nozzle, steam turbine, condenser and cooling tower. CO3. Students will be able to solve thermodynamics related problem related in IC engine, steam generator, steam turbine, steam power plant, condenser and cooling tower. CO4. Students will be able to distinguish between various types of IC engine, steam generator, steam turbine, condenser and cooling tower. CO5. Students will be able to do thermodynamics analysis of various types steam, combustion related problems. CO6. Students will be able to evaluate the performance internal combustion engine and various parts in steam power plant.
18.	BTME-309 Applied Thermodynamics Lab	CO1. Students will be able to understand the constructional and valve timing of 4 stroke diesel engine. CO2. Students will be able to understand construction mountings and accessories of various types of boilers. CO3. Students will be able to determine the brake power, indicated power, friction power and mechanical efficiency of a multi cylinder petrol engine and single cylinder diesel engine running at constant speed. CO4. Students will be able to understand construction and operation of various types of

		steam condensers and cooling towers.
19.	BTME-305 Manufacturing Processes-1	CO1. Graduates will be able to define manufacturing process. CO2. Graduates will be able to discuss metal casting and welding process. CO3. Graduates will be able to familiarize with use of various metal casting and welding process. CO4. Graduates will be able to distinguish various metal casting and welding process. CO5. Graduates will be able to select various metal casting and welding process.
20.	BTME-306 Engineering Materials & Metallurgy	CO1. Students will be able to name the different types of crystal structure and to define various imperfections in solids. CO2. Students will be able to explain iron carbon equilibrium diagram and describe various phase transformations. CO3. Students will be able to demonstrate the effects of alloying elements (Si, Mn, Ni, Cr, Mo, W, Al) on the structure. CO4. Students will be able to compare different type of phase diagram for binary system like eutectic, peritectic, eutectoid, type. CO5. Students will be able to design different alloying elements by using the different types of heat treatment process.
	BTME-307 Engineering Materials & Metallurgy Lab	CO1. Students will be able to define the various crystal structures. CO2. Students will be able to explain the basic concept of heat treatment. CO3. Students will be able to apply various methods for the preparation of specimens for microstructure examination. CO4. Students will be able to compare different heating temperature and heating time whiles the heat treatment process. CO5. Students will be able to create different mechanical properties by changing the quenching medium while heat treatment processes.

		CO6. Students will be able to judge the ferrite and pearlite constituents in the given specimen.
21.	BTME-401 Strength of Materials-2	CO1. Graduates will be able to define the concepts of strain energy, spring, various cylinders, and stresses in beam. CO2. Graduates will be able to describe various theory of failure. CO3. Graduates will be familiarizing the use of strain energy, theories of failure, cylinders, and rotational discs. CO4. Graduates will be able to distinguish various theories of failure, thin and thick cylinder. CO5. Graduates will be able to solve problems related to strain energy, theories of failure, cylinders, stresses in beams, rotational discs.
22.	BTME-402 Theory of Machines-2	CO1. Students will be able to define the basics of kinematic links, kinematic chains and other concepts of kinematics of machines. CO2. Students will be able to understand kinetics of machines, balancing of masses and design of gears & gear trains. CO3. Students will apply various concepts of gyroscopic effect, gears and force analysis. CO4. Students will analyze how to design machine components. CO5. Graduates will be able to synthesize the kinetics of machines. CO6. Students will able to evaluate the knowledge gained from kinetics of machines.
23.	BTME-408 Theory of Machines Lab	CO1. Students will be able to understand balancing of masses and design of gears and gear trains. CO2. Students will gain knowledge of kinematic synthesis and different applications of gyroscopic effect.

24.	BTME-403 Fluid Mechanics	CO1. Students will be able to define fundamentals of fluid mechanics; fluid static, fluid kinematics, fluid dynamic. CO2. Students will be able to explain various types of flows, working of various Pressure and Flow Measurement devices. CO3. Students will be able to solve problems related to fluid static, fluid kinematics, fluid dynamic and dimensional analysis. CO4. Students will be able to analysis pattern of Flow inside the pipe and over the plate.
25.	BTME-406 Fluid Mechanics Lab	CO1. Students will be able to recognize the various types of flows. CO2. Students will understand the concept of buoyancy, met centric height and able to find met centric height. CO3. Students will be able to measure the discharge by Venturimeter, orifice meter and notches and find the coefficients of discharges for them. CO4. Students will be able to measure the losses/ friction coefficients in pipe lines at various conditions like sudden expansion, sudden contraction, bend etc.
26.	BTME-404 Applied Thermodynamics-2	CO1. Students will be able to define various types of compressor, gas turbine cycle and jet propulsion system. CO2. Students will be able to explain the working of various types of compressors, gas turbine and jet propulsions. CO3. Students will understand the uses of compressors, gas turbine and jet propulsion. CO4. Students will be able to thermodynamic analysis of various types of compressor, gas turbines and jet propulsions. CO5. Students will be able to distinguish between various types of compressor, gas turbines and jet propulsions. CO6. Students will be able to evaluate the performance various types of compressor, gas turbines and jet propulsions.

27.	BTME-405 Manufacturing Processes-2	CO1. To be able define the concept of manufacturing. CO2. To be able to describe the principle operation and capability of various metal cutting, metal forming and machine tools. CO3. To be able to explain the importance of process variables controlling these processes. CO4. To be able to judge the different types of the metal machining and forming processes needed for the manufacturing of various geometrical shapes of products.
28.	BTME-407 Manufacturing Processes Lab	CO1. Students will be able to understand the importance of the manufacturing processes. CO2. Students will be able to select a suitable metal casting and metal joining processes to fabricate an engineering product.
29.	BTAM-500 Mathematics-3	CO1. Students will be able to define numerical techniques. CO2. Students will able to explain the graphical representation of sine and cosine functions. CO3. Students will be able to solve differential equations and real life problems with the help of numerical methods. CO4. Students will be able to compare functions of real variables and complex variables. CO5. Students will be able to develop an idea about the convergence of solution of heat equation, wave equation in one dimension and two dimensions. CO6. Students will be able to judge the complexity of differential equation whether it is solve by ordinary method or with the help of Laplace transforms.
30.	BTME-501 Design of Machine Elements-1	CO1. Students will be able to understand the meaning of machine design and various types of machine design processes. CO2. Students will be able to explain the design of various types of fasteners like riveted joint, bolted joint and welded joint under various loading conditions. CO3. Students will be able to apply the design of rigid and flexible coupling for torque transmission.

		CO4. Students will be able to distinguish between various types of cotter and knuckle joints. CO5. Students will be able to develop the skill to design different types of transmission shafts, axles, links, levers and pipe joints. CO6. Students will be able to judge the effectiveness of various types of design processes.
31.	BTME-502 Computer aided Design And Manufacturing	CO1. To be able to define various CAD/CAM devices. CO2. To be able to describe engineering components using various modeling techniques. CO3. To be able to demonstrate and develop CAM programs. CO4. To analyze the basics of computer aided process planning. CO5. To be able to judge various manufacturing techniques using computer.
32.	BTME-506 Computer Aided Design and Manufacturing Lab	CO1. Students will be able to do 2D modeling. CO2. Students will be able to do 3D modeling. CO3. Students will be able to do assembling and drafting with proper mating conditions and interference checking.
33.	BTME-503 Mechanical Measurement and Metrology	CO1. Students are able to define the basic principles of measurements and various types of standards of measurement used in industry. CO2. Students will be able to illustrate static and dynamic characteristics of measurement systems. CO3. Students will be able to apply calibration to various measuring systems in order to overcome errors. CO4. Students will be able to categorize the linear, angular measurement devices. CO5. Students will be able to gain knowledge of various types of sensors and transducers and their role in instrumentation. CO6. Students will able to recommend the various pressure, flow, temperature measurement devices required in manufacturing or process industry.

34.	BTME-507 Mechanical Measurement and Metrology Lab.	CO1. Students will be able to understand the concepts and fundamental of measurement. CO2. Students will be able to understand the concept the usage of measuring instrument and calibration.
35.	BTME-504 Industrial Automation and Robotics	CO1. Students will able to explain the basic need, scope and social impact of Automation and Robotics in the engineering world. CO2. Students will be able to describe the construction detail and working of various parts used in automation system. CO3. Students will be able to design and construct the different automation system to bring innovation in the various organization of the world. CO4. Students will efficiently apply the automation system in manufacturing industries at their respective demand in working process.
36.	BTME-508 Industrial Automation and Robotics Lab	CO1. Students will be able to define various types of hydraulic and pneumatic circuits. CO2. Students will be able to describe the working of various types of hydraulic and pneumatic valves. CO3. Students will be able to construct various types of circuits by using different types of direction control valves. CO4. Students will be able to compare different types of robotic end effectors.
37.	BTME-505 Automobile Engineering	CO1. Students will be able to use their depth knowledge and skills of Automobile Engineering to pursue successful professional career in Automobile Industry. CO2. Students will be able to explain the working of shock absorbers CO3. Students will be able to identify and solve automobile engineering problems CO4. Students will be able to compare different types of wheels and tyres. CO5. Students will be able to judge formation of automobile pollution and various control techniques.

38.	BTME-509 Automobile Engineering Lab	CO1. Students will have the ability to understand the troubleshooting in cooling system of an automotive vehicle. CO2. Students will be able to replace the piston rings. CO3. Students will be able to measure various steering geometry.
39.	BTME-601 Design of Machine Elements-II	CO1. Students will be able to define and design various types of belt, rope, chain and gear drives. CO2. Students will be able to describe the various principles and modes of lubrication. CO3. Students will gain the knowledge to design various types of slider and roller bearings. CO4. Students will be able to compute the energy stored in a flywheel and will able to design flywheel. CO5. Students will be able to analyze and design various types of springs
40.	DE/ME-2.5 Total Quality Management	CO1. Students will be able to define quality, total quality management and Total Quality Management Models. CO2. Students will be able to understand the objectives of total quality management, total quality, and total quality control. CO3. Students will be able to analyze the applications of benchmarking, planning process to control the quality of product. CO4. Students will be able to do analysis of standards required for quality management and quality control. CO5. Students will be able to synthesis just in time system and total employee involvement.
41.	DE/PE 2.0 Design Of Non Traditional Machining	CO1. Students will be able to define the non-conventional machining processes. CO2. Students will be able to explain the characteristics of nontraditional machining. CO3. Students will be able to apply various nontraditional machining processes. CO4. Students will be able to compare various nontraditional machining processes. CO5. Students will be able to develop

		mathematical model relating MRR with nontraditional machining processes. CO6. Students will be able to evaluate the best nontraditional machining process from various nontraditional process related to particular job.
42.	BTME-602 Heat Transfer	CO1. To be able to understand concepts and fundamental laws of different mode heat transfer. CO2. To identify and solve the conduction convention & radiation related problems. CO3. To analyze and interpret data with the empirical correlations for free and forced convention & radiation related problems.
43.	BTME-605 Heat Transfer Lab.	CO1. Students will understand and apply the fundamental law (Fourier law, Newton law of cooling, Stefan Boltzmann law) of heat transfer to solve and simplify the real situation in engineering application. CO2. Students will be able to identify and analyze the result of experiments and recognize the trends of output of the experiments. CO3. Students will able to recognize the various types heat exchange devices and their applications in industry.
44.	BTME-603 Fluid Machinery	CO1. Graduates will be able to define concept of fluid machinery. CO2. Graduates will be able to describe working construction and operation of various turbines. CO3. Graduates will be familiarizing with the uses of various fluid machineries. CO4. Graduates will be able to distinguish various turbine and pumps and hydraulic machinery. CO5. Graduates will be able to solve problems related to work done and gain efficiency. CO6. Graduates will be able to design turbine by varying parameters.
45.	BTME-606 Fluid Machinery Lab.	CO1. Students will be able to analyze the working of the hydraulic ram. CO2. Students will be able to analyze the working of the Francis turbine. CO3. Students will be able to analyze the working of the reciprocating pump. CO4. Students will be able to working of the

		pelton turbine. CO5. Students will be able to analyze the working of centrifugal fan/ blower. CO6. Students will be able to understand the working of Hydroelectric Power Station.
46.	BTME-604 Statistical and Numerical Methods in Engineering	CO1. Students will be aware of the mathematical background for the different numerical methods introduced in the course. CO2. Students will be able to explain the different numerical methods to solve the algebraic equations and to solve system of linear and non linear equations. CO3. Students will be able to use different numerical methods for interpolation, differentiation, integration, solving set of ordinary and partial differential equations. CO4. Students will be able to analyze data with the help of probability distributions. CO5. Students will be able to develop rational thinking, by which they can able to create programs in computer languages. CO6. Students will be able to judge the difference between analytic methods and numerical methods.
47.	BTME-801 Industrial Engineering and Management	CO1. The students will be able to define the concept of management and principles of management. CO2. The students will be able to explain the concept of organization and various types of organization. CO3. Graduates may understand and solve the problems of management planning & decision making. CO4. The students will be able to analyze the problem of plant layout and location. CO5. The students will be able to designing organizational structure. CO6. The students will be able to judge the productivity and value engineering.
48.	BTME-802 Refrigeration and Air Conditioning	CO1. Students will able to understand the basic concept and fundamental of refrigeration and air conditioning system. CO2. Students will able to identify & solve the cooling load of refrigeration and air conditioning system.

		CO3. Students will able to analyze the rate and state of air supply to air conditioning space by using the psychometric charts.
49.	BTME-804 Refrigeration & Air Conditioning lab	CO1. Students will be able to explain various elements of a vapour compression refrigeration system. CO2. Students will be able to explain the working of domestic refrigerator and electrolux refrigerator. CO3. Students will be able to calculate cooling load for a large building. CO4. Students will be able to explain the working of window type room air conditioner. CO5. Students will be able to explain the working of water cooler.
50.	BTME-803 Mechanical Vibrations	CO1. Students will be able to define the basics of vibration. CO2. To be able to understand the various types of vibration. CO3. To be able to solve the problems related to single, double and multi degree of freedom systems. CO4. Students will be able to compare the various types of vibration absorbers. CO5. Students will be able to explain the multi degree of freedom and continuous systems.
51.	BTME-805 Mechanical Vibrations lab	CO1. Students will be able to verify the relation of simple pendulum. CO2. Students will be able determine the radius of gyration 'k' of a given compound pendulum and given bar by using bi-flier suspension. CO3. Students will be able to solve natural frequency of torsional vibration of single rotor system. CO4. Students will be able to compare natural frequencies single rotor system and two rotor systems. CO5. Student will be able to explain the working of vibration absorber.

52.	IT 500 Industrial Training	CO1. Ability to acquire and apply fundamental principles of science and engineering. CO2. Capability to communicate effectively. CO3. Ability to identify, formulate and model problems and find engineering solution based on a systems approach. CO4. Ability to conduct research in the chosen fields of engineering. CO5. Understanding of the importance of sustainability and cost-effectiveness in design and developments of engineering solution. CO6. Ability to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurship skills.
53.	HU - 251 Human Resource Management	CO1. Students will be able to define the functions of human resource management within organizations. CO2. Students will be able to understand the current issues, trends, practices, and processes in HRM. CO3. Students will be able to analyze the role human resources manager in an organization. CO4. Students will be able to do Job analysis & design. CO5. Students will be able to synthesis of Problem related to human resource challenges and Methods of Recruitment.
54.	BTME – 310 Workshop Training	CO1. Students are able to name the different marking tools, measuring instruments and various types of cutting tools used in manufacturing process. CO2. Students will be able to describe the job procedure involved in making a job in various shops. CO3. Students will be able to use the different marking tools, measuring instruments and various types of cutting tools used in manufacturing process. CO4. Students will be able to compare the various tools used in cutting/marking/measuring tools. CO5. Students will be able to create the

		various jobs in various shops. CO6. Students will able to recommend the shop for the preparation of job.
55.	BTME- IT Industrial Oriented And Project Training	CO1. To apply the fundamental principles of science and engineering to industrial uses/ applications. CO2. Use the effectively communication among the industrial persons/workers to make the healthy and positive relations. CO3. To examine and indentify all process/practices/problems in industrial applications and find engineering solution based on a system approach. CO4. In order to improve the research and development activity based on the engineering applications. CO5. To modify the design and development of product is based on engineering applications. CO6. To evaluate the performance/efficiency of product/apparatus and apply the engineering knowledge, management, leadership and technical skills.
56.	BTME-IT Software Training	CO1. To apply the fundamental principles of Computer graphic lab during the software training. CO2. Use the tool (Auto CAD/CAM) effectively in the industrial operation, drafting a new product and modify accordingly as per their requirements. CO3. In order to improve the research and development activity based on the CAD/CAM applications. CO4. To modify the design and develop a product as per current market conditions. CO5. To evaluate the performance of product by computational fluid dynamics, stress, fatigue analysis during the software training.

57.	BTME – 607 Minor Project	CO1. Students will be able to design various types of components involving the aspects like manufacturing, casting/forging etc. CO2. Students will be able to describe the various fabrication processes and techniques. CO3. Students will gain the knowledge to design core mechanical equipments/members/components/machine parts. CO4. Students will be able to compute the various aspects needed in the design of mechanical parts/components which involves manufacturing, fabrication etc. CO5. Students will be able to analyze and design various types of aspects used in the design process of their major project. CO6. Students will have the ability to explain any positive gain in the project made.
58.	BTME – 806 Major Project	CO1. Students will be able to design various types of components involving the aspects like manufacturing, casting/forging etc. CO2. Students will be able to describe the various fabrication processes and techniques. CO3. Students will gain the knowledge to design core mechanical equipments/members/components/machine parts. CO4. Students will be able to compute the various aspects needed in the design of mechanical parts/components which involves manufacturing, fabrication etc. CO5. Students will be able to analyze and design various types of aspects used in the design process of their major project. CO6. Students will have the ability to explain any positive gain in the project made.

DEPARTMENT OF INFORMATION TECHNOLOGY

Program Outcome

The Program Objectives developed for B.Tech for Information Technology are:

- Graduates will utilize their expertise and experience to solve Information Technology problems in industry.
- Graduates will be leading professionals, innovators and entrepreneurs in the development and deployment of software, information systems and information management tools.
- Graduates will carry out their assignment in industry with social awareness and responsibility.
- Graduates will interact with their peers in other disciplines in industry and society and contribute to the economic growth of the country.
- Graduates will have the academic background to be successful in graduate studies.
- Graduates will be able to pursue career paths in teaching or research.

Program Specific Outcomes

- Design, develop and test computer programs for world-wide network of computers to provide solutions to practical world problems.
- Use and apply current technical concepts and practices in the core Information Technologies of human computer interaction, database management, programming and networking.
- Efficiently integrate IT-based solutions into the user environment.

Course Outcomes of Information Technology

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	BTPH104-18 Semiconductor Physics	CO1: Understand and explain the fundamental principles and properties of electronic materials and semiconductors CO2: Understand and describe the interaction of light with semiconductors in terms of fermi golden rule. CO3: Understand and describe the impact of solid-state device capabilities and limitations on electronic circuit performance. CO4: Understand the design, fabrication, and characterization techniques of Engineered semiconductor materials. CO5: Develop the basic tools with which they can study and test the newly developed devices and other semiconductor applications.
2.	BTPH114-18 Semiconductor Physics Lab	CO1: Able to verify some of the theoretical concepts learnt in the theory courses. CO2: Trained in carrying out precise measurements and handling sensitive equipment. CO3: Introduced to the methods used for estimating and dealing with experimental uncertainties and systematic "errors." CO4: Learn to draw conclusions from data and develop skills in experimental design. CO5: Write a technical report which communicates scientific information in a clear and concise manner.
3.	BTAM104-18 Mathematics Paper-I (Calculus & Linear Algebra)	CO1: To apply differential and integral calculus to notions of curvature and to improper integrals. Apart from various applications, they will have a basic understanding of Beta and Gamma functions. The essential tools of matrices and linear algebra including linear transformations, eigenvalues, diagonalization and orthogonalization.
4.	BTAM204-18 Mathematics Paper-II (Probability & Statistics)	CO1: The ideas of probability and random variables and various discrete and continuous probability distributions and their properties. The basic ideas of statistics including measures of central tendency, correlation and regression and the statistical methods of studying data samples.
5.	BTCH101-18	CO1: Analyze microscopic chemistry in terms of atomic and molecular orbitals and intermolecular

	Chemistry-I (Theory)	forces. CO2: Rationalize bulk properties and processes using thermodynamic considerations CO3: Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques. CO4: Rationalize periodic properties such as ionization potential, electro negativity, oxidation states and electro negativity. CO5: List major chemical reactions that are used in the synthesis of molecules.
6.	BTCH102-18 Chemistry-I (Lab.)	CO1: Estimate rate constants of reactions from concentration of reactants/products as a function of time. CO2: Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc. CO3: Synthesize a small drug molecule and analyze a salt sample.
7.	BTPS101-18 Programming for Problem Solving (Theory)	CO1: To formulate simple algorithms for arithmetic and logical problems. CO2: To translate the algorithms to programs (in C language). CO3: To test and execute the programs and correct syntax and logical errors. CO4: To implement conditional branching, iteration and recursion. CO5: To decompose a problem into functions and synthesize a complete program using divide and conquer approach. CO6: To use arrays, pointers and structures to formulate algorithms and programs. CO7: To apply programming to solve matrix addition and multiplication problems and searching and sorting problems. CO8: To apply programming to solve simple numerical method problems, namely rot finding of function, differentiation of function and simple integration.
8.	BTPS102-18 Programming for Problem Solving (Lab)	CO1: To formulate the algorithms for simple problems. CO2: To translate given algorithms to a working and correct program. CO3: To be able to correct syntax errors as reported by the compilers. CO4: To be able to identify and correct logical errors encountered at run time. CO5: To be able to write iterative as well as recursive programs.

		CO6: To be able to represent data in arrays, strings and structures and manipulate them through a program. CO7: To be able to declare pointers of different types and use them in defining self referential structures. CO8: To be able to create, read and write to and from simple text files.
9.	BTMP101-18 Workshop/Manufacturing Practices (Theory & Lab.)	CO1: Upon completion of this course, the students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials. CO2: Upon completion of this laboratory course, students will be able to fabricate components with their own hands. CO3: They will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes. CO4: By assembling different components, they will be able to produce small devices of their interest.
10.	BTHU-101-18 English	CO1: The objective of the course is to help the students become the independent users of English language. CO2: Students will acquire basic proficiency in reading & listening, comprehension, writing and speaking skills. CO3: Students will be able to understand spoken and written English language, particularly the language of their chosen technical field. CO4: They will be able to converse fluently. CO5: They will be able to produce on their own clear and coherent texts.
11.	BTHU-102-18 English Laboratory	CO1: The objective of the course is to help the students become the independent users of English language. CO2: Students will acquire basic proficiency in listening and speaking skills. CO3: Students will be able to understand spoken English language, particularly the language of their chosen technical field. CO4: They will be able to converse fluently. CO5: They will be able to produce on their own clear and coherent texts.
12.	BTME101-18 Engineering Graphics &	CO1: Introduction to engineering design and its place in society. CO2: Exposure to the visual aspects of engineering design.

	Design (Theory & Lab.)	CO3: Exposure to engineering graphics standards. CO4: Exposure to solid modeling. CO5: Exposure to computer-aided geometric design. CO6: Exposure to creating working drawings. CO7: Exposure to engineering communication.
13.	BTIT-301-18 Data Structure & Algorithms	CO1: For a given algorithm student will able to analyze the algorithms to determine the time and computation complexity and justify the correctness. CO2: Student will be able to handle operation like searching, insertion, deletion, traversing on various Data Structures and determine time and computational complexity. CO3: Student will able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity. CO4: Students will be able to choose appropriate Data Structure as applied to specific problem definition. CO5: Demonstrate the reusability of Data Structures for implementing complex iterative problems.
14.	BTIT-302-18 Object Oriented Programming	CO1: Identify classes, objects, members of a class and the relationships among them needed to solve a specific problem; CO2: Demonstrate the concept of constructors and destructors. And create new definitions for some of the operators; CO3: Create function templates, overload function templates; CO4: Understand and demonstrate the concept of data encapsulation, inheritance, polymorphism with virtual functions; & CO5: Demonstrate the concept of file operations, streams in C++ and various I/O manipulators.
15.	BTIT-303-18 Data Structure & Algorithms Lab	CO1: Improve practical skills in designing and implementing basic linear data structure algorithms; CO2: Improve practical skills in designing and implementing Non-linear data structure algorithms; CO3: Use Linear and Non-Linear data

		structures to solve relevant problems; CO4: Choose appropriate Data Structure as applied to specific problem definition; & CO5: Implement Various searching algorithms and become familiar with their design methods.
16.	BTIT-304-18 Object Oriented Programming Lab	CO1: Develop classes incorporating object-oriented techniques; CO2: Design and implement object-oriented concepts of inheritance and polymorphism; CO3: Illustrate and implement STL class of containers and need for exceptions to handle errors for object oriented programs; & CO4: Design and implement any real world based problem involving GUI interface using object-oriented concepts.
17.	BTAM-304-18 Mathematics Paper-III (Calculus and Ordinary Differential Equations)	CO1: Understand the functions of several variables that are essential in most branches of engineering; CO2: Apply multiple integrals to deal with areas and volumes of various structures which are quite significant in real world; CO3: Formulate and solve engineering problems related to convergence, infinite series, power series and Taylor series; CO4: Create, select and utilize the learnt techniques of first degree ordinary differential equations to model real world problems &; CO5: Develop knowledge to solve higher order ordinary differential equations.
18.	BTES-301-18 Computer Organization & Architecture	CO1: Understand functional block diagram of microprocessor; CO2: Apply instruction set for Writing assembly language programs; CO3: Design a memory module and analyze its operation by interfacing with the CPU; CO4: Classify hardwired and micro programmed control units; & CO5: Understand the concept of pipelining and its performance metrics.
19.	BTES-301-18 Digital Electronics	CO1: Demonstrate the operation of simple digital gates, identify the symbols, develop the truth table for those gates; combine simple gates into more complex circuits; change

		binary, hexadecimal, octal numbers to their decimal equivalent and vice versa. CO2: Demonstrate the operation of a flip-flop. Design counters and clear the concept of shift registers. CO3: Study different types of memories and their applications. Convert digital signal into analog and vice versa.
20.	BTES-302-18 Digital Electronics Lab	CO1: Realize combinational circuits using logic gates. CO2: Realize sequential circuits using logic gates. CO3: Realize various types of Flip-flops and counters
21.	BTIT 401-18 Computer Networks	CO1. Explain the functions of the different layer of the OSI Protocol; CO2. Describe the function of each block of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs); CO3. Develop the network programming for a given problem related TCP/IP protocol; CO4. Configure DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.
22.	BTIT-402-18 Operating Systems	CO1: Explain basic operating system concepts such as overall architecture, system calls, user mode and kernel mode; CO2: Distinguish concepts related to processes, threads, process scheduling, race conditions and critical sections; CO3: Analyze and apply CPU scheduling algorithms, deadlock detection and prevention algorithms; CO4: Examine and categorize various memory management techniques like caching, paging, segmentation, virtual memory, and thrashing; CO5: Design and implement file management system; & CO6: Appraise high-level operating systems concepts such as file systems, disk-scheduling algorithms and various file systems.
23.	BTIT-403-18 Design and Analysis of	CO1: For a given algorithms analyze worst-case running times of algorithms based on

	Algorithms	asymptotic analysis and justify the correctness of algorithms; CO2: Explain when an algorithmic design situation calls for which design paradigm (greedy/ divide and conquer/backtrack etc.); CO3: Explain model for a given engineering problem, using tree or graph, and write the corresponding algorithm to solve the problems; CO4: Demonstrate the ways to analyze approximation/randomized algorithms (expected running time, probability of error); & CO5: Examine the necessity for NP class based problems and explain the use of heuristic techniques.
24.	BTIT 405-18 Operating Systems Lab	CO1: Understand and implement basic services and functionalities of the operating system; CO2: Analyze and simulate CPU Scheduling Algorithms like FCFS, Round Robin, SJF, and Priority; CO3: Implement commands for files and directories; CO4: Understand and implement the concepts of shell programming; CO5: Simulate file allocation and organization techniques; CO6: Understand the concepts of deadlock in operating systems and implement them in multiprogramming system.
25.	BTIT 406-18 Design and Analysis of Algorithms Lab	CO1: Improve practical skills in designing and implementing complex problems with different techniques; CO2. Understand comparative performance of strategies and hence choose appropriate, to apply to specific problem definition; CO3. Implement Various tree and graph based algorithms and become familiar with their design methods; CO4. Design and Implement heuristics for real world problems
26.	BTIT 404-18 Computer Networks Lab	CO1: Know about the various networking devices, tools and also understand the implementation of network topologies; CO2:Create various networking cables and know how to test these cables;

		CO3: Create and configure networks in packet tracer tool using various network devices and topologies; CO4:Understand IP addressing and configure networks using the subnetting; CO5:Configure routers using various router configuration commands; CO6: Troubleshoot the networks by using various networking commands.
27.	EVS 101-18 Environmental Studies	CO1. Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions. CO2. Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving. CO3. Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems. CO4. Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.
28.	BTCS 401-18 Discrete Mathematics	CO1. To be able to express logical sentence in terms of predicates, quantifiers, and logical connectives CO2. To derive the solution for a given problem using deductive logic and prove the solution based on logical inference CO3. For a given a mathematical problem, classify its algebraic structure CO4. To evaluate Boolean functions and simplify expressions using the properties of Boolean algebra CO5. To develop the given problem as graph networks and solve with techniques of graph theory.

29.	BTIT 501-18 Formal Language & Automata Theory	CO1: Write a formal notation for strings, languages and machines. CO2: Design finite automata to accept a set of strings of a language. CO3: Design context free grammars to generate strings of context free language. CO4: Determine equivalence of languages accepted by Push Down Automata and languages generated by context free grammars CO5: Distinguish between computability and non-computability and Decidability and undecidability.
30.	BTIT 502-18 Database Management Systems	CO1: write relational algebra expressions for a query and optimize the Developed expressions CO2: design the databases using ER method and normalization. CO3: construct the SQL queries for Open source and Commercial DBMS-MYSQL, ORACLE, and DB2. CO4: determine the transaction atomicity, consistency, isolation, and durability. CO5: Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling.
31.	BTIT 503-18 Programming in JAVA	CO1. Understand the features of Java such as operators, classes, objects, inheritance, packages and exception handling CO2. Learn latest features of Java like garbage collection, Console class, Network interface, APIs CO3.Acquire competence in Java through the use of multithreading, applets CO4. Get exposure to advance concepts like socket and database connectivity.
32.	BTIT 504-18 Software Engineering	CO1. Understanding of Software process models such as the waterfall, prototyping and spiral models CO2. Understanding of the role of project management including planning, scheduling, risk management, etc.

		CO3. Understanding of object models, data models, context models and behavioral models. CO4. Describe implementation issues such as modularity and coding standards. CO5. Understanding of software testing approaches such as unit testing, integration testing and system testing
33.	BTIT 506-18 Programming in JAVA	CO1. Implement the features of Java such as operators, classes, objects, inheritance, packages and exception handling CO2. Design problems using latest features of Java like garbage collection, Console class, Network interface, APIs CO3. Develop competence in Java through the use of multithreading, Applets etc CO4. Apply advance concepts like socket and database connectivity, and develop project based on industry orientation.
34.	BTIT 505-18 Database management System lab	CO1: This practical will enable students to retrieve data from relational databases using SQL. CO2: students will be able to implement generation of tables using data types CO3: Students will be able to design and execute the various data manipulation queries. CO4: Students will also learn to execute triggers, cursors, stored procedures etc.
35.	BTIT 507-18 Software Engineering Lab	CO1 Select a software engineering process life cycle model. CO2 Define the requirements of the software. CO3 Analyze the given specification into a design CO4 Contrast the various testing and quality assurance techniques. CO5 Apply modern engineering tools for specification, design, implementation.
36.	BTIT 509-18 Cyber laws and IPR	CO1. Explain the various digital crimes and comprehend the basic features of these crimes. CO2. Analyze how laws are enforced in the digital and cyber environment and the challenges that are forced in their enforcement. CO3. Understand to identify what is a Protectable Subject matter under Copyright Laws and what is the manner of obtaining Copyright protection.

		CO4. Gain expert knowledge in application of various provisions of Copyright law to determine the rights to which the IP holder will be entitled.
37.	BTIT 513-18 Cyber laws and IPR Lab	CO1. Learn the general principles in legal research and types of research Presentation/research CO2. Learn various legal research methods Presentation/research CO3. Understand the legal research processes and legal source Presentation/research CO4 Learn writing legal reports Presentation/legal writing 5 Understand the contemporary trends in legal research in India environments.
38.	HSMC 122-18 Universal Human Values 2: Understanding Harmony	CO1: Students are expected to become more aware of themselves, and their surroundings (family, society, nature); CO2: They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind. CO3: They would have better critical ability. CO4: They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society). CO5: They would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.
39.	Constitution of India/ Essence of Indian Traditional Knowledge	CO1. Able to understand historical background of the constitutional making and its importance for building a democratic India, the structure of Indian government, the structure of state government, the local Administration CO2. Able to apply the knowledge on directive principle of state policy, the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy. CO3. Able to analyze the History, features of Indian constitution, the role Governor and Chief Minister, role of state election commission, the decentralization of power

		between central, state and local self-government. Analysis CO4. Able to evaluate Preamble, Fundamental Rights and Duties, Zilla Panchayat, block level organization, various commissions of via SC/ST/OBC and women.
40.	BTIT 601-18 Compiler Design	CO1. Perform data gathering of large data from a range of data sources. CO2. Critically analyze existing Big Data datasets and implementations, taking practicality, and usefulness metrics into consideration. CO3. Understand the role of statistics in the analysis of large of datasets 4. Apply suitable statistical measures and analyses techniques for data of various structure and content and present summary statistics CO5. Demonstrate advanced knowledge of statistical data analytics as applied to large data sets.
41.	BTIT 604-18 Big Data Lab	CO1. List the components of Hadoop and Hadoop Eco-System CO2. Access and Process Data on Distributed File System CO3. Manage Job Execution in Hadoop Environment CO4.Develop Big Data Solutions using Hadoop Eco System CO5.Analyze Info sphere Big Insights Big Data
42.	BTIT 602-18 Web Technologies	CO1. Understand and apply the knowledge of web technology stack to deploy various web services. CO2. Analyze and evaluate web technology components for formulating web related problems. CO3. Design and develop interactive client server internet application that accommodates user specific requirements and constraint analysis. CO4. Program latest web technologies and tools by creating dynamic pages with an understanding of functions and objects. CO5. Apply advance concepts of web interface

		and database to build web projects in multidisciplinary environments. CO6. Demonstrate the use of advance technologies in dynamic websites to provide performance efficiency and reliability for customer satisfaction.
43.	BTIT 605-18 Web Technologies Lab	CO1. Students are able to develop a dynamic webpage by the use of java script and Students will be able to connect a java program to a DBMS and perform insert CO2. Students will be able to write a well formed / valid XML document. CO3. DHTML. Students will be able to write a server side java application called Servlet to catch CO4. Update and delete operations on DBMS table. Students will be able to write a server side java application called JSP to catch form CO5. Form data sent from client, process it and store it on database. Data sent from client and store it on database.
44.	BTIT 610-18 Cryptography and Network Security	CO1. Provide security of the data over the network. CO2. Do research in the emerging areas of cryptography and network security. CO3. Implement various networking protocols. CO4. Protect any network from the threats in the world.
45.	BTIT 610-18 Cryptography and Network Security Lab	CO1. Identify the security issues in the network and resolve it. CO2. Analyze the vulnerabilities in any computing system and hence be able to design a security solution. CO3. Evaluate security mechanisms using rigorous approaches by key ciphers and Hash functions. CO4. Demonstrate various network security applications, IPSec, Firewall, IDS, Web Security, Email Security and Malicious software etc.,
46.	BTIT 608-18 Machine Learning	CO1: Analyze methods and theories in the field of machine learning CO2: Analyze and extract features of complex datasets CO3: Deploy techniques to comment for the Regression CO4: Comprehend and

		apply different classification and clustering techniques CO5: Understand the concept of Neural Networks and Genetic Algorithm
47.	BTIT 616-18 Machine Learning Lab	CO1. Recognize the characteristics of machine learning that make it useful to real-world problems. CO2. Characterize machine learning algorithms as supervised, semi-supervised, and unsupervised. CO3. Effectively use machine learning toolboxes. CO4. Be able to use support vector machines.
48.	BTEC 402-18 Microprocessors and Microcontrollers	CO1. Understand architecture &functionalities of different building block of 8085 microprocessor. CO2. Understand working of different building blocks of 8051 microcontroller. CO3. Comprehend and apply programming aspects of 8051 microcontroller. CO4. Interface & interact with different peripherals and devices.
49.	BTIT 603-18 Project-1	CO1. Demonstrate a sound technical knowledge of their selected project topic. CO2. Undertake problem identification, formulation and solution. CO3. Design engineering solutions to complex problems utilising a systems approach. CO4. Conduct an engineering project. CO5. Communicate with engineers and the community at large in written an oral forms. CO6. Demonstrate the knowledge, skills and attitudes of a professional engineer.
50.	BTIT 701 Building Enterprise Applications	CO1. Familiarize with concept of Enterprise Analysis and Business Modeling. CO2. Understand requirements validation, planning and estimation. CO3. Design and document the application architecture. CO4. Understand the importance of application framework and designing other application components. CO5. Construct and develop different solution layers. CO6. Perform Code review, Code analysis, build process.

51.	BTIT 702 Software Project Management	CO1: Explain project management in terms of the software development process CO2: Estimate project cost and perform cost-benefit evaluation among projects CO3: Apply the concepts of project scheduling and risk management CO4: Explain Software configuration management and the concepts of contract management. CO5: Apply quality models in software projects for maintaining software quality and reliability
52.	BTIT 703 Project	CO1. Demonstrate a sound technical knowledge of their selected project topic. CO2. Undertake problem identification, formulation and solution. CO3. Design engineering solutions to complex problems utilising a systems approach. CO4. Conduct an engineering project. CO5. Communicate with engineers and the community at large in written an oral forms. CO6. Demonstrate the knowledge, skills and attitudes of a professional engineer.
53.	BTCS 704 Building Enterprise Applications Lab	CO1 Familiarize with concept of Enterprise Analysis and Business Modeling. CO2 Understand requirements validation, planning and estimation. CO3 Understand the importance of application framework and designing other application components. CO4 Perform Code review, Code analysis, builds process. CO5 Understand different testing involved with enterprise application and the process of rolling out an enterprise applications
54.	BTCS 916 Enterprise Resource Planning	CO1: To know the basics of ERP CO2: To understand the key implementation issues of ERP CO3: To know the business modules of ERP CO4: To be aware of some popular products in the area of ERP
55.	BTCS 906 Object Oriented Analysis and	CO1. Demonstrate the importance of modelling in the software development life cycle.

		CO2. Become familiar with the Unified modelling Language. CO3. Understand the object-oriented approach to analysing and designing systems and software solutions. Employ the Unified modelling Language notations to create effective and efficient system designs. CO4. Understand the difference between writing programs for the software and doing analysis and design. CO5. Problem formulation and decomposition (analysis) and solution building (design) will be covered.
56.	BTIT 801 Software Training	CO1. Gain practical experience of the corporate environment. CO2. Apply knowledge and skills learned in the classroom to solve real life problems. CO3. Understand career options in IT industry. CO4. Learn professional and corporate behavior and ethics. CO5. Enhance soft skills required for the industry. CO6. Identify areas for future learning and skill development. CO7. To learn project management skills. CO8. To study the industry profile, background, Vision, Mission, Quality policy, Product/service profile CO9. Detailed study of various departments and the product life cycle.
57.	BTIT 802 Industry Oriented Project Training	CO1: Students should be able to identify, formulate and analyze complex engineering problems. CO2: Students should be able to apply their knowledge and skills to IT environment. CO3: Students should be able to use computing and IT tools to improve efficiency and accuracy. CO4: Students should be able to use software which is used to manage the task and modules of software. CO5: Students should be able to measure the quality, cost and effectiveness of the project and the processes.

DEPARTMENT OF CIVIL ENGINEERING

Program Outcome

Students will have

a) An ability to apply knowledge of mathematics, science, and engineering

b) An ability to design and conduct experiments, as well as to analyze and interpret data

c) An ability to design a system, component, or process to meet desired need within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

d) An ability to function on multidisciplinary teams

e) An ability to identify, formulate, and solve engineering problems

f) An understanding of professional and ethical responsibility

g) An ability to communicate effectively

h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

i) A recognition of the need for, and an ability to engage in life-long learning

j) A knowledge of contemporary issues

k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

l) A knowledge and understanding of the management and finance concepts to estimate and manage projects in multidisciplinary environments.

Program Specific Outcomes

PSO 1: The ability to acquire and update knowledge continuously and offer engineering solutions to meet the environmental and societal needs.

PSO 2: The graduates will plan, produce detailed drawings, write specification, and prepare cost estimates.

PSO 3: To develop and design sustainable and smart infrastructure considering the global environmental challenges.

Course Outcomes of CE Department (2011 Onwards)

Serial No.	*Course Code and Name*	*Course outcomes*
1.	BTPH101-18 Mechanics of Solids	CO1: Understand the vector mechanics for a classical system CO2: Identify various types of forces in nature, frames of references, and conservation laws. CO3: Know the simple harmonic, damped, and forced simple harmonic oscillator for a mechanical system. CO4: Analyze the planar rigid body dynamics for a mechanical system CO5: Apply the knowledge obtained in this course to the related problems
2.	BTPH111-18 Mechanics of Solids Lab	CO1: Able to understand the concepts learned in the mechanics of solids CO2: Learning the skills needed to verify some of the concepts of theory courses. CO3: Trained in carrying out precise measurements and handling sensitive equipment. CO4: Able to understand the principles of error analysis and develop skills in experimental design. CO5: Able to document a technical report which communicates scientific information in a clear and concise manner.
3.	BTPH103-18 Electromagnetism	CO1: Specify the constitutive relationships for fields and understand their important. CO2: Describe the static and dynamic electric and magnetic fields for technologically important structures. CO3: Measure the voltage induced by time varying magnetic flux. CO4: Acquire the knowledge of Maxwell equation and electromagnetic field theory and propagation and reception of electro-magnetic wave systems. CO5: Have a solid foundation in engineering fundamentals required to solve problems and also to pursue higher studies.
4.	BTPH113-18 Electromagnetism Lab	CO1: Able to verify some of the theoretical concepts learnt in the theory courses. CO2: Trained in carrying out precise measurements and handling sensitive equipment. CO3: Understand the methods used for estimating and dealing with experimental uncertainties and systematic "errors." CO4: Learn to draw conclusions from data and develop skills in experimental design. CO5: Write a technical report which communicates scientific information in a clear and concise manner.

5.	BTPH104-18 Semiconductor Physics	CO1: Understand and explain the fundamental principles and properties of electronic materials and semiconductors CO2: Understand and describe the interaction of light with semiconductors in terms of fermi golden rule. CO3: Understand and describe the impact of solid-state device capabilities and limitations on electronic circuit performance. CO4: Understand the design, fabrication, and characterization techniques of Engineered semiconductor materials. CO5: Develop the basic tools with which they can study and test the newly developed devices and other semiconductor applications.
6.	BTPH114-18 Semiconductor Physics Lab	CO1: Able to verify some of the theoretical concepts learnt in the theory courses. CO2: Trained in carrying out precise measurements and handling sensitive equipment. CO3: Introduced to the methods used for estimating and dealing with experimental uncertainties and systematic "errors." CO4: Learn to draw conclusions from data and develop skills in experimental design. CO5: Write a technical report which communicates scientific information in a clear and concise manner.
7.	BTAM101-18 Mathematics-I (Calculus & Linear Algebra)	CO1: The fallouts of Rolle's Theorem that is fundamental to application of analysis to Engineering problems. CO2: To apply differential and integral calculus to evaluate definite, improper integrals and its applications. CO3: The convergence of sequence and series and to apply different tests of convergence. CO4: To deal with functions of several variables that are essential in most branches of engineering. CO5: The essential tool of matrices and linear algebra in a comprehensive manner.
8.	BTAM201-18 Mathematics-II (Differential equations)	CO1: The mathematical tools needed in evaluating multiple integrals and their usage. CO2: The effective mathematical tools for the solutions of differential equations that model physical processes. CO3: The tools of differentiation and integration of functions that are used in various techniques dealing engineering problems.
9.	BTCH101-18 Chemistry-I (Theory)	CO1: Analyze microscopic chemistry in terms of atomic and molecular orbital's and intermolecular forces. CO2: Rationalize bulk properties and processes using

		thermodynamic considerations CO3: Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques. CO4: Rationalize periodic properties such as ionization potential, electro negativity, oxidation states and electro negativity. CO5: List major chemical reactions that are used in the synthesis of molecules.
10.	BTCH102-18 Chemistry-I (Lab.)	CO1: Estimate rate constants of reactions from concentration of reactants/products as a function of time. CO2: Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc. CO3: Synthesize a small drug molecule and analyze a salt sample.
11.	BTPS101-18 Programming for Problem Solving (Theory)	CO1: To formulate simple algorithms for arithmetic and logical problems. CO2: To translate the algorithms to programs (in C language). CO3: To test and execute the programs and correct syntax and logical errors. CO4: To implement conditional branching, iteration and recursion. CO5: To decompose a problem into functions and synthesize a complete program using divide and conquer approach. CO6: To use arrays, pointers and structures to formulate algorithms and programs. CO7: To apply programming to solve matrix addition and multiplication problems and searching and sorting problems. CO8: To apply programming to solve simple numerical method problems, namely rot finding of function, differentiation of function and simple integration.
12.	BTPS102-18 Programming for Problem Solving (Lab)	CO1: To formulate the algorithms for simple problems. CO2: To translate given algorithms to a working and correct program. CO3: To be able to correct syntax errors as reported by the compilers. CO4: To be able to identify and correct logical errors encountered at run time. CO5: To be able to write iterative as well as recursive programs. CO6: To be able to represent data in arrays, strings and structures and manipulate them through a program.

		CO7: To be able to declare pointers of different types and use them in defining self referential structures. CO8: To be able to create, read and write to and from simple text files.
13.	BTMP101-18 Workshop/Manufacturing Practices (Theory & Lab.)	CO1: Upon completion of this course, the students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials. CO2: Upon completion of this laboratory course, students will be able to fabricate components with their own hands. CO3: They will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes. CO4: By assembling different components, they will be able to produce small devices of their interest.
14.	BTHU-101-18 English	CO1: The objective of the course is to help the students become the independent users of English language. CO2: Students will acquire basic proficiency in reading & listening, comprehension, writing and speaking skills. CO3: Students will be able to understand spoken and written English language, particularly the language of their chosen technical field. CO4: They will be able to converse fluently. CO5: They will be able to produce on their own clear and coherent texts.
15.	BTHU-102-18 English Laboratory	CO1: The objective of the course is to help the students become the independent users of English language. CO2: Students will acquire basic proficiency in listening and speaking skills. CO3: Students will be able to understand spoken English language, particularly the language of their chosen technical field. CO4: They will be able to converse fluently. CO5: They will be able to produce on their own clear and coherent texts.
16.	BTME101-18 Engineering Graphics & Design (Theory & Lab.)	CO1: Introduction to engineering design and its place in society. CO2: Exposure to the visual aspects of engineering design. CO3: Exposure to engineering graphics standards. CO4: Exposure to solid modeling. CO5: Exposure to computer-aided geometric design.

		CO6: Exposure to creating working drawings. CO7: Exposure to engineering communication.
17.	BTAM301 Engineering Mathematics-III:	CO 1 Understand the basic results on vector function, their properties and fields so as to apply them for solving problems of engineering. CO 2 Find length, area and volume using integral calculus that is an important application in engineering. CO 3 Solve some real problems in engineering using Gauss Divergence and Stokes' theorem CO 4 To formulate Laplace transform of functions and its applications to solve differential equations that form real life problems in engineering. CO 5 To formulate Fourier Series, its properties and its applications to solve problems in engineering.
18.	BTCE301 Fluid Mechanics-I:	CO 1 Understand the basic terms used in fluid mechanics and its broad principles CO 2. Estimate the forces induced on a plane/ submerged bodies CO3Formulate expressions using dimensionless approach and able to determine design parameters by creating replica of prototype at appropriate scale. CO 4 Apply the continuity, momentum and energy principles and design the pipelines used for water supply or sewage under different situation. CO 5 Calculate drag force exerted by fluid on the body of varying shapes and able to minimize them. CO 6 Design and addressing problems in open channel (lined/ unlined) of different shapes and size optimally as per site condition.

19.	BTCE302 Rock Mechanics & Engineering Geology:	CO 1 Geological classification of rocks, engineering classifications and index properties of intact rocks. CO 2 Characterization of rock discontinuities and their fundamental properties. Classification of rock masses. CO 3 In-situ stresses in rocks and methods of stress measurement and interpretations. Failure theories of rock including the Griffith criterion and Hoek and Brown criterion CO 4 Strength and deformation behavior of rock masses. The phenomenon and mechanism of time-dependent deformation of rocks and the measurement and interpretation of time-dependent deformation rock properties.
20.	BTCE304 Surveying:	CO 1 Understand the concept, various methods and techniques of surveying CO 2 Compute angles, distances and levels for given area. CO 3 Apply the concept of tachometry survey CO 4 Select appropriate instruments for data collection and survey purpose CO 5 Analyze and retrieve the information from remotely sensed data and interpret the data for survey. CO6. Understand the concepts related to GIS and GPS and analyze the geographical data.
21.	BTCE305 Building Material & Construction:	CO1 Interpret the different terms related to fluids. CO2 Calculate the pressure exerted by fluids on the walls of containers. CO3 Calculate discharge through pipes, irrigation channels, water supply pipe lines. CO4 Use different flow measurement devices like venturimeter, mouthpiece, notches, weir, orificemeter Calculate size of the pipe for carrying a particular discharge. CO5 Prepare the details like dimensions, slope of the irrigation, canals and water courses Differentiate between different type of water pumps used in the field. CO6 Measure the loss of head in pipes and channels.

22.	BTCE306 Fluid Mechanics Lab-I	CO1 Select appropriate pressure measuring device under different condition of flow. CO2 Determine the stability of a floating body. CO3 Understand and apply Bernoulli's theorem practically. CO4 Find discharge of fluid through pipe, orifices and in open channel. CO5 Estimate the major and minor losses in pipe. CO6 Estimate the various elements and energy losses in hydraulic jump.
23.	BTCE-307 Strength of Material Lab:	CO1 Determination of physical properties of steel including strength and ductility. CO2 Study of tensile and compressive stress-strain behavior of steel. CO 3 Compression test on brick. CO4 Development of shear stress-strain curve for steel in torsion. CO5 Determination of hardness of a material by Rockwell and Brinell hardness testing machine. CO6 Determination of impact strength of a material by Izod and Charpy tests. CO7 Determination of bending strength of a wooden beam specimen. CO8 Determination of fatigue strength of a material. CO 9 Study of behavior of columns and struts with different end conditions. CO 10 To verify the moment area theorem for slope and deflection of a given beam
24.	BTCE-305 Surveying Lab:	CO1 Visualize things/ concepts and express the thoughts in the form of sketches, models, etc CO 2 Create a well organized document using computers. CO 3 Work in teams. CO4 Acknowledge the work of other in a consistent manner. CO5 Understanding of ethical and professional issues.
25.	BTCE-401 Geomatics Engineering:	CO 1 Understand the concept, various methods and techniques of surveying CO 2 Compute angles, distances and levels for given area CO 3 Apply the concept of tachometry survey in

		difficult and hilly terrain. CO 4 Select appropriate instruments for data collection and survey purpose CO 5 Analyze and retrieve the information from remotely sensed data and interpret the data for survey. CO 6 Understand the concepts related to GIS and GPS and analyze the geographical data.
26.	BTCE-402 Construction Machinery & Works Management:	CO1 An understanding of modern construction practices CO2 A good idea of basic construction dynamics-various stakeholders, project objectives, CO3 processes, resources required and project economics CO4 A basic ability to plan, control and monitor construction projects with respect to time and cost CO 5 An idea of how to optimize construction projects based on costs CO6 An idea how construction projects are administered with respect to contract structures and issues.
27.	BTCE-403 Design Of Concrete Structures-I:	CO 1 On the successful completion of course the student will be able to understand the design of special component of pile and pile cap, CO 2 Student is able to design the deep beam, shear wall, rise tread and curved staircase design. CO 3 Student is able to understand the importance of Reinforcement detailing, and ductile detailing.
28.	BTCE- 404 Fluid Mechanics-II:	CO 1 Understand the basic terms used in fluid mechanics and its broad principles CO 2 Estimate the forces induced on a plane/ submerged bodies CO3 Formulate expressions using dimensionless approach and able to determine design parameters by creating replica of prototype at appropriate scale. CO 4 Apply the continuity, momentum and energy principles and design the pipelines used for water supply or sewage under different situation. CO 5 Calculate drag force exerted by fluid on the body of varying shapes and able to minimize them CO 6 Design and addressing problems in open channel (lined/ unlined) of different shapes and size optimally as per site condition..

29.	BTCE-405 Irrigation Engineering –I:	CO1 Understand the interaction among various processes in the hydrologic cycle. CO 2 Calculate the average annual rainfall of any area using the rain gauge data and inter-relations of various parameters as infiltration, evapotranspiration etc CO 3 Understand the various component of hydro graphs and able to estimate the run off. CO 4 Find the water requirement for different crops and able to proposed appropriate method of applying water. CO 5 Understand the distribution system of canal and various components of irrigation system. CO6 Classify dams and spillways, their problems and able to determine forces exerted by fluid on dams.
30.	BTCE-406 Structural Analysis- I:	CO 1 The students will be able to apply their knowledge of structural mechanics in addressing design problems of structural engineering CO 2 They will possess the skills to analyze and design concrete and steel structures CO 3 They will have knowledge of structural engineering.
31.	BTCE-407 Concrete Technology Lab	CO 1 Evaluate properties of building materials, such as cement and aggregate. CO2 Conduct experiments and check the acceptance criteria (if any). CO 3 Design concrete mixes as per BIS provisions. CO 4 Analyze the properties of concrete in fresh and hardened state. CO 5 Create a well organized document and present the results appropriately. CO 6 Understand and apply non destructive testing (NDT) for evaluating concrete quality.
32.	BTCE-408 Structural Analysis Lab:	CO 1 Deflection of a simply supported beam and verification of Clark-Maxwell's theorem. CO 2 To determine the Flexural Rigidity of a given beam. CO 3 Deflection of a fixed beam and influence line for reactions CO 4 Deflection studies for a overhang beam and influence line for reactions. CO5 Structural Drawings of Reinforced Concrete Elements such as Beams, Slabs.

33.	BTCE 501 Design of Steel Structures – I	CO 1 The students will be able to apply their knowledge of structural mechanics in addressing design problems of structural engineering CO 2 They will possess the skills to analyze and steel structures. CO 3 They will have knowledge of structural engineering.
34.	BTCE-502 Geotechnical Engineering	CO 1 Comprehend the various geotechnical field challenges and understand their fundamental, index and engineering properties and then use (apply) the soil as an engineering material. CO 2 Investigate and write the laboratory reports for soil design properties and parameters by apply the concept of permeability, total and effective stress approaches in soil strength determination CO 3 Apply the various specifications of compaction of soils in the construction of highways and earthen dams. CO4 Able to apply the knowledge of consolidation, soil deformation parameters, and calculate settlement magnitude and rate of settlement.
35.	BTCE-503 Structural Analysis-II	CO 1 To apply the knowledge for analysis and design of various components of a plate girder. CO 2 To analyze, evaluate and design the different types of beam-column connections. CO 3 To design the column bases and footings for a steel structure under various loading conditions. CO 4 To analyze the loads and design various elements of industrial buildings. CO 5 To demonstrate the basic knowledge of plastic analysis of simple steel elements.
36.	BTCE-504 Transportation Engineering – I	CO 1 Appreciate the importance of different modes of transportation and characterize the road transportation. CO 2 Alignment and geometry of pavement as per Indian Standards according to topography. CO3 Assess the properties of highway materials in laboratory CO4 Understand the importance of railway infrastructure planning and design. CO5 Identify the functions of different component of railway track. 6. Outline the importance of Airport Infrastructure

37.	BTCE-505 Environmental Engineering - I	CO 1 Understand the impact of humans on environment and environment on humans CO 2 Be able to identify and value the effect of the pollutants on the environment: atmosphere, water and soil. CO 3 Be able to plan strategies to control, reduce and monitor pollution. CO 4 Be able to select the most appropriate technique for the treatment of water, waste water, solid waste and contaminated air. CO 5 Be conversant with basic environmental legislation.
38.	BTCE-506 Transportation Engineering Lab	CO 1 Characterize the pavement materials as per the Indian Standard guidelines. CO 2 Evaluate the strength of sub grade soil by CBR test. CO3 Conduct experiments to evaluate aggregate properties. CO 4 Determine properties of bitumen material and mixes CO 5 Evaluate the pavement condition by rough meter and Benkelman beam test. CO 6 Create a well organized report and present the results appropriately.
39.	BTCE-507 Geotechnical Engineering Lab	CO 1 Determination of in-situ density by core cutter method and Sand replacement method. CO 2 Determination of Liquid Limit & Plastic Limit. CO 3 Determination of specific gravity of soil solids by pyconometer method. CO 4 Grain size analysis of sand and determination of uniformity coefficient (Cu) and coefficient of curvature (Cc). CO 5 Compaction test of soil.
40.	BTCE-508 Computer Aided Structural Drawing	CO 1 Visualize things/ concepts and express the thoughts in the form of sketches, models, etc CO 2 Create a well organized document using computers CO 3 Work in teams CO4 Acknowledge the work of other in a consistent manner CO 5 Understanding of ethical and professional issues CO6 Demonstrate effective oral communication and presentation skills

41.	BTCE-509 Survey Camp	CO1 Hands-on-training of modern surveying equipment such as Digital Theodolite, Total Stations, Autolevel, and GPS. CO2 On-site application of traversing, etc. for preparation of topographical maps of an area
42.	BTCE601 Design Of Concrete Structures-II	CO 1 To apply the loads on building frames and analyze them using direct and indirect methods. CO2 To analyze the concrete components i.e. continuous beams, flat slabs, tanks and retaining walls, etc CO3 To design and detail the concrete components i.e. curved beams, flat slabs, tanks and retaining walls, etc CO4 To analyze and design the special foundations i.e. raft, pile and machine foundations
43.	BTCE-602 Elements Of Earthquake Engineering	CO1 Appreciate the role of earthquake forces in structural design of building. CO 2 Apply various codal provisions related to seismic design of buildings. CO3 Acquire new basic knowledge in earthquake engineering.
44.	BTCE-604 Numerical Methods In Civil Engineering	CO1 Understand the methods of surface and subsoil exploration and to prepare investigation report. CO2 Estimate the stresses in soils and bearing capacity of soil for shallow foundation. CO3 Design various types of shallow foundation and to estimate settlement. CO4 Apply the concepts of deep foundation and solve problems related with pile foundation.
45.	BTCE-604 Numerical Methods In Civil Engineering	CO1 Exposure to various numerical methods for performing tasks, such as interpolation, differentiation, integration, solution of linear and nonlinear equations, solution of differential and integral equations CO2 Ability to apply numerical methods to obtain approximate solutions to mathematical problems. CO3 Ability to analyze and evaluate accuracy of various numerical methods and their applicability CO4 Exposure to established and advanced numerical methods like Finite Element Method, Mesh free Methods and Boundary Element Methods.

46.	BTCE-605 Professional Practice	CO1 To make the students understand the types of roles they are expected to play in the society as practitioners of the civil engineering profession CO2 To develop some ideas of the legal and practical aspects of their profession.
47.	BTCE-606 Environmental Engineering - Ii	CO1 Understand the impact of humans on environment and environment on humans CO2 Be able to identify and value the effect of the pollutants on the environment: atmosphere, water and soil. CO3 Be able to plan strategies to control, reduce and monitor pollution. CO4 Be able to select the most appropriate technique for the treatment of water, wastewater, solid waste and contaminated air. CO5 Be conversant with basic environmental legislation.
48.	BTCE-607 Environmental Engineering Laboratory	CO1 To measure the pH value of a water/waste water sample. CO2 To determine optimum Alum dose for Coagulation. CO3 To find MPN for the bacteriological examination of water. CO4 To find the turbidity of a given waste water/water sample CO5 To find B.O.D. of a given waste water sample. CO6To measure D.O. of a given sample of water.
49.	BTCE-608 Computer Aided Structural Drawing - II	CO1 Visualize things/ concepts and express the thoughts in the form of sketches, models, etc CO2 Create a well organized document using computers CO3 Work in teams CO4 Acknowledge the work of other in a consistent manner CO5 Understanding of ethical and professional issues CO6 Demonstrate effective oral communication and presentation skills.
50.	BTCE-701 Software And Industrial Training	CO 1 Students will be able to define compelling and viable problems. CO 2 Students will be able to develop skills to create practical solutions to identified problem. CO 3 Students will be able to interpret the

		software lifecycle model and other artifacts appropriate for problem. CO 4 Students will be able to identify and master tools required for the project. CO 5 Students will be able to plan and work systematically towards completion of a project works. CO 6 Students will be able to develop the ability to explain and defend their work in front of an evaluation panel.
51.	BTCE 801 Design of Steel Structures-II	CO 1 To apply the knowledge for analysis and design of various components of a plate girder. CO 2 To analyze, evaluate and design the different types of beam-column connections. CO 3 To design the column bases and footings for a steel structure under various loading conditions. CO 4 To analyze the loads and design various elements of industrial buildings. CO 5 To demonstrate the basic knowledge of plastic analysis of simple steel elements.
52.	BTCE 802 Disaster Management	CO 1 Identify various types of disasters, their causes, effects & mitigation measures. CO 2 Demonstrate the understanding of various phases of disaster management cycle and create vulnerability and risk maps. CO3 Understand the use of emergency management system to tackle the problems. CO4 Discuss the role of media, various agencies and organisations for effective disaster management. CO5 Design early warning system and understand the utilization of advanced technologies in disaster management. CO6 Compare different models for disaster management and plan & design of infrastructure for effective disaster management.
53.	BTCE-803 Irrigation Engineering-II	CO 1 Understand the interaction among various processes in the hydrologic cycle. CO2 Calculate the average annual rainfall of any area using the rain gauge data and inter-relations of various parameters as infiltration, evapotranspiration etc CO3 Understand the various component of hydro graphs and able to estimate the run off. CO4 Find the water requirement for different crops

		and able to proposed appropriate method of applying water. CO5 Understand the distribution system of canal and various components of irrigation system. CO6 Classify dams and spillways, their problems and able to determine forces exerted by fluid
54.	BTCE-804 Transportation Engineering-II	CO1 Appreciate the importance of different modes of transportation and characterize the road transportation. CO2 Alignment and geometry of pavement as per Indian Standards according to topography. CO3 Assess the properties of highway materials in laboratory CO4 Understand the importance of railway infrastructure planning and design. CO5 Identify the functions of different component of rail.
55.	BTCE- 810 Ground Improvement Techniques	CO1 Role of ground improvement in foundation engineering. CO2 Geotechnical problems in alluvial, lateritic and black cotton soils,. CO3 Methods of ground improvement Selection of suitable ground improvement techniques based on soil conditions.
56.	BTCE-820 Bridge Engineering:	CO1 To evaluate the basic design considerations for different types of bridge structure. CO2 To analyze the concrete and steel bridges as per the various loading standards of India. CO3 To design the main structure of the concrete and steel bridges. CO4 To design the various types sub-structure and bearings for a bridge. CO5 To demonstrate the various construction and maintenance methods for a bridge structure.
57.	BTCE-805 Major Project	CO1 Students will have the Knowledge and broad understanding of basic hardware components of the electronic and communication system. CO 2 Students can integrate the theory of their all Subjects for making the projects. CO 3 Students can apply the knowledge to formulate the problems related with electronic and communication fields and concepts on the project. CO 4 Students can develop and design new projects by implementing the knowledge from the advance and recent technology.

Course Outcomes of CE Department (2018 Batch)

S. No	*Course Code and Name*	*Course outcomes*
1.	BTCE-301- 18 Surveying & Geomatics	CO 1 Understand the concept, various methods and techniques of surveying CO 2 Compute angles, distances and levels for given area CO 3 Apply the concept of tachometry survey in difficult and hilly terrain. CO 4 Select appropriate instruments for data collection and survey purpose CO 5 Analyze and retrieve the information from remotely sensed data and interpret the data for survey. CO 6 Understand the concepts related to GIS and GPS and analyze the geographical data.
2.	BTCE302-18 Solid Mechanics	CO1 Understand the concept of static equilibrium, deformations, and material constitutive behaviour. CO 2 Describe the concepts of stress, strain and elastic behaviour of materials including Hooke's law relationships to analyze structural members subjected to tension, compression and torsion. CO3 Apply the concept of Mohr's circle in the stress/strain calculations. CO4 Develop SFD and BMD for different type of beams subjected to different types of loads CO5 Plot elastic curves for beams undergoing displacements under different loadings CO 6 Understand the behaviour of columns and struts under axial loading.
3.	BTCE-303- 18 Fluid Mechanics	CO1 Understand the basic terms used in fluid mechanics and its broad principles CO2 Estimate the forces induced on a plane/ submerged bodies CO3 Formulate expressions using dimensionless approach and able to determine design parameters by creating replica of prototype at appropriate scale. CO4 Apply the continuity, momentum and energy principles and design the pipelines used for water supply or sewage under different situation.

		CO5 Calculate drag force exerted by fluid on the body of varying shapes and able to minimize them. CO6 Design and addressing problems in open channel (lined/ unlined) of different shapes and size optimally as per site condition.
4.	BTAM-301- 18 Mathematics-III (Transform & Discrete Mathematics)	CO1 Understand the basic results on vector function, their properties and fields so as to apply them for solving problems of engineering. CO2 Find length, area and volume using integral calculus that is an important application in engineering. CO3 Solve some real problems in engineering using Gauss Divergence and Stokes' theorem CO4 To formulate Laplace transform of functions and its applications to solve differential equations that form real life problems in engineering. CO5 To formulate Fourier Series, its properties and its applications to solve problems in engineering.
5.	BTEC- 305- 18 Basic Electronics & applications in Civil Engineering	CO1 Understand construction of diodes and their rectifier applications. CO2 Appreciate the construction and working bipolar junction transistors and MOSFETs. CO3 Design Op-Amp IC based fundamental applications. CO4 Comprehend working of basic elements of digital electronics and circuits.
6.	HSMC-132- 18 Civil Engineering- Introduction, Societal & Global Impact	CO1 Introduction to what constitutes Civil Engineering CO2 Understanding the vast interfaces this field has with the society at large CO3 Providing inspiration for doing creative and innovative work for the benefit of the society CO4 Need to think innovatively to ensure Sustainability CO5 Highlighting the depth of engagement possible within civil engineering and exploration of various possibilities of a career in this field.

7.	BTCE-306- 18 Surveying & Geomatics Lab	CO1 Assess horizontal & vertical angles by Theodolite. CO2 Survey the area using different methods of plane tabling and compass survey and to adjust the compass traverse graphically. CO3 Compute the reduce levels using various methods of levelling. CO4 Predict the location of any point horizontally and vertically using Tachometry. CO5 Setting out curves in the field. CO6 Use electronic survey instruments. Curve for steel in torsion.
8.	BTCE-307- 18 Fluid Mechanics Lab	CO1 Select appropriate pressure measuring device under different condition off low. CO2 Determine the stability of a floating body. CO3 Understand and apply Bernoulli's theorem practically. CO4 Find discharge of fluid through pipe, orifices and in open channel. CO5 Estimate the major and minor losses in pipe. CO6 Estimate the various elements and energy losses in hydraulic jump.
9.	BTCE-308- 18 Solid Mechanics Lab	CO1 Understand the importance of physical properties of steel. CO2 Identify and comprehend code provisions for testing different properties of steel. CO3 Develop stress-strain curve for axial compression, axial tension and shear. CO4 Assess hardness and impact strength of steel. CO5 Assess flexural strength of a given material. CO6 Evaluate fatigue and impact strength of steel.
10.	BMPD- 301-18 Mentoring and professional development	CO 1 Overall Personality CO 2 Aptitude (Technical and General) CO 3 General Awareness (Current Affairs and GK) CO 4 Communication Skills CO 5 Presentation Skills

11.	BTCE- 332-18 Training -I	CO1 Visualize things/ concepts and express the thoughts in the form of sketches, models, etc CO2 Create a well organized document using computers CO3Work in teams CO4 Acknowledge the work of other in a consistent manner CO5 Understanding of ethical and professional issues CO6 Demonstrate effective oral communication and presentation skills
12.	BTCE-401- 18 Concrete Technology	CO1 Understand the relevance of different properties of constituent materials on properties of concrete. CO2 Understand the behaviour and durability aspects of concrete under different loading and exposure conditions. CO3 Understand the issues involved in production and use of concrete. CO4 Design of concrete mixes as per BIS specifications. CO5 Understand various testing methods for concrete and their applicability. CO6 Knowledge of special type of non-conventional concretes.
13.	BTCE-402- 18 Materials, Testing & Evaluation	CO1 Appraisal about the role of materials in civil engineering CO2 Introduce common measurement instruments, equipments and devices to capture the material response under loading CO3 Exposure to a variety of established material testing procedures/techniques and the relevant codes of practice CO4 Ability to write a technical laboratory report.
14.	BTCE-403- 18 Hydrology & Water Resources Engineering	CO1 Understand the interaction among various processes in the hydrologic cycle. CO2 Calculate the average annual rainfall of any area using the rain gauge data and inter-relations of various parameters as infiltration, evapotranspiration etc CO3 Understand the various component of hydro graphs and able to estimate the run off.

		CO4 Find the water requirement for different crops and able to proposed appropriate method of applying water. CO5 Understand the distribution system of canal and various components of irrigation system. CO6 Classify dams and spillways, their problems and able to determine forces exerted by fluid on dams.
15.	BTCE-404- 18 Transportation Engineering	CO1 Appreciate the importance of different modes of transportation and characterize the road transportation. CO2 Alignment and geometry of pavement as per Indian Standards according to topography. CO3 Assess the properties of highway materials in laboratory CO4 Understand the importance of railway infrastructure planning and design. CO5 Identify the functions of different component of railway track. CO6 Outline the importance of Airport Infrastructure
16.	BTCE-405- 18 Disaster Preparedness & Planning	CO1 Identify various types of disasters, their causes, effects & mitigation measures. CO2 Demonstrate the understanding of various phases of disaster management cycle and create vulnerability and risk maps. CO3 Understand the use of emergency management system to tackle the problems. CO4 Discuss the role of media, various agencies and organisations for effective disaster management. CO5 Design early warning system and understand the utilization of advanced technologies in disaster management. CO6 Compare different models for disaster management and plan & design of infrastructure for effective disaster management.
17.	EVS-101-18 Environmental Science	CO1 Students will enable to understand environmental problems at local and national level through literature and general awareness. CO2 The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various

		personalities who have done practical work on various environmental Issues. CO3 The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate these problems. CO4 Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.
18.	BTCE-406- 18 Concrete Testing Lab	CO1 Evaluate properties of building materials, such as cement and aggregates. CO2 Conduct experiments and checks the acceptance criteria (if any). CO3 Design concrete mixes as per BIS provisions. CO4 Analyze the properties of concrete in fresh and hardened state. CO5 Create a well organized document and present the results appropriately. CO6 Understand and apply non destructive testing (NDT) for evaluating concrete quality.
19.	BTCE-407- 18 Transportation Lab	CO 1 Characterize the pavement materials as per the Indian Standard guidelines. CO2 Evaluate the strength of subgrade soil by CBR test. CO3 Conduct experiments to evaluate aggregate properties. CO4 Determine properties of bitumen material and mixes CO5 Evaluate the pavement condition by rough meter and Benkelman beam test. CO6 Create a well organized report and present the results appropriately
20.	BTCE-432-18 Training-II	CO1 Survey camp of an area (2 weeks) CO2 Hands-on-training of modern surveying equipment such as Digital Theodolite, Total Stations, Autolevel, and GPS. CO3 On-site application of traversing, etc. for preparation of topographical maps of an area. CO 4 – 4 week Summer Internship in Industry/ Construction site/ Appropriate workplace

	BMPD- 401-18 Mentoring and professional development	CO1 Part – A (Class Activities)- Expert and video lectures ,Aptitude Test ,Group Discussion ,Quiz (General/Technical) , Presentations by the students ,Team building Exercises. CO2 Part – B (Outdoor Activities) ,Sports/NSS/NCC ,Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, Cultural Club, etc.
21.	BTCE- 501-18 Engineering Geology	CO1 The basic concepts of geological processes and their importance in civil Engineering CO2 Identification of rocks and minerals and their characteristics CO3 Significance of geological structures and processes in civil engineering projects CO4 Site characterization and geologic considerations in construction.
22.	BTCE-502-18 Elements of Earthquake Engineering	CO1 Appreciate the role of earthquake forces in structural design of building. CO2 Apply various codal provisions related to seismic design of buildings. CO3 Acquire new basic knowledge in earthquake engineering.
23.	BTCE-503-18 Construction Engineering & Management	CO1 An understanding of modern construction practices CO2 A good idea of basic construction dynamics- various stakeholders, project objectives, CO3 processes, resources required and project economics CO4 A basic ability to plan, control and monitor construction projects CO5 An idea of how to optimise construction projects based on costs CO6 An idea how construction projects are administered with respect to contract structures and issues.
24.	BTCE-504-18 Environmental Engineering	CO1 Understand the impact of humans on environment and environment on humans CO2 Be able to identify and value the effect of the pollutants on the environment: atmosphere, water and soil. CO3 Be able to plan strategies to control, reduce and monitor pollution. CO4 Be able to select the most appropriate technique for the treatment of water, waste

		water, solid waste and contaminated air. CO5 Be conversant with basic environmental legislation.
25.	BTCE-505-18 Structural Engineering	CO1 The students will be able to apply their knowledge of structural mechanics in addressing design problems of structural engineering CO2 They will possess the skills to analyse and design concrete and steel structures CO3 They will have knowledge of structural engineering.
26.	BTCE-506-18 Geotechnical Engineering	CO1 Comprehend the various geotechnical field challenges and understand their fundamental, index and engineering properties and then use (apply) the soil as an engineering material. CO2 Investigate and write the laboratory reports for soil design properties and parameters by apply the concept of permeability, total and effective stress approaches in soil strength determination CO3 Apply the various specifications of compaction of soils in the construction of highways and earthen dams. CO4 Able to apply the knowledge of consolidation, soil deformation parameters, and calculate settlement magnitude and rate of settlement. CO5 Design the embankment slopes and check the stability of finite slopes.
27.	BTCE-507-18 Geotechnical Lab	CO1 Determination of in-situ density by core cutter method and Sand replacement method. CO2 Determination of Liquid Limit & Plastic Limit. CO3 Determination of specific gravity of soil solids by pyconometer method. CO4 Grain size analysis of sand and determination of uniformity coefficient (Cu) and coefficient of curvature (Cc), Compaction test of soil. CO5 Determination of Relative Density of soil. CO6 Determination of permeability by Constant Head Method. CO7 Determination of permeability by Variable

		Head method. CO8 Unconfined Compression Test for fine grained soil,Direct Shear Test ,Triaxial Test ,Swell Pressure Test .
28.	BTCE-508-18 Environmental Engineering Lab	CO1 To measure the pH value of a water/waste water sample. CO2 To determine optimum Alum dose for Coagulation. CO3 To find MPN for the bacteriological examination of water. CO4 To find the turbidity of a given waste water/water sample CO5 To find B.O.D. of a given waste water sample. CO6 To measure D.O. of a given sample of water.
29.	BTCE-509-18 Structural Lab	CO1 Deflection of a simply supported beam and verification of Clark-Maxwell's theorem. CO2 To determine the Flexural Rigidity of a given beam. CO3 Deflection of a fixed beam and influence line for reactions. CO4 Deflection studies for a overhang beam and influence line for reactions. CO5 Structural Drawings of Reinforced Concrete Elements such as Beams, Slabs. CO6 Structural Drawings of Steel Elements such as Connections, Tension Members, Compression Members, Beams.
30.	BMPD-501-18 Mentoring and professional development	CO1 Part – A (Class Activities)- Expert and video lectures ,Aptitude Test ,Group Discussion ,Quiz (General/Technical) , Presentations by the students ,Team building Exercises. CO2 Part – B (Outdoor Activities) ,Sports/NSS/NCC ,Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, Cultural Club, etc.
31.	BTCE-601-18 Engineering Economics, Estimation &Costing	CO1 Have an idea of basic principles and elements of economics in general. CO2 Be able to carry out and evaluate benefit/cost, life cycle and breakeven analyses CO3 Be able to understand the technical specifications for various works to be performed for a project and how they impact the cost of a structure.

		CO4 Be able to quantify the worth of a structure by evaluating quantities of constituents, derive their cost rates and build up the overall cost of the structure. CO5 Be able to understand how competitive bidding works and how to submit a competitive bid proposal.
32.	PECE-602A-18 Foundation Engineering	CO1 Understand the methods of surface and subsoil exploration and to prepare investigation report. CO2 Estimate the stresses in soils and bearing capacity of soil for shallow foundation. CO3 Design various types of shallow foundation and to estimate settlement. 4 CO4 Apply the concepts of deep foundation and solve problems related with pile foundation.
33.	PECE-603F-18 Bridge Engineering	CO1 To evaluate the basic design considerations for different types of bridge structure. CO2 To analyse the concrete and steel bridges as per the various loading standards of India. CO3 To design the main structure of the concrete and steel bridges. CO4 To design the various types sub-structure and bearings for a bridge. CO5 To demonstrate the various construction and maintenance methods for a bridge structure.
34.	PECE-604E-18 Contract Management	CO1 To make Civil Engineering students able to analyze. CO2 Evaluate and design construction contract documents.
35.	BTCS402-18- Operationg Systerm	CO1 Explain basic operating system concepts such as overall architecture, system calls, user mode and kernel mode. CO2 Distinguish concepts related to processes, threads, process scheduling, race conditions and critical sections. CO3 Analyze and apply CPU scheduling algorithms, deadlock detection and prevention algorithms. CO4 Examine and categorize various memory management techniques like caching, paging, segmentation, virtual memory, and thrashing. CO5 Design and implement file management

		system; CO6 Appraise high-level operating systems concepts such as file systems, disk-scheduling algorithms and various file systems.
36.	BTEC-601-18 -Wireless Communications	CO1 Understand the basic elements of Cellular Radio Systems and its design CO2 Learn about the concepts Digital communication through fading multipath channels CO3 Understand various Multiple Access techniques for Wireless communication CO4 Know about the Wireless standards and systems .
37.	BTMC-101-18 Constitution of India	CO1 To understand the structure of executive, legislature and judiciary CO2 To understand philosophy of fundamental rights and duties CO3 To understand the autonomous nature of constitutional bodies like Supreme Court and high court, controller and auditor general of India and election commission of India. CO4 To understand the central and state relation, financial and administrative.
38.	BMPD-601-18 Mentoring and Professional Development	CO1 Part – A (Class Activities)- Expert and video lectures ,Aptitude Test ,Group Discussion ,Quiz (General/Technical) , Presentations by the students ,Team building Exercises. CO2 Part – B (Outdoor Activities) ,Sports/NSS/NCC ,Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, Cultural Club, etc.
39.	BTCE-801-18 Software And Industrial Training	CO1 Students will be able to define compelling and viable problems . CO2 Students will be able to develop skills to create practical solutions to identified problem. CO3 Students will be able to interpret the software lifecycle model and other artifacts appropriate for problem. CO4 Students will be able to identify and master tools required for the project. CO5 Students will be able to plan and work systematically towards completion of a project works. CO6 Students will be able to develop the ability

		to explain and defend their work in front of an evaluation panel.
40.	PECE -701D-18- Highway Construction and Management	CO1 Understand various materials and techniques used to construct pavements. CO2 Design the bituminous pavement as per standards. CO3 Design thickness and joints including drainage of concrete pavements. CO4 Suggest maintenance of pavement. CO5 Conceptualize pavement management systems.
41.	PECE-702B-18 -Rural water Supply And onsite Sanitation Systems	CO1 Student should be able to make technology choice to deal with water quality issues, operate and maintain working treatment systems and do troubleshooting of the problems in these systems. CO2 The student will be able to apply the knowledge gained from the subject in EIA studies for water component and water pollution control strategies.
42.	OECE-701-18- Open Elective – III(Metro system and Engg)	CO1 Introduction toMetro systems Overview of Metro Systems; Need for Metros; Routing studies; Basic Planning and Financials. CO2 Planning and Development Overview and construction methods for: Elevated and underground Stations; Viaductpansandbridges;Undergroundtunnels;Depots;CommercialandServicebuildings.
43.	PECE-703C-18 -Ground Water	CO1 use information from wells, the topography of the ground and a water table contour map, to carry out the following: interpret cross-sections, CO2 calculate the thickness of the unsaturated zone, CO3 the rate of groundwater flow; deduce the direction in which groundwater is flowing; and estimate the depth to the saline interface in a coastal area from the height of the water table
44.	Project	CO1 To make them understand the concepts of Project Management for planning to execution projects. CO2 To make them understand the feasibility analysis in Project Management and network analysis tools for cost and time estimation.

		CO3 To enable them to comprehend the fundamentals of Contract Administration, Costing and Budgeting. CO4 Make them capable to analyze, apply and appreciate contemporary project management tools and methodologies in Indian context.
45.	HSMC-255 Professional Practice, Law &Ethics	CO1 To make the students understand the types of roles they are expected to play in the CO2 society as practitioners of the civil engineering profession CO3To develop some ideas of the legal and practical aspects of their profession.
46.	BTMC-701-18 Management- I (Organizational Behaviour)	CO1 Individuals – Behaviour in an individual context CO2 Groups/teams – Behaviour in a n organizational context CO3 Organizations – How do these artificial persons behave

DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS

Program Outcome

Students will have

- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to design and conduct experiments, as well as to analyze and interpret data.
- An ability to design a system, component, or process to meet desired need within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- An ability to function on multidisciplinary teams.
- An ability to identify, formulate, and solve engineering problems.
- An understanding of professional and ethical responsibility.
- An ability to communicate effectively.
- The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- A recognition of the need for an ability to engage in life-long learning.
- A knowledge of contemporary issues.
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- A knowledge and understanding of the management and finance concepts to estimate and manage projects in multidisciplinary environments.

Program Specific Outcomes

PSO 1: Use of recent technology, skill and knowledge for computing practice with commitment on societal, moral values.

PSO 2: Work professionally with positive attitude as an individual or in multidisciplinary teams and communicate effectively.

PSO 3: Ability to enhance and develop techniques for independent and lifelong learning in computer application.

Course Outcomes of Master of Computer Applications

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	MCA 101 Information Management	CO1: Students should be able to describe various I/O Devices. CO2: Students should be able to describe IT Infrastructure. CO3: Students should be able to apply Management Information System. CO4: Students should be able to apply Various automation tools like Word, Excel etc.
2.	MCA 102 Object Oriented Programming in C++	CO1: To learn programming from real world examples. CO2: To understand Object oriented approach for finding Solutions to various problems with the help of C++ language. CO3: To create computer based solutions to various real-world problems using C++ CO4: To learn various concepts of object oriented approach towards problem solving CO5: To learn programming from real world examples. CO6: To understand Object oriented approach for finding
3.	MCA 103 Computer Organization and Assembly Language	CO1: Students will apply the knowledge of the computer registers and instructions for designing a basic computer system. CO2: Students will have a comprehend idea about the register transfer languages and operations for designing of a complete basic computer and its working. CO3: Student will be able to apply the knowledge of input-output organization and different modes of data transfer. CO4: Student will have an ability to analyze the design of a pipelined CPU and the concept of Parallel processing. CO5: Students will learn about the designing of different types of control units. CO6: A knowledge base to design and develop applications using assembly language. CO7: The ability to combine assembly and high-

		level language modules.
4.	MCA 104 Accounting & Financial Management	CO1:Students will be able to understand basic fundamentals of accounting. CO2: Students will be able to understand to understand basic operations of business transactions CO3: Students will be able to understand basic banking operations. CO4: Students will be able to understand final accounts and importance of accounting in business.
5.	MCA105 Technical Communication	CO1: Students should be able to speak in English, in real life situation. CO2: Students should inculcate reading habits and gain effective reading skills. CO3: Students should learn more on active and passive vocabulary. CO4: Students should develop listening skills for academic and professional purpose. CO5: Students should be able to comprehend scientific and technical English. CO6: Students should develop writing skills to prepare CVs, letters and reports in formal and business situations. CO7: Students should be able to analyze and interpret engineering problems expressed in English.
6.	MCA 106 Software Lab- I (Information Management)	CO1: Design data-intensive applications using cutting edge technologies tailored to the specific needs of any business scenario. CO2: Implement the core aspects of information technology in a business. CO3: Understand the strategic and operational benefits of business models and technology applications. CO4: Create the information management principles and tools to manage a business. CO5: Develop the knowledge for various Information Systems.
7.	MCA 107 Software Lab –II (Object Oriented Programming in C++)	CO1: Students should be able to construct programs using classes and objects. CO2Students should be able to create programs using constructors, destructors and initializer list. CO3: Students should be able to develop operator overloading and type casting programs. CO 4: Students should be able to demonstrate inheritance, polymorphism. CO 5:Students should be able to design Templates

		and manipulation of files CO 6: Students should be able to formulate file handling.
8.	MCA 201 Mathematical Foundations of Computer Science	CO1: Knowledge of Sets, Relations and their properties with functions including Hashing functions. CO2: Gain Knowledge to reason mathematically about basic data types and structures (such as numbers, sets, graphs, and trees) used in computer algorithms and systems. CO3: Knowledge of model and analyze computational processes using analytic and combinatorial methods. CO4: Gain knowledge to apply principles of discrete probability to calculate probabilities and expectations of simple random processes. CO5: Knowledge of Matrix Algebra
9.	MCA 202 Relational Database Management System	CO1: Students will be able to understand the structure of DBMS and how it is organized level by level. CO2: Students will be able to do SQL queries thoroughly to store and retrieve data. CO3: Students will be able to do PL/ SQL programs, cursors, triggers thoroughly. CO4: Students will be able to do normalization to handle different types of anomalies. CO5: Students will be able to handle different RDBMS.
10.	MCA 203 Data Structures	CO1: Describe the usage of various data structures. CO2: Student will be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures. CO3: Student will be able to choose appropriate data structure as applied to specified problem definition. CO4: Recognize the associated algorithms operations and complexity. CO5: Develop computer programs to implement different data structures and related algorithms.
11.	MCA 204 Data Communication and Networks	CO1: Describe the usage of various data structures. CO2: Student will be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures. CO3: Student will be able to choose appropriate data structure as applied to specified problem definition. CO4: Recognize the associated algorithms operations

		and complexity. CO5: Develop computer programs to implement different data structures and related algorithms.
12.	MCA 205 Linux Operating System	CO1: Students should be able to Gain Knowledge about the basic operating system. CO2: Students should be able to Understand the Linux Operating system. CO3: Students should be able to understand the management of users. CO4: Students should be able to learn different commands in LINUX. CO5: Students should be able to Boot the system. CO6: Students should be able to manage files, core system services and Printing.
13.	MCA 206 Software Lab –III (Relational Database Management System)	CO1: Understand the basic concepts of DBMS. CO2: Formulate, using SQL, solutions to a broad range of query and data update problems. CO3:Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database CO4: Understand the concept of Transaction and Query processing in DBMS.
14.	MCA 207 Software Lab –IV (Data Structures)	CO1:Apply appropriate constructs of Programming language, coding standards for application development CO2:Develop programming skills for solving problems. CO3:Apply appropriate searching and/or sorting techniques for application development.
15.	MCA 208 Software Lab –V (Based on Linux operating system)	CO1:Explain the fundamental concepts of open-source operating system Linux CO2: Understand the basic set of commands and editors in Linux operating system. CO3:Discuss shell programming in Linux operating system CO4:Demonstrate the role and responsibilities of a Linux system administrator CO5:Distinguish various filter and server commands
16.	MCA 301 Database Administration	CO1: Students should be able to define database administrator's roles and responsibilities and also able to install and upgrade database packages. CO2: Students should be able to implement business polices, database compression and also import and export the database. CO3: Students should be able to apply security

		methods against threats and restore or recover the database. CO4: Students should be able to learn the monitoring and optimizing performance of the database.
17.	MCA 302 Information Security	CO1: Students should be able to have complete understanding of the security issues surrounding networks. CO2:Students should be able to have detailed and critical understanding of the concepts, issues, principles and theories of computer network security CO3:Students should be able to have detailed and practical understanding of formalisms for specifying security related properties and validating them using model checking CO5:Students should be able to have theoretical and detailed practical knowledge of a range of computer network security technologies as well as network security tools and services CO6: Students should be able to understand and apply the concepts for administrating a small company's network. CO7: Students should be able to provide practical experience of analyzing, designing, implementing and validating solutions to computer network security challenges using common network security tools and formal methods.
18.	MCA 303 Software Engineering& Project Management	CO1: Students should be able to understand the basics of S/W engineering. CO2: Students should be able to classify the various models. CO3: Students should be able to apply the concept of project management. CO4: Students should be able to analyze the software using various testing methods. CO5: Students should be able to do quality control.
19.	MCA 304 Java Programming	CO1:Students will be able to write, compile & execute basic java program CO2: The student will be able to learn the use of data types & variables, decision control structures: if, nested if etc. CO3: The student will be able to use loop control structures: do, while, for and will be able to create classes and objects and use them in their program. CO4: The student will be able create and use threads, handle exceptions and write applets.

		CO5: The student will be able to learn the use oops concept i.e. data abstraction & data hiding, encapsulation, inheritance, polymorphism.
20.	MCA 305 A System Programming	CO1:Students should be able to describe various system programs. CO2: Students should be able to assimilate as to how system programs like assemblers & compilers translate source codes. CO3:Students should be able to discuss data structures and algorithms behind system programs like assemblers & compilers. CO4:Students should be able select appropriate system-program design strategies to implement specific system software, for example, whether to use single pass or two pass for assembler. CO5:Students should be able to understand the design of various system software's like linker and loaders. CO6:Students should be able to discuss various system programs like editors & debuggers
21.	MCA 306 Software Lab-VI [Database Administration	CO1: Understand, analyze and apply common SQL statements including DDL, DML and DCL statements to perform different operations. CO2: Design different views of tables for different users and to apply embedded and nested queries. CO3:Design and implement a database for a given problem according to well-known design principles that balance data retrieval performance with data consistency. CO4:Demonstrate and understand relational algebra in Database which is helpful to design related database software components. CO5:Identify the user requirements from a typical business situation, and to document them.
22.	MCA 307 Software Lab-VII [Java Programming]	CO1: Implement Core Java concepts. CO2: Solve computational problems using various operators of Java. CO3: Design solutions to complex by handling exceptions that may occur in the programs. CO4: Solve complex and large problems using the concept of multithreading. CO5: Implement interfaces and design packages. Implement Core Java concepts.
23.	MCA 401 Mobile Application	CO1: Students will be able to do work on Android OS.

	Development	CO2: Students will be able to create different type of Android based applications. CO3: Students will be able to discuss various security issues in Android platform. CO4: Students will be able to implement various database applications and content providers. CO5: Students will be able to differentiate among various types of operating systems.
24.	MCA 402 E- Commerce & Web Application Development	CO1:Understand various applications and scope of ecommerce. CO2:Acquire knowledge of various payment modes used in ecommerce today. CO3:Learn to develop, evaluate, and execute a comprehensive digital marketing strategy and plan CO4:Understand the major digital marketing channels - online advertising: Digital display, video, mobile, search engine, and social media CO5:Describe how and why to use digital marketing for multiple goals within a larger marketing and/or media strategy, CO6:Developing effective digital and social media
25.	MCA 403 Interactive Computer Graphics	CO1: Students will develop programs for lines and circle drawing. CO2: Students will program the hidden surface elimination technique and demonstrate the rotation of the 3d object. CO3: Students will write program functions to implement the different transformations that includes rotation, translation, scaling of 2d objects. CO4: Students will be able to construct curves and irregular patterns. CO5: Students will write programs that demonstrate computer graphics animations.
26.	MCA 404 Advanced Operating Systems	CO1: Discuss the evaluation of operating systems. CO2: Explain different resource managements performed by operating system. CO3 Describe the architecture in terms of functions performed by different types of operating systems. CO4: Analyze the performance of different algorithms used in design of operating system
27.	MCA 405 Software Lab- VIII (E-Commerce & Web Application Development)	CO1: Understand of implementation of ecommerce applications. CO2: Learn to develop and implement digital marketing strategy and plan

		CO3: Implement and developing effective digital and social media strategies CO4: Implementation and working on the social, and security issues concerning the digital marketing and e-commerce.
28.	MCA 406 Software Lab- IX (Interactive Computer Graphics)	CO1: Understand the structure of modern computer graphics. CO2: Develop and design drawings that demonstrate computer graphics and design skills. CO3: Make use of the key algorithms for modeling and rendering graphical data. CO4: Develop, design and problem solving skills with application to computer graphics. CO5:Creating programs in C++ to implement various graphical features like clipping, filling etc.
29.	MCA 501 Artificial Intelligence	CO1: Understand the significance and domains of Artificial Intelligence and knowledge representation. CO2: Examine the useful search techniques; learn their advantages, disadvantages and comparison. CO3: Develop the skills to gain a basic understanding of neural network theory and fuzzy logic theory. CO4: Apply artificial neural networks and fuzzy logic theory for various problems. CO5: Determine the use of Genetic algorithm to obtain optimized solutions to problems.
30.	MCA 502 Design and analysis of algorithms	CO1: Categorize problems based on their characteristics and practical importance CO2: Develop Algorithms using iterative/recursive approach CO3 : Design algorithm using an appropriate design paradigm for solving a given problem CO4 : Classify problems as P, NP or NP Complete
31.	MCA 503 Web Technologies	CO1:The student should be able to understand, analyze and apply the role of languages like HTML, DHTML, CSS, XML, PHP and protocols in the workings of the web and web applications CO2: The student should be able to analyze a web page and identify its elements and attributes. CO3: The student should be able to create XML documents and XML Schema. CO4: The student should be able to create dynamic web pages using JavaScript and VBScript (client side programming). CO5: The student should be able to build and

		consume web services.
32.	MCA 504 Object Oriented Analysis & Design with UML	CO1:Students should be able to know about object oriented systems and its concepts- classes, objects, abstraction, inheritance etc CO2:Students should learn about Iterative and incremental development approach of software development, the unified process and its phases CO3: Students should be able to know about UML and various concepts and diagrams of UML in detail. CO4:Students should be able to know about various design patterns- GoF and GRASP, their types and also about Antipatterns CO5:Students should get to know about how to map design to code, different CASE tools and also about various testing levels of object- oriented systems CO6: Students should be able to know about aspect oriented and service oriented approach of software development.
33.	MCA 506 Software Lab –XI (Web Technologies	CO1: Students should be able to design dynamic and creative webpages using XHTML. CO2: Students should be able to design webpages using technologies like JavaScript, CSS, HTML, and AJAX. CO3: Students should have clear understanding of hierarchy of objects in HTML and XML. CO4: Students should have knowledge about internet related technologies and Web Services.
34.	MCA 507 Software Lab –XII (Object Oriented analysis and design with UML)	CO1: Students should be able to understand the various concepts of OOAD like inheritance, polymorphism, association etc. CO2: Students should be able to understand class modeling and draw class diagrams. CO3: Students should be able to draw use case diagrams. CO4: Students should be able to identify various business activities and develop the activity diagram. CO5: Students should be able to understand state modeling and draw state diagrams. CO6: Students should be able to draw component diagram and deployment diagram.
35.	MCA 507 Industrial Training	CO1: Students will be able to gain environment experience and at the same time, to gain the knowledge through hands on observation and job execution. CO2:Students will also develop skills in work ethics,

		communication, management and others.
36.	MCA601 Data Warehousing & Mining	CO1: Students should be able to describe basic concepts of data warehousing. CO2: Students should be able to describe basic concepts of spatial data warehouse. CO3: Students should be able to describe basic concepts of temporal data warehouse. CO4: Students should be able to describe various data mining functionalities. CO5: Students should be able to discuss algorithms or techniques for various data mining functionalities.
37.	MCA602 Cloud Computing	CO1: Students will be able to do work on Android OS. CO2: Students will be able to create different type of Android based applications. CO3: Students will be able to discuss various security issues in Android platform. CO4: Students will be able to implement various database applications and content providers. CO5: Students will be able to differentiate among various types of operating systems.
38.	MCA603 Advanced Computer Architecture	CO1: Know about the basic functioning of various parts of computer system from hardware point of view and interfacing of various peripheral devices used with the system. CO2: Learn number system and various types of micro-operations of processor. CO3: Learn the communication of various components through common bus. CO4: Learn how to design Combinational & Sequential circuits
39.	MCA604 Software Testing & Quality Management	CO1: Aware about the engineering approach to analysis, design and built the software CO2: Understand the phases and activities involved in the conventional software life cycle models CO3: Analyze problems, and identify and define the computing requirements appropriate to its solution. CO4: Apply design and development principles in the construction of software systems of varying complexity CO5: Apply current techniques, skills, and tools necessary for computing practice.
40.	MCA605 Software Lab XIII (Software Testing)	CO1: Elicit, analyze and specify software requirements. CO2: Analyze and translate a specification into a

		design CO3: Realize design practically, using an appropriate software engineering methodology. CO4: Plan a software engineering process life cycle. CO5: Use modern engineering tools for specification, design, implementation, and testing
41.	MCA606 Project	CO1: Students will develop plans with relevant people to achieve the project's goals. Break work down into tasks and determine handover procedures. CO2: estimate and cost the human and physical resources required, and make plans to obtain the necessary resources CO3: allocate roles with clear lines of responsibility and accountability.

Department of Bachelor of Computer Applications

Program Outcomes (POs)

1. Basic knowledge: An ability to apply knowledge of basic mathematics, science and domain knowledge to solve the computational problems.
2. Discipline knowledge: An ability to apply discipline –specific knowledge to solve core and/or applied computational problems.
3. Experiments and practice: An ability to plan and perform experiments and practices and to use the results to solve computational problems.
4. Tools Usage: Apply appropriate technologies and tools with an understanding of limitations.
5. Profession and society: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional practice.
6. Environment and sustainability: Understand the impact of the computational solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.
7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the professional practice.
8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.
9. Communication: An ability to communicate effectively.
10. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Program Specific Outcomes

PSO1- Imparted knowledge required for planning, designing and building Complex Application Software Systems

PSO2- Provided support to automated systems or application.

PSO3- Produced entrepreneurs who developed customized solutions for small and medium Enterprises.

Course Outcomes of Bachelor of Computer Applications (2015 Onwards)

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	BSBC 101 Communication-I	CO1: Students should be able to speak in English, in real life situation. CO2: Students should inculcate reading habits and gain effective reading skills. CO3: Students should learn more on active and passive vocabulary. CO4: Students should develop listening skills for academic and professional purpose. CO5: Students should be able to comprehend scientific and technical English. CO6: Students should develop writing skills to prepare CVs, letters and reports in formal and business situations. CO7: Students should be able to analyze and interpret engineering problems expressed in English..
2.	HVPE101 Human Values and Professional Ethics	CO1: To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings. CO2: To facilitate the development of a Holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of Value based living in a natural way. CO3 : To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behavior and mutually enriching interaction with Nature.
3.	BSBC102 Programming in C	CO1: Student should be able to understand the logic building used in Programming. CO2: Students should be able to write algorithms for solving various real life problems. CO3: To convert algorithms into programs using C.
4.	BSBC103 Mathematics-	CO1: Represent data using various mathematical notions. CO2: Explain different terms used in basic mathematics. CO3 : Describe various operations and formulas used to solve mathematical problems
5.	BSBC104 Information Technology	CO1: Familiarizing with Open Office (Word processing, Spreadsheets and Presentation). CO2: To acquire knowledge on editor, spread sheet and

		presentation software. CO3: The students will be able to perform documentation and accounting operations. CO4: Students can learn how to perform presentation skills.
6.	BSBC105 Software Lab-I(Programming in C)	CO1: Students should be able understand the logic building used in programming CO2: Students should be able to write algorithms for solving various real-life problems CO3: Students should be able to convert the algorithms into computer programs using C language.
7.	BSBC106 Software Lab-II(Information - - Technology)	CO1: Familiarizing with Open Office (Word processing, Spreadsheets and Presentation). CO2: To acquire knowledge on editor, spread sheet and presentation software. CO3: The students will be able to perform documentation and accounting operations. CO4 Students can learn how to perform presentation skills.
8.	EVSC101 Environmental Science	CO1: Students will enable to understand environmental problems at local and national Level through literature and general awareness. CO2: The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who have done practical work on Various environmental Issues. CO3: The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to Mitigate these problems. CO4: Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world
9.	BSBC201 Communication-II	CO1: The objective of this course is to introduce students to the theory, fundamentals And tools of communication. CO2: To help the students become the independent users of English language. CO3: To develop in them vital communication skills which are integral to their Personal, social and professional interactions. CO4: The syllabus shall address the issues relating to the Language of communication. CO5:Students will become proficient in professional communication such as interviews, group discussions, office environments, important reading skills as well as

		writing skills such as report writing, note taking etc.
10.	BSBC202 Mathematics-II	CO1: Represent data using various mathematical notions. CO2: Explain different terms used in basic mathematics. CO3 : Describe various operations and formulas used to solve mathematical problems
11.	BSBC203 OOPS Using C++	CO1: To learn programming from real world examples. CO2: To understand Object oriented approach for finding Solutions to various problems with the help of C++ language. CO3: To create computer based solutions to various real-world problems using C++ CO4: To learn various concepts of object oriented approach towards problem solving CO5: To learn programming from real world examples. CO6: To understand Object oriented approach
12.	BSBC204 Computer System Architecture	CO1: Know about the basic functioning of various parts of computer system from hardware point of view and interfacing of various peripheral devices used with the system. CO2: Learn number system and various types of micro-operations of processor. CO3: Learn the communication of various components through common bus. CO4: Learn how to design Combinational & Sequential circuits
13.	BSBC205 Workshop on Web Development	CO1: Implement Static/Dynamic concepts of web designing. CO2: Develop ability to retrieve data from a database and present it in a web page. CO3: Design web pages that apply various dynamic effects on the web site.
14.	BSBC206 Software Lab-III(OOPS Using C++)	CO1: Students should be able to construct programs using classes and objects. CO2 Students should be able to create programs using constructors, destructors and initializer list. CO3: Students should be able to develop operator overloading and type casting programs. CO 4: Students should be able to demonstrate inheritance, polymorphism. CO 5:Students should be able to design Templates and manipulation of files

		CO 6: Students should be able to formulate file handling.
15.	BSBC301 System Analysis & Design	CO1: Understand the principal tasks of software project managers, and basic concepts in Software projects. CO2: Explain the fundamentals of Process Planning, effort estimation and quality planning. CO3: Plan software projects including risk and quality management. CO4: Apply different management and development practices that affect software.
16.	BSBC302 Data Structures	CO1: Describe the usage of various data structures. CO2: Student will be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures. CO3: Student will be able to choose appropriate data structure as applied to specified problem definition. CO4: Recognize the associated algorithms operations and complexity. CO5: Develop computer programs to implement different data structures and related algorithms.
17.	BSBC303 Digital Circuits &Logic Design	CO1: Student will be able to know about the basic functioning of various parts of computer system from hardware point of view and interfacing of various peripheral devices used with the system. CO2: Student will be able to learn number system and various types of micro-operations of processor. CO3: Student will be able to learn the communication of various components through common bus. CO4 : Student will be able to learn how to design Combinational & Sequential circuits
18.	BSBC304 Basic Accounting	CO1: Students will be able to understand basic fundamentals of accounting. CO2: Students will be able to understand to understand basic operations of business transactions CO3: Students will be able to understand basic banking operations. CO4: Students will be able to understand final accounts and importance of accounting in business.
19.	BSBC305 Software Lab-IV (Data Structures)	CO1:Apply appropriate constructs of Programming language, coding standards for application development CO2: Develop programming skills for solving problems. CO3: Apply appropriate searching and/or sorting techniques for application development.
20.	BSBC306 Hardware Lab-I(Digital	CO1: The students will be able to perform number system conversions.

	Circuits &Logic Design)	CO2: The students will understand the function of all components of Computer architecture. CO3: The students will understand various types of basic, combinational & universal logic gates. CO4 : The students will learn how to design Combinational circuits like Adder, Subtractor, Decoder, Encoder, Multiplexer, Demultiplexer CO5: The students will learn how to design Sequential circuits like Flip Flops, Counters
21.	BSBC401 Software Engineering	CO1: The students will be able to aware about the engineering approach to analysis, design and built the software CO2: The students will be able to Understand the phases and activities involved in the conventional software life cycle models CO3: The students will be able to analyze problems, and identify and define the computing requirements appropriate to its solution. CO4: The students will be able to apply design and development principles in the construction of software systems of varying complexity CO5: The students will be able to Apply current techniques, skills, and tools necessary for computing practice.
22.	BSBC402 Microprocessors &Microcontrollers	CO1: The students will be able to recall and apply a basic concept of digital fundamentals to Microprocessor based personal computer system. CO2: The students will be able to identify a detailed s/w & h/w structure of the Microprocessor. CO3: The students will be able to illustrate how the different peripherals (8255, 8253 etc.) Are interfaced with Microprocessor. CO4: The students will be able to distinguish and analyze the properties of Microprocessors & Microcontrollers. CO5: The students will be able to analyze the data transfer information through serial & parallel ports. CO6: The students will be able to train their practical knowledge through laboratory experiments.
23.	BSBC403 Operating Systems	CO1: Discuss the evaluation of operating systems. CO2: Explain different resource managements performed by operating system. CO3: Describe the architecture in terms of functions performed by different types of operating systems. CO4: Analyze the performance of different algorithms used in design of operating system components.

24.	BSBC404 Database Management Systems	CO1: Students will be able to understand the structure of DBMS and how it is organized level by level. CO2: Students will be able to do SQL queries thoroughly to store and retrieve data. CO3: Students will be able to do PL/ SQL programs, cursors, triggers thoroughly. CO4: Students will be able to do normalization to handle different types of anomalies. CO5: Students will be able to handle different DBMS.
25.	BSBC405 Hardware Lab-II(Microprocessors & Microcontrollers)	CO1: Students will be able to know about Introduction to assembly language and its fundamentals. CO2: Students will be able to know about programming Data transfer Instructions. CO3: Students will be able to know programming Arithmetic Instructions, Logical Instructions, shift rotate Instruction & transfer control instructions. CO4: Students will be able to complete the experiments in laboratory and present the technical report. CO5: Students will be able to describe the architecture of microprocessor and its peripheral devices.
26.	BSBC501 Data Warehousing & Mining	CO1: Students should be able to describe basic concepts of data warehousing. CO2: Students should be able to describe basic concepts of spatial data warehouse. CO3: Students should be able to describe basic concepts of temporal data warehouse. CO4: Students should be able to describe various data mining functionalities. CO5: Students should be able to discuss algorithms or techniques for various data mining functionalities.
27.	BSBC502 Programming in Java	CO1: Students will be able to write, compile & execute basic java program CO2: The student will be able to learn the use of data types & variables, decision control structures: if, nested if etc. CO3: The student will be able to use loop control structures: do, while, for and will be able to create classes and objects and use them in their program. CO4: The student will be able create and use threads, handle exceptions and write applets. CO5: The student will be able to learn the use oops concept i.e. data abstraction & data hiding, encapsulation, inheritance, polymorphism.
28.	BSBC503	CO1: The student will be able to solve the problems

	Management Information System	related to the analysis, design & construction of MIS. CO2: The student will be able to demonstrate the knowledge & ability to define the concept & definition of Information systems. CO3: The student will be able to describe the system development stages.
29.	BSBC 504 Workshop on Advanced Web Development	CO1: Getting started with Active Server pages, setting up internet Information server, using ASP without IIS. CO2: Dissecting you first ASP script, writing ASP code without using comments. CO3: Working with variables, constants, arrays, VB script operators &Understanding VB script control structures, Typecasting variables. CO4: Working with Objects, Events & Communicating with user, creating, designing &submitting forms.
30.	BSBC505 Software Lab-VI(Programming in Java)	CO1: The student should be able to implement Core Java concepts. CO2: The student should be able to solve computational problems using various operators of Java. CO3: The student should be able to design solutions to complex by handling exceptions that may occur in the programs. CO4: The student should be able to solve complex and large problems using the concept of multithreading. CO5: The student should be able to implement interfaces and design packages. Implement Core Java concepts.
31.	BSBC506 Project Work-I	CO1: The student should be able to know about various visual basic tools. CO2: The student should be able to know about commands of VB&SQL CO3: The student should be able to know about software development process. CO4: The student should be able to know about able to exhibit both analytical and synthetically skills. CO5: The student should be able to know about able to know the complete project life cycle and the project time estimation & its management
32.	BSBC 601 Principles of Management	CO1: Students should be able to evaluate approaches to addressing issues of diversity. CO2: Integrate management principles into management practices. CO3: Specify how the managerial tasks of planning

		organizing and controlling can be executed in a variety of circumstances. CO4: Assess managerial practices and choices relative ethical principle sand standards. CO5: Determine the most effective action to take in specific situations.
33.	BSBC602 Computer Graphics	CO1: Students will develop programs for lines and circle drawing. CO2: Students will program the hidden surface elimination technique and demonstrate the rotation of the 3d object. CO3: Students will write program functions to implement the different transformations that include rotation, translation, scaling of 2d objects. CO4: Students will be able to construct curves and irregular patterns. CO5: Students will write programs that demonstrate computer graphics animations.
34.	BSBC603 Computer Networks	CO1: Students should be able to understand network models. Students should be able to Understand different network technologies. CO2: Students should be able to Understand the effects of using different networking topologies. CO3: Students should be updated with different advanced network technologies that can be used to connect different networks. CO4: Students should be familiar with various hardware and software that can help protect the network, layers of OSI model and their functionality.
35.	BSBC 604 Information security	CO1: Students should be able to have complete understanding of the security issues surrounding networks. CO2:Students should be able to have detailed and critical understanding of the concepts, issues, principles and theories of computer network security CO3:Students should be able to have detailed and practical understanding of formalisms for specifying security related properties and validating them using model checking CO5:Students should be able to have theoretical and detailed practical knowledge of a range of computer network security technologies as well as network security tools and services CO6: Students should be able to understand and apply the

		concepts for administrating a small company's network. CO7: Students should be able to provide practical experience of analyzing, designing, implementing and validating solutions to computer network security challenges using common network security tools and formal methods.
36.	BSBC605 Software Lab-VII(Computer Graphics)	CO1: Understand the structure of modern computer graphics. CO2: Develop and design drawings that demonstrate computer graphics and design skills. CO3: Make use of the key algorithms for modeling and rendering graphical data. CO4: Develop, design and problem solving skills with application to computer graphics. CO5:Creating programs in C++ to implement various graphical features like clipping, filling etc.
37.	BSBC606 Project Work- 2	CO1: Students will be able to do some innovative work with applying the knowledge gained from various courses undergone in the earlier years. CO2: Students will be able to exhibit both analytical and synthetically skills. CO3: Students will be able to know the complete project life cycle and the project time estimation & its management. CO4: Students will be able to gain knowledge of various simulation tools. CO5: Students will be able to adapt to culture working in a team.

DEPARTMENT OF PHARMACY

Program Outcomes:

Students will have

PO-1: Domain Expertise: Apply comprehensive knowledge and basic principles of Pharmaceutical and other associated sciences.

PO-2: Professional Skills: Demonstrate an ability to identify, formulate and solve complex problems of Pharmaceutical Industry, Community & Hospital Pharmacy.

PO-3: Research Orientation: Approaching Pharmacy with a novel methodology, addressing research through a multidisciplinary lens.

PO-4: Planning Abilities: Demonstrate effective planning, delegation skills, organizational skills and resource management abilities for their effective implementation.

PROGRAMME SPECIFIC OUTCOMES

After the successful completion of the B.Pharmacy programme, the graduates will be able to

PSO – 1: Apply all fundamental principles of core subjects of Pharmaceutical sciences in every aspect of day to day life.

PSO – 2: Use the knowledge of Pharmaceutics and manufacturing concepts for developing formulations.

PSO – 3: Use Community Pharmacy concepts to make an efficient system for society.

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	BP101T Human Anatomy and Physiology-I	CO1. Explain the gross morphology, structure and functions of various organs of the human body. CO2. Describe the various homeostatic mechanisms and their imbalances. CO3. Identify the various tissues and organs of different systems of human body.
2.	BP102T Pharmaceutical Analysis-I	CO1. Understand the principles of volumetric and electro chemical analysis. CO2. Develop analytical skills.
3.	BP103T Pharmaceutics- I	CO1. Know the history of profession of pharmacy. CO2. Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations. CO3. Understand the professional way of handling the prescription.
4.	BP104T Pharmaceutical Inorganic Chemistry	CO1. Know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals. CO2. Understand the medicinal and pharmaceutical importance of inorganic compounds.
5.	BP105T Communication Skills	CO1. Communicate effectively (Verbal and Non Verbal). CO2. Effectively manage the team as a team player. CO3. Develop interview skills.
6.	BP106RBT Remedial Biology	CO1. Know the classification and salient features of five kingdoms of life. CO2. Understand the basic components of anatomy and physiology of plant. CO3. Know understand the basic components of anatomy and physiology animal with special reference to human
7.	BP106RMT Remedial Mathematics	CO1. Know the theory and their application in Pharmacy. CO2. Solve the different types of problems by applying theory. CO3. Appreciate the important application of mathematics in Pharmacy.
8.	BP201T Human Anatomy and Physiology- II	CO1.Perform the hematological tests like blood cell counts, haemoglobin estimation, bleeding/ clotting time etc and also record blood pressure, heart rate, pulse and respiratory volume. CO2. Appreciate coordinated working pattern of

		different organs of each system. CO3. Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body
9.	BP202T Pharmaceutical Organic Chemistry-I	CO1. Write the structure, name and the type of isomerism of the organic compound. CO2. Write the reaction, name the reaction and orientation of reactions. CO3. Account for reactivity/stability of compounds.
10	BP203T Biochemistry	CO1. Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes. CO2. Understand the metabolism of nutrient molecules in physiological and pathological conditions. CO3. Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.
11.	BP204T Pathophysiology	CO1. Describe the etiology and pathogenesis of the selected disease states. CO2. Name the signs and symptoms of the diseases. CO3. Mention the complications of the diseases.
12.	BP205T Computer Applications in Pharmacy	CO1. Know the various types of application of computers in pharmacy. CO2. Know the various types of databases. CO3. Know the various applications of databases in pharmacy.
13.	BP206T Environmental Sciences	CO1. Create the awareness about environmental problems among learners. CO2. Impart basic knowledge about the environment and its allied problems. CO3. Develop an attitude of concern for the environment.
14.	BP301T Pharmaceutical Organic Chemistry –II	CO1.To Write the reaction, name the reaction and orientation of reactions. CO2. Account for reactivity/stability of compounds. CO3. Prepare organic compounds.
15.	BP302T Physical Pharmaceutics-I	CO1. Understand various physicochemical properties of drug molecules in the designing the dosage forms. CO2. Know the principles of chemical kinetics and to use them for stability testing and determination of expiry date of formulations. CO3. Demonstrate use of physicochemical properties in the formulation development and evaluation of

		dosage forms.
16.	BP303T Pharmaceutical Microbiology	CO1. Understand methods of identification, cultivation and preservation of various microorganisms. CO2. To understand the importance and implementation of sterilization in pharmaceutical processing and industry Learn sterility testing of pharmaceutical products. CO3. Carried out microbiological standardization of pharmaceuticals. CO4. Understand the cell culture technology and its applications in pharmaceutical industries.
17.	BP304T Pharmaceutical Engineering	CO1. To know various unit operations used in Pharmaceutical industries. CO2. To understand the material handling techniques. CO3. To perform various processes involved in pharmaceutical manufacturing process. CO4. To carry out various test to prevent environmental pollution
18.	BP401T Pharmaceutical Organic Chemistry – III	CO1. Understand the methods of preparation and properties of organic compounds. CO2. Explain the stereo chemical aspects of organic compounds and stereo chemical reactions. CO3. Know the medicinal uses and other applications of organic compounds
19.	BP402T Medicinal Chemistry – I	CO1. Understand the chemistry of drugs with respect to their pharmacological activity. CO2. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs. CO3. Know the Structural Activity Relationship (SAR) of different class of drugs. CO4. Write the chemical synthesis of some drugs
20.	BP403T Physical Pharmaceutics-II	CO1. Understand various physicochemical properties of drug molecules in the designing the dosage forms CO2. Know the principles of chemical kinetics and to use them for stability testing and determination of expiry date of formulations CO3. Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms
21.	BP404T Pharmacology-I	CO1. Understand the pharmacological actions of different categories of drugs. CO2. Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.

		CO3. Apply the basic pharmacological knowledge in the prevention and treatment of various diseases. CO4. Observe the effect of drugs on animals by simulated experiments. CO5. Appreciate correlation of pharmacology with other bio medical sciences.
22.	BP405T Pharmacognosy And Phytochemistry–I	CO1. To know the techniques in the cultivation and production of crude drugs. CO2. To know the crude drugs, their uses and chemical nature. CO3. Know the evaluation techniques for the herbal drugs. CO4. To carry out the microscopic and morphological evaluation of crude drugs
23.	BP501T Medicinal Chemistry – II	CO1. Understand the chemistry of drugs with respect to their pharmacological activity. CO2. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs. CO3. Study the chemical synthesis of selected drugs.
24.	BP502T Industrial Pharmacy-I	CO1. Know the various pharmaceutical dosage forms and their manufacturing techniques. CO2. Know various considerations in development of pharmaceutical dosage forms. CO3. Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality.
25.	BP503T Pharmacology-II	CO1. Understand the mechanism of drug action and its relevance in the treatment of different diseases. CO2. Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments. CO3. Demonstrate the various receptor actions using isolated tissue preparation
26.	BP504T Pharmacognosy and Phytochemistry-II	CO1.To know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents. CO2. To understand the preparation and development of herbal formulation. CO3. To carryout isolation and identification of phytoconstituents.
27.	BP505T Pharmaceutical Jurisprudence	CO1. The Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals. CO2. Various Indian pharmaceutical Acts and Laws. CO3. The regulatory authorities and agencies

		governing the manufacture and sale of pharmaceuticals. CO4. The code of ethics during the pharmaceutical practice
28.	BP601T Medicinal Chemistry – III	CO1. Understand the importance of drug design and different techniques of drug design. CO2. Understand the chemistry of drugs with respect to their biological activity. CO3. Know the metabolism, adverse effects and therapeutic value of drugs
29.	BP602T Pharmacology –III	CO1. Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases. CO2. Comprehend the principles of toxicology and treatment of various poisonings. CO3. Appreciate correlation of pharmacology with related medical sciences.
30.	BP603T Herbal Drug Technology	CO1. Understand raw material as source of herbal drugs from cultivation to herbal drug product. CO2. Know the WHO and ICH guidelines for evaluation of herbal drugs. CO3. Know the herbal cosmetics, natural sweeteners, and nutraceuticals. CO4. Appreciate patenting of herbal drugs, GMP.
31.	BP604T Biopharmaceutics& Pharmacokinetics	CO1. Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance. CO2. Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism,excretion, elimination. CO3. To understand the concepts of bioavailability and bioequivalence of drug products and their significance.
32.	BP605T Pharmaceutical Biotechnology	CO1. Understanding the importance of Immobilized enzymes in Pharmaceutical Industries. CO2. Genetic engineering applications in relation to production of pharmaceuticals. CO3. Importance of Monoclonal antibodies in Industries.
33.	BP606T Quality Assurance	CO1. Understand the GMP aspects in a pharmaceutical industry. CO2. Appreciate the importance of documentation. CO3. Understand the scope of quality certifications applicable to pharmaceutical industries.

		CO4. Understand the responsibilities of QA & QC departments.
34.	BP701T Instrumental Methods Of Analysis	CO1. Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis. CO2. Understand the chromatographic separation and analysis of drugs. CO3. Perform quantitative & qualitative analysis of drugs using various analytical instruments.
35.	BP702T Industrial Pharmacy-II	CO1. Know the process of pilot plant and scale up of pharmaceutical dosage forms. CO2. Understand the process of technology transfer from lab scale to commercial batch. CO3. Know different Laws and Acts that regulate pharmaceutical industry. CO4. Understand the approval process and regulatory requirements for drug products.
36.	BP703T Pharmacy Practice	CO1. Know various drug distribution methods in a hospital. CO2. Appreciate the pharmacy stores management and inventory control. CO3. Monitor drug therapy of patient through medication chart review and clinical review.
37.	BP704T Novel Drug Delivery Systems	CO1. To understand various approaches for development of novel drug delivery systems. CO2. To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation
38.	BP801T Biostatistics & Research Methodology	CO1. Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment). CO2. Know the various statistical techniques to solve statistical problems. CO3. Appreciate statistical techniques in solving the problems.
39.	BP802T Social & Preventive Pharmacy	CO1. Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide. CO2. Have a critical way of thinking based on current healthcare development. CO3. Evaluate alternative ways of solving problems related to health and pharmaceutical issues.
40.	BP803ET Pharma Marketing Management	CO1. The course aims to provide an understanding of marketing concepts and techniques and their applications in the pharmaceutical industry

41.	BP804ET Pharmaceutical Regulatory Science	CO1. Know about the process of drug discovery and development CO2. Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals CO3. Know the regulatory approval process and their registration in Indian and international Markets
42.	BP805ET Pharmacovigilance	CO1. Why drug safety monitoring is important? CO2. History and development of pharmacovigilance. CO3.National and international scenario of pharmacovigilance. CO4. Dictionaries, coding and terminologies used in pharmacovigilance.
43.	BP806ET Quality Control & Standardization of Herbals	CO1. Know WHO guidelines for quality control of herbal drugs. CO2. Know Quality assurance in herbal drug industry. CO3. Know the regulatory approval process and their registration in Indian and international markets. CO4. Appreciate EU and ICH guidelines for quality control of herbal drugs.
44.	BP807ET Computer Aided Drug Design	CO1. Design and discovery of lead molecules. CO2. The role of drug design in drug discovery process. CO3. The concept of QSAR and docking. CO4. Various strategies to develop new drug like molecules
45.	BP808ET Cell And Molecular Biology	CO1. Summarize cell and molecular biology history. CO2. Summarize cellular functioning and composition. CO3. Describe the chemical foundations of cell biology. CO4. Summarize the DNA properties of cell biology.
46.	BP810ET Experimental Pharmacology	CO1. Appreciate the applications of various commonly used laboratory animals. CO2. Appreciate and demonstrate the various screening methods used in preclinical research. CO3. Appreciate and demonstrate the importance of biostatistics and research methodology. CO4. Design and execute a research hypothesis independently.
47.	BP811ET Advanced Instrumentation	CO1. Understand the advanced instruments used and its applications in drug analysis.

	Techniques	CO2. Understand the chromatographic separation and analysis of drugs. CO3.Understand the calibration of various analytical instruments CO4. Know analysis of drugs using various analytical instruments
48.	BP812ET Dietary Supplements & Nutraceuticals	CO1. Understand the need of supplements by the different group of people to maintain healthy life. CO2. Understand the outcome of deficiencies in dietary supplements. CO3. Appreciate the components in dietary supplements and the application. CO4. Appreciate the regulatory and commercial aspects of dietary supplements including health claims.

DEPARTMENT OF MLS

PROGRAM OUTCOMES:

Students will have

1. Possess an ability to apply knowledge of Hematology, Histopathology, Microbiology, Clinical Biochemistry.
2. Possess an ability to design and conduct experiments, as well as to analyze and interpret data.
3. Possess an ability to function on multidisciplinary teams
4. Possess an understanding professional and ethical responsibility.
5. Possess an ability to communicate effectively
6. Possess a capability to understand impact of Medical Laboratory solutions in a global, economic, environmental, and societal context.
7. Possess an ability to recognize the need for, and an ability to engage in life-long learning.

PROGRAMME SPECIFIC OUTCOMES

After the successful completion of the B.SC programme in Medical Laboratory Sciences, the graduates will be able to:

PSO – 1: Apply all fundamental principles of core subjects of Medical Sciences in every aspect of day to day life.

PSO – 2: Use the histopathology to diagnose different diseases.

PSO – 3: Use Clinical Biochemistry biomarkers to detect different types of diseases.

COURSE OUTCOMES

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	BMLS101-18 Essential Biology	CO1. To train the students in understanding basic of cell, biomolecules and about genetics. CO2. Understand the basic components of anatomy and physiology of human body.
2.	BMLS102-18 General Microbiology	CO1. This subject gives the general insight into history and basics of medical microbiology, imparts the knowledge about equipment used in Medical Microbiology and basic procedures done in medical microbiology laboratory i.e. microscopy, sterilization, disinfection, culture methods required to perform different microbiological tests in clinical microbiology lab and biomedical waste management.
3.	BMLS103-18 Basics of Biochemistry	CO1. Understand the catalytic role of enzymes, importance of enzyme inhibitors in design ofnew drugs, therapeutic and diagnostic applications of enzymes. CO2. Imparts knowledge of apparatus, units, equipments, volumetric analysis in the laboratory of biochemistry
4.	BTHU103-18 English	CO1. The objective of this course is to introduce students to the theory, fundamentals and tools of communication. CO2. To help the students become the independent users of English language.
5.	HVPE101-18 Human Values, De-addiction and Traffic Rules	CO1. To help the students appreciate the essential complementarily between values and skills to ensure sustained happiness and prosperity which are the core aspirations of all human beings. CO2. To facilitate the development of a Holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of Value based living in a natural way.
6.	BMLS201-18 Systemic Bacteriology	CO1. This subject will give information about the different types of bacterial culture procedures, staining procedures and Biochemical tests used for identification of bacteria. CO2. The students will learn the morphology cultural characteristics, biochemical characteristics & laboratory diagnosis of various bacteria.
7.	BMLS202-18	CO1. This subject shall give information about all the

	Biochemical Metabolism	major metabolic pathways occurring in our body. CO2. The students will learn the details about metabolism of carbohydrates, proteins, lipids, nucleic acids, enzymes & the deficiency diseases related to them
8.	BMLS203-18 Human Anatomy and Physiology-I	CO1. Students will be able to learn the terminology of the subject and basic knowledge of cells, tissues, blood and to understand anatomy and physiology of human body. CO2. This subject will develop an understanding of the structure and function of organs and organ systems in normal human body.
9.	EVS102-18 Environment Studies	CO1. Create the awareness about environmental problems among learners. CO2. Impart basic knowledge about the environment and its allied problems
10.	BMLS301-18 Basic Hematological&Hematological Techniques-I	CO1. The students will be made aware of the composition of blood and methods of estimating different components of blood. CO2. Students will be able to know the basic concepts of Haematology & routine clinical investigations of Haematology laboratory
11.	BMLS302-18 Analytical Biochemistry	CO1. The students will learn basic principle/ mechanisms, procedures and types of various techniques commonly performed in analytical biochemistry.
12.	BMLS303-18 Human Anatomy & Physiology - II	CO1. Students will be able to learn the terminology of the subject and basic knowledge of cells the structure and function of organs and organ systems and body fluids in normal human body
13.	BMLS307-18 Applied Bacteriology	CO1. The part will cover the strategy in the Laboratory diagnosis of various Infective syndromes i. e. choice of samples, collection and transportation and processing of samples for isolation of bacterial pathogen and then to put antibiotic susceptibility testing. CO2. This will also cover Bacteriological examination of water, milk, food and air and nosocomial infections.
14.	BMLS401-18 Basic Cellular Pathology	CO1. Describe the etiology and pathogenesis of the selected disease states. CO2. Diseases associated with different body organs and systems.
15.	BMLS402-18 Basic Haematological	CO1. The students will learn about normal and abnormal haemoglobin and different aspects of

	Techniques – II	Normal haemostatic mechanism and theories of blood coagulation. CO2. They will also learn the estimation of different parameters of coagulation studies.
16.	BMLS403-18 Clinical Biochemistry – I	CO1. Hazards & safety measures in clinical Biochemistry laboratory. CO2. Quality control and quality assurance in a clinical biochemistry laboratory
17.	BMLS407-18 Immunology and Mycology	CO1.Basic aspects of immunity, antigens, antibodies, various serological reactions, techniques and their utility in laboratory diagnosis of human diseases. CO2. It will also cover medically important fungi, infections caused by them and their laboratory diagnosis.
18.	BMLS501-18 Applied Haematology-I	CO1. The students be made aware of Safety precautions, Quality assurance, biomedical waste management and automation in haematology. CO2. It will also cover Bone marrow examination, Red cell anomalies, Disorder of leucocytes, L.E. cell phenomenon, Investigations of a case suffering from bleeding disorders, routine examination of urine, seminal fluid and CSF.
19.	BMLS503-18 Medical Laboratory Management	CO1. The students will become aware of ethics in a clinical laboratory, Good laboratory practice and Quality Management in a clinical laboratory.
20.	BMLS504-18 Histotechnology -I	CO1. Students will be made aware of terminology used in histotechnology, various instruments and their maintenance and also learn the processing of various samples for histopathological investigations
21.	BMLS505-18 Clinical Biochemistry--II	CO1. The students will learn about the various methods of patients sample analysis for biochemistry parameters. CO2. The students will learn how to analyze various clinical samples, for estimation of different components which are the cause of the disease or are the diagnostic/prognostic markers. This subject gives information about various clinically important enzymes & automation techniques
22.	BMLS601-18 Applied Haematology – II	CO1. Imparts knowledge about Causes, Diagnosis and treatment of various blood diseases. CO2. Also acknowledge about production of blood and its components.

23.	BMLS603-18 Blood Banking	CO1. This subject will make students learn about blood grouping & blood transfusion. CO2. Give knowledge about concept of blood grouping, compatibility testing in blood transfusion & screening of donated blood for various infectious diseases.
24.	BMLS606-18 Parasitology and Virology	CO1. Gives introduction, general characteristics, life cycle and laboratory diagnosis of various Medically important parasites. CO2. Knowledge about diseases caused by medically important viruses, samples collection and laboratory diagnosis of some important viral infections.
25.	BMLS605-18 Histotechnology – II & Cytology	CO1. Tells about various staining procedures for demonstration of different substances & various cytological investigations. CO2.Learn about museum techniques and neuropathological techniques.

Department of Agriculture

Program Outcomes

Students will have

- An ability to apply knowledge of crop science, developing new varieties.
- An ability to apply plant protection measures to control the disease and pest in crops.
- An ability to develop skills for increasing crop productivity.
- An ability to design innovations in developing sustainable Agriculture. To develop alternate Agriculture technology to save underground water and preserve the Environment.

Programme Specific Outcomes (PSOs)

- Real world application: To comprehend, analyze, design and develop innovative products and provide solutions for the real-life problems.
- Multi-disciplinary areas: To work collaboratively on multi-disciplinary areas and make quality projects. Research oriented innovative ideas and methods: To adopt modern techniques, advanced Agro meteorological methods, scientific and organic fundamentals required to solve industrial and societal problems.

Course Outcomes of Agriculture Department

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	BSAG-101-19 Fundamentals of Horticulture (Theory)	CO1. Comprehend the fundamentals of horticulture in terms of its value CO2. Propagate horticultural plants and trees CO3. Design orchards and landscapes for architectural firms CO4. Decide on the crops, fertilizers and irrigation measures to be followed by farmers CO5. Develop career interest in the field of horticulture
2.	BSAG-102-19 Fundamentals of Soil Science (Theory)	CO1. Acquire knowledge on the importance of soil to agriculture CO2. Value the physical properties of soil CO3. Classify soil type, soil texture and soil structure required for an agricultural field CO4. Analyze soil, water and nutrients related to crop growth CO5. State techniques to mitigate soil pollution CO6. Identify soil related problems in agricultural fields and provide suitable solutions
3.	BSAG-103-19 Introduction to Forestry (Theory)	CO1. Recognize the importance of forestry CO2. Explain and appreciate the techniques involved in forest regeneration CO3. Describe mensuration techniques to quantify forests data CO4. Plan to regenerate a forest CO5. Prepare an agroforestry system to support human sustenance
4.	BSAG-104-19 Comprehension and Communication Skills in English (Theory)	CO1. Analyze grammatical errors CO2. Identify correct pronunciation CO3. Express writing skills CO4. Comprehend the course materials of all courses and improve oral communication skills CO5. Demonstrate presentation skills

5.	BSAG-105-19 Fundamentals of Agronomy (Theory)	CO1. Express knowledge gained on the principles of agronomy CO2. Recognize the various nutrients and their effects on plant health CO3. Plan irrigation measures for plant growth and development CO4. Manage weeds in a field CO5. Plan for sustainable agricultural production CO6. Apply scientific methods and tools in field preparation and for designing cropping
6.	BSAG-106-19(A) Introductory, Biology (Theory)	CO1. Compare living organisms CO2. Classify and name living beings CO3. Describe cell and its division CO4. Interpret flowering plants and state the role of animals in agriculture CO5. Illustrate theory of life CO6. Describe plant organs and gain interest in learning biological sciences
7.	BSAG-106-19(B) Elementary Mathematics	CO1. Device formulas for straight lines CO2. Comprehend the use of Slope-Intercept CO3. Apply the knowledge gained in designing fields CO4. Acquire interest to utilize calculus in agriculture CO5. Integrate product of functions and define matrices and determinants CO6. Link mathematics with agricultural engineering
8.	BSAG-107-19 Agricultural Heritage	CO1. Appreciate agriculture practiced throughout the world CO2. Understand the rich agricultural heritage of India CO3. Integrate judicious traditional agricultural practices with modern methods CO4. Plan on using agricultural resources CO5. Comprehend agricultural issues
9.	BSAG-108-19 Rural Sociology & Educational Psychology	CO1. Classify rural social groups of India CO2. Describe social values CO3. Plan social change using agricultural based development programs CO4. Assess farmers based on personality determinants CO5. Plan to bring in a behavioural change CO6. Bring in new extension activities suitable for the society

10.	BSAG-109-19 Human Value and Ethics	CO1. The students identify the importance of human values and skills for sustained happiness. CO2. The students strike a balance between profession and personal happiness/ goals. CO3. The students realize/ explain the significance of trust, mutually satisfying human behavior and enriching interaction with nature. CO.The students develop/ propose appropriate technologies and management patterns to create harmony in professional and personal life.
11.	BSAG-110-19 Fundamentals of Horticulture (Practical)	CO1. Comprehend the fundamentals of horticulture in terms of its value CO2. Propagate horticultural plants and trees CO3. Design orchards and landscapes for architectural firms CO4. Decide on the crops, fertilizers and irrigation measures to be followed by farmers CO5. Develop career interest in the field of horticulture
12.	BSAG-111-19 Fundamentals of Soil Science (Practical)	CO1. Acquire knowledge on the importance of soil to agriculture CO2. Value the physical properties of soil CO3. Classify soil type, soil texture and soil structure required for an agricultural field CO4. Analyze soil, water and nutrients related to crop growth CO5. State techniques to mitigate soil pollution CO6. Identify soil related problems in agricultural fields and provide suitable solutions
13.	BSAG-112-19 Introduction to Forestry(Practical)	CO1. Recognize the importance of forestry CO2. Explain and appreciate the techniques involved in forest regeneration CO3. Describe mensuration techniques to quantify forests data CO4. Plan to regenerate a forest CO5. Prepare an agroforestry system to support human sustenance
14.	BSAG-113-19 Comprehension and Communication Skills in English (Practical)	CO1. Analyze grammatical errors CO2. Identify correct pronunciation CO3. Express writing skills CO4. Comprehend the course materials of all courses and improve oral communication skills CO5. Demonstrate presentation skills

		CO6. Illustrate communication skills
15.	BSAG-114-19 Fundamentals of Agronomy (Practical)	CO1. Express knowledge gained on the principles of agronomy CO2. Recognize the various nutrients and their effects on plant health CO3. Plan irrigation measures for plant growth and development CO4. Manage weeds in a field CO5. Plan for sustainable agricultural production CO6. Apply scientific methods and tools in field preparation and for designing cropping
16.	BSAG-115-19 Introductory Biology(Practical)	CO1. Compare living organisms CO2. Classify and name living beings CO3. Describe cell and its division CO4. Interpret flowering plants and state the role of animals in agriculture CO5. Illustrate theory of life CO6. Describe plant organs and gain interest in learning biological sciences
17.	BSAG-116-19 NSS / NCC / Physical Education and Yoga	CO1. Infer physical and mental discipline CO2. Practice the gained skills to stay physically fit CO3. Develop stamina and improve health and hygiene CO4. Improve inter personal skills and work well in a group CO5. Develop self-confidence CO6. Plan in achieving goals
18.	BSAG201- Fundamentals of Genetics ((Theory)	CO1. Apply the knowledge gained on inheritance and variation CO2. Develop problem-solving skills pertaining to inheritance CO3. Relate mutation to evolution and heredity CO4. Interpret the functions of genetic material. CO5. Solve and analyze problems in basic genetics
19.	BSAG202-19 Agricultural Microbiology (Theory)	CO1. Discriminate prokaryotic and eukaryotic microbes CO2. Delineate the structure and growth of bacteria CO3. Utilize microbes as models to study genetics CO4. Use microbes in enriching specific plant nutrients CO5. Analyze the ubiquitous nature of microbes inhabiting a wide range of ecological habitats CO6. Practice bacterial isolation
20.	BSAG203-19 Soil and Water Conservation	CO1. Apply different surveying methods to measure area in agricultural field CO2. Determine soil loss for a specific area based on

	Engineering (Theory)	erosivity and erodibility factor CO3. Relate different techniques to control wind erosion CO4. Apply rain water harvesting methods to conserve water CO5. Interpret case studies related to soil and water conservation CO6. Design irrigation systems and plan erosion control measures
21.	BSAG204-19 (Theory)	CO1. Define different physiological process at plant and cellular level CO2. Summarize mechanisms of uptake, transport and translocation of water and nutrients CO3. Distinguish carbon cycles in plants and define lipid metabolism CO4. Relate the importance of growth regulators in plant growth CO5. Explain nutrient deficiencies and physiological requirements of plants CO6. Interpret and measure plant physiological data
22.	BSAG205-19 Fundamentals of Agricultural Economics (Theory)	CO1. Apply the knowledge gained on the fundamentals of economics CO2. Employ agricultural economic applications CO3. Practice applying mathematical models to agro-economics CO4. Interpret market structures responsible for creating national income CO5. Analyze agro economic growth and develop policies CO6. Integrate agro-economic knowledge with real time application
23.	BSAG206-19 Fundamentals of Plant Pathology (Theory)	CO1. Recognize the importance and scope of plant pathology and analyze the causes and factors leading to pathogenesis CO2. Classify pathogens taxonomically for designing effective disease management strategies CO3. Differentiate plant pathogens based on morphology, vegetative, reproductive and resting structures. CO4. Relate disease cycles, physiology of pathogens and plant defense

		CO5. Describe epidemiology of plant diseases and strategies for disease management CO6. Practice identifying and controlling pathogens
24.	BSAG-207-19 Fundamentals of Entomology (Theory)	CO1.Express knowledge gained on the historic contributions of eminent scientists in the field of entomology and fascinating facts about insects CO2. Describe insect's anatomy and morphology CO3. Infer biochemical and physiological processes governing insect metabolism, growth, and form CO4. Relate ecological relationships of insects with other life forms CO5. Devise pest control measures CO6. Identify insects based on their key taxonomic character
25.	BSAG-208-19 Fundamentals of Agricultural Extension Education (Theory)	CO1. Realize the necessity of agricultural extension for rural development CO2. Acquire knowledge on extension systems in India CO3. Devise plans for rural community development; plan and evaluate an extension programme CO4. Transfer technology and innovations towards agricultural development CO5. Develop interest in agricultural journalism CO6. Disseminate information and technology through audio visual aids
26.	BSAG-209-19 Communication Skills and Personality Development (Theory)	CO1. Analyze grammatical errors CO2. Identify correct pronunciation CO3. Express writing skills CO4. Comprehend the course materials of all courses and improve oral communication skills CO5. Demonstrate presentation skills CO6. Illustrate communication skills
27.	BSAG210-19 Fundamental of Genetics (Practical)	CO1. Apply the knowledge gained on inheritance and variation CO2. Develop problem-solving skills pertaining to inheritance CO3. Relate mutation to evolution and heredity CO4. Interpret the functions of genetic material. CO5. Solve and analyze problems in basic genetics
28.	BSAG211-19 Agriculture Microbiology (Practical)	CO1. Discriminate prokaryotic and eukaryotic microbes CO2. Delineate the structure and growth of bacteria CO3. Utilize microbes as models to study genetics CO4. Use microbes in enriching specific plant nutrients CO5. Analyze the ubiquitous nature of microbes

		inhabiting a wide range of ecological habitats CO6. Practice bacterial isolation
29.	BSAG212-19 Soil and Water Conservation Engineering (Practical)	CO1. Apply different surveying methods to measure area in agricultural field CO2. Determine soil loss for a specific area based on erosivity and erodibility factor CO3. Relate different techniques to control wind erosion CO4. Apply rain water harvesting methods to conserve water CO5. Interpret case studies related to soil and water conservation CO6. Design irrigation systems and plan erosion control measures
30.	BSAG213-19 Fundamentals of Crop Physiology (Practical)	CO1. Define different physiological process at plant and cellular level CO2. Summarize mechanisms of uptake, transport and translocation of water and nutrients CO3. Distinguish carbon cycles in plants and define lipid metabolism CO4. Relate the importance of growth regulators in plant growth CO5. Explain nutrient deficiencies and physiological requirements of plants CO6. Interpret and measure plant physiological data
31.	BSAG214-19 Fundamentals of Plant Pathology	CO1. Recognize the importance and scope of plant pathology and analyze the causes and factors leading to pathogenesis CO2. Classify pathogens taxonomically for designing effective disease management strategies CO3. Differentiate plant pathogens based on morphology, vegetative, reproductive and resting structures. CO4. Relate disease cycles, physiology of pathogens and plant defense CO5. Describe epidemiology of plant diseases and strategies for disease management CO6. Practice identifying and controlling pathogens
32.	BSAG215-19 Fundamentals of Entomology (Practical)	CO1.Express knowledge gained on the historic contributions of eminent scientists in the field of entomology and fascinating facts about insects CO2. Describe insect's anatomy and morphology CO3. Infer biochemical and physiological processes governing insect metabolism, growth, and form

		CO4. Relate ecological relationships of insects with other life forms CO5. Devise pest control
33.	BSAG216-19 Fundamentals of Agricultural Extension Education (Practical)	CO1. Realize the necessity of agricultural extension for rural development CO2. Acquire knowledge on extension systems in India CO3. Devise plans for rural community development; plan and evaluate an extension programme CO4. Transfer technology and innovations towards agricultural development CO5. Develop interest in agricultural journalism CO6. Disseminate information and technology through audio visual aids
34.	BSAG217-19 Communication Skills and Personality Development (Practical)	CO1. Analyze grammatical errors CO2. Identify correct pronunciation CO3. Express writing skills CO4. Comprehend the course materials of all courses and improve oral communication skills CO5. Demonstrate presentation skills CO6. Illustrate communication skills
35.	BSAG-301-19 Crop Production Technology – I (Kharif Crops)	CO1. Comprehend the fundamentals of crop production of cereals CO2. Decide on the crops, fertilizers and irrigation measures for production of pulses CO3. Plan for sustainable crop production of oilseeds CO4. Explain the techniques involved in crop production of fibre and forage crops CO5. Correlate parameters involved in crop cultivation and practice kharif crop cultivation
36.	BSAG-302-19 Fundamentals of Plant Breeding	CO1. Understand how humans have flourished due to breeding and domestication of plants CO2. Correlate the genetics behind breeding of crops CO3. Comprehend breeding of crops CO4. Exploit crops to express hybrid vigour CO5. Realize the necessity of protecting farmers and breeders rights CO6. Practice hybridisation and plan breeding experiments
37.	BSAG-303-19	

	Agricultural Finance and Cooperation	CO1. Explain on agricultural finance and credit. CO2. Comprehend the role of sources involved in farm financing
38.	BSAG-304-19 Agri-Informatics	CO1. Able to utilize operating systems like MS office and DBMS in agriculture CO2. Comprehend programming languages CO3. Use the internet for obtaining useful information regarding agriculture CO4. Retrieve and generate information using geospatial technology CO5. Relate contemporary ideas CO6. Compute, create, operate and translate data using operating systems and IT tools
39.	BSAG-305-19 Farm Machinery and Power	CO1. Identify and differentiate two stroke and four stroke I.C engines CO2. Distinguish different components and systems of IC engines CO3. Compare different tillage implements used for various agricultural purposes CO4. Classify various farm implements and comprehend its calibration methods CO5. Estimate the cost benefit economics of various farm implements CO6. Experiment with different equipment used in agricultural fields from planting to harvesting
40.	BSAG-306-19 Production Technology for Vegetables and Spices	CO1. Appreciate the importance of cultivating vegetables and spices CO2. Demonstrate ideas on cultivating vegetables and spices CO3. Understand the physiological disorders undermining the yield of vegetables and spices CO4. Plan for commercial cultivation of vegetables and spices CO5. Cultivate and demonstrate marketing of vegetables
41.	BSAG-307-19 Environmental Studies and Disaster Management	CO1. Summarize natural sources and state the need for conserving the resources CO2. Understand the functions of ecosystems CO3. Comprehend the importance of conserving species on earth

		CO4. Delineate manmade disasters and plan towards sustainable development CO5. Demonstrate knowledge acquired in natural disaster management CO6. Assess disaster issues based on knowledge gained and field work and design remedies
42.	BSAG-308-19 Statistical Methods	CO1. Present and analyze scientific data CO2. Solve problems on probability CO3. Interpret statistical test outcomes CO4. DesiCgn and analyze experiments CO5. Appreciate the applications of statistical methods in science and engineering CO6. Apply relevant statistical analysis to experimental data
43.	BSAG-309-19 Livestock and Poultry Management	CO1. Understand the importance of livestock in human welfare CO2. Demonstrate knowledge on housing requirements for poultry and livestock CO3. Handle the different life stages of livestock and select best breeds for growing CO4. Design and ration feedstuffs for livestock CO5. Mange and prevent the occurrence of livestock diseases CO6. Rear livestock
44.	BSAG-310-19 Crop Production Technology – I (Kharif Crops) (Practical)	CO1. Comprehend the fundamentals of crop production of cereals CO2. Decide on the crops, fertilizers and irrigation measures for production of pulses CO3. Plan for sustainable crop production of oilseeds CO4. Explain the techniques involved in crop production of fibre and forage crops CO5. Correlate parameters involved in crop cultivation and practice kharif crop cultivation
45.	BSAG-311-19 Fundamentals of Plant Breeding (Practical)	CO1. Understand how humans have flourished due to breeding and domestication of plants CO2. Correlate the genetics behind breeding of crops CO3. Comprehend breeding of crops CO4. Exploit crops to express hybrid vigour CO5. Realize the necessity of protecting farmers and breeders rights

		CO6. Practice hybridisation and plan breeding experiments
46.	BSAG-312-19 Agricultural Finance and Cooperation (Practical)	CO1. Explain on agricultural finance and credit. CO2. Comprehend the role of sources involved in farm financing.
47.	BSAG-313-19 Agri- Informatics(Practical)	CO1. Able to utilize operating systems like MS office and DBMS in agriculture CO2. Comprehend programming languages CO3. Use the internet for obtaining useful information regarding agriculture CO4. Retrieve and generate information using geospatial technology CO5. Relate contemporary ideas CO6. Compute, create, operate and translate data using operating systems and IT tools
48.	BSAG-314-19 Farm Machinery and Power (Practical)	CO1. Identify and differentiate two stroke and four stroke I.C engines CO2. Distinguish different components and systems of IC engines CO3. Compare different tillage implements used for various agricultural purposes CO4. Classify various farm implements and comprehend its calibration methods CO5. Estimate the cost benefit economics of various farm implements CO6. Experiment with different equipment used in agricultural fields from planting to harvesting
49.	BSAG-315-19 Production Technology for Vegetables and Spices (Practical)	CO1. Appreciate the importance of cultivating vegetables and spices CO2. Demonstrate ideas on cultivating vegetables and spices CO3. Understand the physiological disorders undermining the yield of vegetables and spices CO4. Plan for commercial cultivation of vegetables and spices CO5. Cultivate and demonstrate marketing of vegetables

50.	BSAG-316-19 Environmental Studies and Disaster Management (Practical)	CO1. Summarize natural sources and state the need for conserving the resources CO2. Understand the functions of ecosystems CO3. Comprehend the importance of conserving species on earth CO4. Delineate manmade disasters and plan towards sustainable development CO5. Demonstrate knowledge acquired in natural disaster management CO6. Assess disaster issues based on knowledge gained and field work and design remedies
51.	BSAG-317-19 Statistical Methods(Practical)	CO1. Present and analyze scientific data CO2. Solve problems on probability CO3. Interpret statistical test outcomes CO4. Design and analyze experiments CO5. Appreciate the applications of statistical methods in science and engineering CO6. Apply relevant statistical analysis to experimental data
52.	BSAG-318-19 Livestock and Poultry Management (Practical)	CO1. Understand the importance of livestock in human welfare CO2. Demonstrate knowledge on housing requirements for poultry and livestock CO3. Handle the different life stages of livestock and select best breeds for growing CO4. Design and ration feedstuffs for livestock CO5. Mange and prevent the occurrence of livestock diseases CO6. Rear livestock
53.	BSAG-401: Crop Production Technology –II (Rabi Crops)	CO1.Comprehend the fundamentals of crop production of cereals CO2. Decide on the crops, fertilizers and irrigation measures for production of pulses CO3. Plan for sustainable crop production of oilseeds CO4.Explain the techniques involved in crop production of fibre and forage crops CO5.Correlate parameters involved in crop cultivationand practice kharif crop cultivation
54.	BSAG- 402: Production technology for ornamental crops, MAP and Landscaping	CO1.Appreciate the importance of landscaping and growing of medicinal and aromatic plants. CO2.Understand the requirements for land scaping. CO3. Plan and practice propagation of cut flowers.

		CO4.Explain the values of cultivating medicinal plants. CO5.Design landscapes and practice cultivation of medicinal and aromatic plants.
55.	BSAG-403: Renewable Energy and Green Technology	CO1.Summarize the importance of renewable energy and its sources CO2.Compare different biogas plants, its benefits, advantages and cost analysis CO3.Discuss the importance of solar energy and their applications. CO4.Explain the need of wind energy and energy components involved and their applications CO5.Interpret merits and demerits of various renewable sources of energy CO6.Design simple projects based on renewable energy systems
56.	BSAG-404: Problematic Soils and their Management	CO1.Comprehend the scenario of waste land and problem soils in India CO2.Understand reclamation of problematic soils CO3.Acquire knowledge on water quality State the role of remote sensing and GIS in diagnosis of problematic soils CO4.Understand the remediation of soils under different agro-ecosystems CO5.Explain management of problematic soils
57.	BSAG-405: Production technology of fruits and Plantation crop.	CO1.Analyze the scope of cultivating a fruit or plantation crop CO2. Define package of practices followed for tropical fruits CO3.Comprehend technology involved in growing sub-tropical fruits CO4. Define package of practices followed for minor fruits and plantation crops CO5.Design an orchard CO6.Develop one's career interest in pomiculture and plantation crops
58.	BSAG-406: Principles of seed technology	CO1. Comprehend seed production and seed quality CO2.Demonstrate the concepts of seed certification, Seed Act and seed testing processes CO3.Understand seed processing and seed storage techniques CO4. State the norms of seed marketing in India. CO5.Apply practical knowledge gained to commercially

		produce seeds and practice seed testing
59.	BSAG-407: Farming System and sustainable agriculture	CO1.Comprehend seed production and seed quality CO2.Demonstrate the concepts of seed certification, Seed Act and seed testing processes CO3.Understand seed processing and seed storage techniques CO4.State the norms of seed marketing in India. CO5.Apply practical knowledge gained to commercially produce seeds and practice seed testing
60	BSAG- 408: Agricultural marketing rate and prices	CO1.Explain the importance of agricultural marketing CO2.Comprehend marketing strategies of agricultural products CO3.Understand efficient marketing and the role of government and public sectors in marketing CO4.Interpret agricultural commodity prices and policies CO5.Discuss trade at national and international level Device plans for agricultural product marketing
61.	BSAG-409: Introductory Agrometeorology and climate change	CO1.Appreciate the importance of weather variables in agriculture CO2.Comprehend the role solar radiation in crop growth CO3.Analyze various forms of precipitation CO4.Interpret the role of weather hazards and climate change in crop growth CO5.Understand the correlation between weather and agriculture
62.	BSAG-410: Crop Production Technology –II (Rabi Crops) Practical)	CO1.Comprehend the fundamentals of crop production of cereals CO2.Decide on the crops, fertilizers and irrigation measures for production of pulses CO3.Plan for sustainable crop production of oilseeds CO4.Explain the techniques involved in crop production of fibre and forage crops CO5.Correlate parameters involved in crop cultivation and practice kharif crop cultivation
63.	BSAG- 411: Production technology for ornamental crops, MAP and Landscaping (Practical)	CO1.Appreciate the importance of landscaping and growing of medicinal and aromatic plants. CO2.Understand the requirements for land scaping. CO3.Plan and practice propagation of cut flowers. CO4.Explain the values of cultivating medicinal plants. CO5.Design landscapes and practice cultivation of

		medicinal and aromatic plants.
64.	BSAG-412: Renewable Energy and Green Technology (Practical)	CO1.Summarize the importance of renewable energy and its sources CO2.Compare different biogas plants, its benefits, advantages and cost analysis CO3.Discuss the importance of solar energy and their applications. CO4.Explain the need of wind energy and energy components involved and their applications CO5.Interpret merits and demerits of various renewable sources of energy CO6.Design simple projects based on renewable energy systems
65.	BSAG-413: Production technology of fruits and Plantation crop. (Practical)	CO1.Analyze the scope of cultivating a fruit or plantation crop CO2.Define package of practices followed for tropical fruits CO3.Comprehend technology involved in growing sub-tropical fruits CO4.Define package of practices followed for minor fruits and palntaion of crops CO5.Design an orchard CO6.Develop one's career interest in pomiculture and plantation crops
66	BSAG-414: Principles of seed technology (Practical)	CO1.Comprehend seed production and seed quality CO2.Demonstrate the concepts of seed certification, Seed Act and seed testing processes CO3.Understand seed processing and seed storage techniques CO4.State the norms of seed marketing in India. CO5.Apply practical knowledge gained to commercially produce seeds and practice seed testing
67	BSAG-415: Agricultural marketing rate and prices (Practical)	CO1.Appreciate the importance of weather variables in agriculture CO2.Comprehend the role solar radiation in crop growth CO3.Analyze various forms of precipitation CO4.Interpret the role of weather hazards and climate change in crop growth CO5.Understand the correlation between weather and agriculture

68	BSAG-416: Introductory Agrometerology and climate change (Practical)	CO1.Appreciate the importance of weather variables in agriculture CO2.Comprehend the role solar radiation in crop growth CO3.Analyze various forms of precipitation CO4.nterpret the role of weather hazards and climate change in crop growth CO5.Understand the correlation between weather and agriculture CO6.Measure weather parameters essential for crop growth
69	BSAG-417: Protected cultivation	CO1.Understand the importance of protected cultivation CO2.Design and manage greenhouses for protected cultivation CO3.Manage soil, nutrients and irrigation systems under protected cultivation CO4.Gain knowledge on cultivation and propagation of plants in a greenhouse CO5.Plan, manage and propagate crops under protected cultivation for commercial purposes
70	BSAG-418: Protected cultivation (Practical)	CO1.Understand the importance of protected cultivation CO2.Design and manage greenhouses for protected cultivation CO3.Manage soil, nutrients and irrigation systems under protected cultivation CO4.Gain knowledge on cultivation and propagation of plants in a greenhouse CO5.Plan, manage and propagate crops under protected cultivation for commercial purposes
71	BSAG-419: Commercial plant breeding	CO1.Understand the concepts of producing a male sterile, maintainer and restorer line. CO2.Define hybrid seed production techniques across field crops CO3.Choose plant biotechnological tools and IPR to promote crop improvement CO4.State the norms involved in crop variety release and seed production CO5.Practice hybridization and plant breeding
72	BSAG-420: Commercial plant breeding (Practical)	CO1.Understand the concepts of producing a male sterile, maintainer and restorer line. CO2.Define hybrid seed production techniques across field crops

		CO3.Choose plant biotechnological tools and IPR to promote crop improvement CO4.State the norms involved in crop variety release and seed production CO5.Practice hybridization and plant breeding
73	BSAG- 421: Agrochemicals	CO1.Infer the importance of agrochemicals for sustainable agriculture CO2.Acquire knowledge on herbicides and fungicides CO3.Classify and know the role of insecticides CO4.Analyze fertilizers application related to crop growth
74	BSAG- 422: Agrochemicals (Practical)	CO1.Infer the importance of agrochemicals for sustainable agriculture CO2.Acquire knowledge on herbicides and fungicides CO3.Classify and know the role of insecticides CO4.Analyze fertilizers application related to crop growth
75	BSAG-423: Agri -Business Management	CO1.Acquire knowledge on transforming agriculture into agribusiness. CO2.Comprehend the procedures of setting up of agro-based industries CO3.Analyse the various activities and linkages in agri-value chain and the business environment CO4.Assess the capital, financial and marketing management of agribusiness CO5.Develop skills in project formulation, appraisal and evaluation CO6.Do agribusiness
76	BSAG-424: Agri- Business Management (Practical)	CO1.Acquire knowledge on transforming agriculture into agribusiness. CO2.Comprehend the procedures of setting up of agro-based industries CO3.Analyse the various activities and linkages in agri-value chain and the business environment CO4.Assess the capital, financial and marketing management of agribusiness CO5.Develop skills in project formulation, appraisal and evaluation CO6.Do agribusiness
77	BSAG-501 : Principles of Integrated Pest and Disease Management	CO1.Collect data on pest and disease attacks in a farmer's field CO2.Calculate the threshold level of crop pests and diseases CO3.Device crop pest and disease control measures

		CO4.Recommend integrated pest and disease control measures CO5.Diagnose, assess and practice integrated pest and disease management
78	BSAG-502: Manures, Fertilizers and Soil Fertility Management	CO1.Comprehend the utility of manures CO2.Interpret the importance of varied forms of plant fertilizers CO3.Interpret deficiency and toxicity symptoms of nutrients in plants CO4.Describe fertility status of soil CO5.Deduce fertilizer application methods based on plant and soil analysis CO6.Estimate plant and soil nutrients and provide recommendations
79	BSAG-503: Pests of crops and stored grains and their management	CO1.Identify major pests of field crops and comprehend their management practices CO2.Acquire knowledge on pest management in fruit crops CO3.Explain the methods of pest identification and their management in vegetables CO4.Demonstrate damage symptoms caused by insect pests and their management in plantation, garden, narcotic,spice and condiment crops CO5.Comprehend grain store management CO6.Assess losses created due to insect pests in crops and recommend control measures
80	BSAG-504: Pests of crops and stored grains and their management	CO1. Identify and manage major diseases of cereals and millets CO2. Manage diseases of pulses and oilseeds CO3. Understand the management practices of major diseases affecting vegetables CO4. Recognize disease symptoms of fruit crops and plan control measures CO5. Comprehend the disease management practices of plantation crops CO6. Recommend management practices for major diseases of agricultural and horticultural crops
81	BSAG-505: Crop Improvement – I (Kharif)	CO1. Infer the importance of plant genetic resources and utilize it in crop improvement CO2. Design crop specific breeding methodology CO3. Comprehend breeding methods specific to an objective CO4. Describe hybrid seed production of various

		Kharif crops CO5. Practice hybridisation and plant breeding
82	BSAG-506: Entrepreneurship Development, Business Communication and IPR	CO1. Acquire knowledge on entrepreneurship development CO2. Develop organizational, managerial, problem-solving and project planning skills CO3. Analyze the types of intellectual property and legislations covering IPR in India CO4. Acquire knowledge on protection of plant varieties and biological diversity CO5. Comprehend agri-business projects, property and diversity protections
83	BSAG-507: Geo informatics, nanotechnology, and precision farming	CO1. Define the role of remote sensing in precision agriculture CO2. Demonstrate the knowledge gained on geographical information system CO3. Comprehend simulation models on precision agriculture CO4. Explain the role of nanotechnology in improving agriculture CO5. Apply geo informatics and nanotechnology in precision farming projects
84	BSAG-508: Intellectual property rights	CO1. On completion of this unit of study, students should be able to: CO2. Apply intellectual property law principles (including copyright, patents, designs and trademarks) to real problems and analyse the social impact of intellectual property law and policy CO3. Work in teams, solve problems and manage time CO4. Analyse ethical and professional issues which arise in the intellectual property law context CO5. Write reports on project work and critical reflect on your own learning.
84	BSAG-509: Principles of Integrated Pest and Disease Management	CO1. Collect data on pest and disease attacks in a farmer's field CO2. Calculate the threshold level of crop pests and diseases CO3. Device crop pest and disease control measures CO4. Recommend integrated pest and disease control measures CO5. Diagnose, assess and practice integrated pest and disease management

85	BSAG- 510: Manures, Fertilizers and Soil Fertility Management (Practical)	CO1. Comprehend the utility of manures CO2. Interpret the importance of varied forms of plant fertilizers CO3. Interpret deficiency and toxicity symptoms of nutrients in plants CO4. Describe fertility status of soil CO5. Deduce fertilizer application methods based on plant and soil analysis CO6. Estimate plant and soil nutrients and provide recommendations
86	BSAG-511: Pests of crops and stored grains and their management(Practical)	CO1. Identify major pests of field crops and comprehend their management practices CO2. Acquire knowledge on pest management in fruit crops CO3. Explain the methods of pest identification and their management in vegetables CO4. Demonstrate damage symptoms caused by insect pests and their management in plantation, garden, narcotic,spice and condiment crops CO5. Comprehend grain store management CO6. Assess losses created due to insect pests in crops and recommend control measures
87	BSAG-512: Pests of crops and stored grains and their management (Practical)	CO1. Identify and manage major diseases of cereals and millets CO2. Manage diseases of pulses and oilseeds CO3. Understand the management practices of major diseases affecting vegetables CO4. Recognize disease symptoms of fruit crops and plan control measures CO5. Comprehend the disease management practices of plantation crops CO6. Recommend management practices for major diseases of agricultural and horticultural crops
88	BSAG-513: Crop Improvement – I (Kharif) (Practical)	CO1. Infer the importance of plant genetic resources and utilize it in crop improvement CO2. Design crop specific breeding methodology CO3. Comprehend breeding methods specific to an objective CO4. Describe hybrid seed production of various Kharif crops CO5. Practice hybridisation and plant breeding
89	BSAG-514:	CO1. Acquire knowledge on entrepreneurship

	Entrepreneurship Development, Business Communication and IPR (Practical)	development CO2. Develop organizational, managerial, problem-solving and project planning skills CO3. Analyze the types of intellectual property and legislations covering IPR in India CO4. Acquire knowledge on protection of plant varieties and biological diversity CO5. Comprehend agri-business projects, property and diversity protections
90	BSAG-515: Geo informatics, nanotechnology, and precision farming (Practical)	CO1. Define the role of remote sensing in precision agriculture CO2. Demonstrate the knowledge gained on geographical information system CO3. Comprehend simulation models on precision agriculture CO4. Explain the role of nanotechnology in improving agriculture CO5. Apply geo informatics and nanotechnology in precision farming projects
91	BSAG-516: Practical Crop Production-I (Kharif Crops)	CO1. Plan and decide on growing a suitable kharif crop CO2. Decide on the best cropping system that can be followed for a kharif season CO3. Recommend package of practices for growing kharif crops CO4. Practice kharif crop production through integrated management CO5. Calculate cost benefit ratio based on cultivation and marketing expenses of a crop
92	BSAG 517: Landscaping	CO1. Understand the basic principles and importance of landscaping CO2. Select and propagate plants suitable for landscaping CO3. Propagate and manage pot plants CO4. Contribute to improve bio-aesthetic landscaping architecture in urban and rural areas CO5. Manage bonsai and lawns CO6. Develop and design sustainable landscapes
93	BSAG- 518: Landscaping (Practical)	CO1. Understand the basic principles and importance of landscaping CO2. Select and propagate plants suitable for landscaping CO3. Propagate and manage pot plants

		CO4. Contribute to improve bio-aesthetic landscaping architecture in urban and rural areas CO5. Manage bonsai and lawns CO6. Develop and design sustainable landscapes
94	BSAG-519: Micro propagation Technologies	CO1. Understand how in vitro culture originated and appreciate its applications CO2. Comprehend the various types of plant tissue culture and its importance CO3. Demonstrate mass multiplication of micropropagules CO4. Apply tissue culture techniques in crop improvement CO5. Examine the demands of the plant tissue culture industry CO6. Practice plant tissue culture techniques and become an entrepreneur
95	BSAG-520: Micro propagation Technologies (Practical)	CO1. Understand how in vitro culture originated and appreciate its applications CO2. Comprehend the various types of plant tissue culture and its importance CO3. Demonstrate mass multiplication of micropropagules CO4. Apply tissue culture techniques in crop improvement CO5. Examine the demands of the plant tissue culture industr CO6. Practice plant tissue culture techniques and become an entrepreneur
96	BSAG-521: Biopesticides and Biofertilizers	CO1. Acquire knowledge on scope and importance of biopesticides CO2. Demonstrate mass production and application technology of biopesticides CO3. Comprehend the types of biofertilizers and their characteristics features CO4. Explain the mechanism and mass production of biofertilizers CO5. Demonstrate the different methods of biofertilizer application CO6. Mass produce biopesticides and biofertilizers
97	BSAG-522: Biopesticides and Biofertilizers (Practical)	CO1. Acquire knowledge on scope and importance of biopesticides CO2. Demonstrate mass production and application technology of biopesticides

		CO3. Comprehend the types of biofertilizers and their characteristics features CO4. Explain the mechanism and mass production of biofertilizers CO5. Demonstrate the different methods of biofertilizer application CO6. Mass produce biopesticides and biofertilizers
98	BSAG-523: System simulation and Agro-advisory	CO1. Illustrate crop model concepts and soil-plant-atmospheric continuum CO2. Summarize the importance of crop growth models to increase crop production CO3. Develop yield models for different crops to predict yield CO4. Comprehend weather forecasting CO5. Explain about various simulation models for preparation of agro advisories CO6. Make use of crop models and statistical approaches to predict yield of crops, forecast pests and diseases.
99	BSAG-524: System simulation and Agro-advisory (Practical)	CO1. Illustrate crop model concepts and soil-plant-atmospheric continuum CO2. Summarize the importance of crop growth models to increase crop production CO3. Develop yield models for different crops to predict yield CO4. Comprehend weather forecasting CO5. Explain about various simulation models for preparation of agro advisories CO6. Make use of crop models and statistical approaches to predict yield of crops, forecast pests and diseases.

COURSE OUTCOMES OF HOTEL MANAGEMENT

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	BHMCT-101 Food Production Foundation	CO1: To give the basic knowledge of cooking to the beginners. CO2: To make them understand about the meaning, aims, objectives, kitchen organization. CO3: This course will give knowledge of structure, different kinds of ingredients and techniques of pre-preparation and cooking. CO4: They will get versed with knowledge of various stocks, sauces and soups, various cuts of vegetables.
2.	BHMCT-103 Food & Beverage Service Foundation	CO1: To inculcate knowledge of food service principles. CO2: To give the knowledge of functions of food and beverage services. CO3: The course aims to provide knowledge of food and beverage procedures among trainees
3.	BHMCT-105 Front Office Foundation	CO1: This course familiarizes the students with various functions of front office. CO2: The course is aimed at familiarizing the students with various functions of to develop work ethics towards customers and satisfaction. CO3: Special efforts will be made to inculcate practical skill.
4.	BHMCT-107 Accomodation Operations	CO1: The course familiarizes students with the organization of housekeeping, its systems and functions. CO2: A blend of theory and practical will be used to develop sensitivity and high work ethics towards guest care and cleanliness.
5.	BTHU103 English	CO1: The objective of this course is to introduce students to the theory, fundamentals and tools of communication. CO2: To help the students become the independent users of English language. CO3: To develop in them vital communication skills which are integral to their personal, social and professional interactions CO4: The syllabus shall address the issues relating to the Language of communication. CO5: Students will become proficient in professional

		communication such as interviews, group discussions, office environments, important reading skills as well as writing skills such as report writing, note taking etc.
6.	HVPE101 Human Values, De-addiction and Traffic Rules	CO1: To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings. CO2: To facilitate the development of a Holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and there of Existence. Such a holistic perspective forms the basis of Value based living in a natural way CO3: To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behavior and mutually enriching interaction with Nature. CO4: Thus, this course is intended to provide a much needed orientation input in Value Education to the young enquiring minds.
7.	BHMCT-201 Food Production Foundation	CO1: This course gives the basic knowledge of cooking to the beginners. CO2: To get versed with different kinds of ingredients, techniques of pre-preparation and cooking. CO3: They will get versed with knowledge of various stocks, sauces and soups, cereals, pulses, various cuts of vegetables and meats with their cookery.
8.	BHMCT-203 Food & Beverage Service Foundation	CO1: To inculcate knowledge of food service principles. CO2: The course aims to inculcate knowledge of functions, and procedures among trainees. CO3: The students will be well versed with menu planning and sale control system.
9.	BHMCT – 205 Front Office Foundation	CO1: The course is aimed at familiarizing the students with various functions of front office CO2: The course is aimed at familiarizing the students to develop work ethics towards customer care and satisfaction. CO3: Special efforts will be made to inculcate practical skills.

10.	BHMCT-207 Accommodation Operation	CO1: The course familiarizes students with the organization of housekeeping, its system and functions. CO2: A blend of theory and practical will be used to develop sensitivity and high work ethics towards guest care and cleanliness and pest control.
11.	EVS102-18 Environmental Studies	CO1: Students will enable to understand environmental problems at local and national level through literature and general awareness. CO2: The students will gain practical knowledge by visiting wild life areas, environmental institutes and various personalities who have done practical work on various environmental Issues. CO3: The students will apply inter-disciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate these problems. CO4: Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.
12.	BHMCT301-18 - to BHMCT305-18 Industrial Training	CO1: The students will gain day to day on-hand practical exposure in real life business activity under the supervision of industry experts. CO2: They will also learn to co-relate theoretical knowledge with practical realities.
13.	BHMCT401 – 18 Introduction To Indian Cookery	CO1: This paper will give the practical knowledge of ndian cooking to students. CO2: They will get versed with Indian regional cuisine, basic Indian spices. CO3: They will get versed with basic Indian gravies, traditional Indian cooking methods. CO4: They will get versed with cooking equipment used and required for Indian cuisine and specific cooking ingredients.
14.	BHMCT-403 – 18 Food And Beverage service Operations	CO1: The students will be well versed with viticulture and viniculture. CO2: The students will be well versed with Beer production, types of wines and beers, brands and introduction to cheeses
15.	BHMCT-405 – 18 Front Office Operations	CO1: The course is aimed at familiarizing the students with various functions of Night Auditing & Accounting

		CO2: Students will learn about the various software being used in the Hospitality Industry.
16.	BHMCT-407 – 18 Accommodation Operations	CO1: The students will be well versed with the supervisory responsibility, Linen handling process. CO2: The students will be well versed with the Laundry Operations, need of special cleaning and also learn about Textiles or garments.
17.	BHMCT-409-18 Accounting Skills For Hospitality	CO1: The aim is to provide an understanding of the basic principles of accounting and their application in the hospitality industry. CO2: The course is designed to make the student familiar with generally accepted accounting principles of accounting and their applications.
18.	BHMCT-501-18 Food Production	CO1: The technical skills of cold kitchen of a hotel. CO2: To learn about Larder, Charcuterie. CO3: To learn various kinds of cold meats.
19.	BHMCT- 503-18 Bar Operations & Management	CO1: To inculcate knowledge of food & beverage service principles, functions, and procedures among students. CO2: To learn the importance, planning and execution of Food and beverage outlets CO3: Students will get the knowledge about the bar operations management. CO4: To induce the knowledge of all type of alcoholic and non-alcoholic drinks.
20.	BHMCT 505-18 Front Office Operations & Management	CO1: This makes familiarizing the students with various functions of front office CO2: To develop work ethics towards customer care and satisfaction. CO3: Special efforts will be made to inculcate practical skills.
21.	BHMCT 507-18 Accommodation Operations And Management	CO1: The course familiarizes students with the organization of housekeeping, its systems and functions. CO2: A blend of theory and practical will be used to develop sensitivity and high work ethics towards guest care and cleanliness.

22.	BHMCT- 509-18 Food And Beverage Control And Management	CO1: This course will provide knowledge about Principles of Purchasing, Receiving, Storing and Controlling. CO2: To learn about procedures, functions, production and sales control.
23.	BMPD 502-18 Mentoring And Professional Development	CO1: The course familiarizes students, that how to improve the body language. CO2: How to enhance the communications skills. CO3: How to present them in front of others.
24.	BHMCT 601-18 International Cuisine- An Exploration	CO1: To make student in understanding the various International cuisines. CO2: To learn about various sauces. CO3: This course will make them understand about different cultures and traditions followed World Wide. CO4: Different types of Spices & Herbs Used in International Cuisines.
25.	BHMCT 603-18 Banquet And Restaurant Operations & Management	CO1: The course aims to inculcate knowledge of food service principles, functions, and procedures among students. CO2: The students will learn the importance, planning and execution of Food and beverage outlets
26.	BHMCT 605-18 Front Office Management	CO1: To learn about various functions of front office. CO2: To develop work ethics towards customer care and satisfaction. CO3: Special efforts will be made to inculcate practical skills.
27.	BHMCT 607-18 Accommodation Management	CO1: The students will get knowledge about the organization of housekeeping CO2: Its systems and functions. CO3: A blend of theory and practical will be used to develop sensitivity and high work ethics towards guest care and cleanliness.

28.	BHMCT 609-18 Principles Of Management	CO1: This course will provide the basic knowledge of marketing. CO2: The hospitality products effectively and efficiently to the clients of service industry
29.	BHMCT- 701A-18 Food Production	CO1: This subject will give the basic knowledge of cooking to the potential students. CO2: They will get versed with different kinds of regional cuisines, quantity food cooking/ volume feeding, indenting, various equipment used.
30.	BHMCT-703A-18 Tandoor- Principle, Concept And Application	CO1: Students will acquire knowledge on Dum cooking and Tandoor Cooking. CO2: This course will provide knowledge about different types of marinations used in Indian section. CO3: Methods to control the temperature of tandoor during operation.
31.	BHMCT-701B-18 Food And Beverage Management	CO1: The course aims to inculcate knowledge of food service principles, functions, and procedures among students. CO2: The students will be well versed with menu planning and sale control system.
32.	BHMCT-703B–18 Event Management	CO1: Explain all the components and various roles involved in planning, organizing, running and evaluating an event. CO2: Apply the theory and skills necessary to professionally plan, organize and run a business event. CO3: Understand the importance of strategic planning for an event or festival, including monitoring and evaluating the impacts on the wider community.
33.	BHMCT 701C-18 Front Office Management	CO1: To learn about functions of front office and to develop work ethics towards customer care and satisfaction. CO2: To special efforts will be made to inculcate practical skills.
34.	BHMCT-703C-18 Tour & Travel Management	CO1: To make them understand basics of Tour & travel Management, functions, objectives.

		CO2: This course shall introduce students to tourism's growth and development. To appreciate the future of tourism. CO3: This highlights the role of tourism as an economic intervention and its significance in economy. CO4: Course discusses the global nature of tourism, Tourism product and emerging trends in tourism industry.
35.	BHMCT 701D-18 Accommodation Operations	CO1: Students will get an insight about purchase and stock control CO2: Along with that students also learn about managing contractual services and crisis situation. CO3: Students also learn about renovation CO4: Contract Cleaning concepts & Managerial Handling
36.	BHMCT 703D-18 Interior Decoration	CO1: The main objective of the course is to impart knowledge about the interior design solutions and architectural knowledge. CO2: Identify and Evaluate the technical aspects of Interior Design. CO3: This subject is to make students familiar with 2D and 3D geometrical figures. CO4: To learn about Different color schemes used in different area of hotel.
37.	BHMCT 705- Principles Of Marketing	CO1: Explain the basics of marketing, selling, marketing mix and its core concepts. CO2: Describe the intricacies of the marketing environment and marketing information systems for effective marketing planning and strategies. CO3: Develop necessary skills for effective market segmentation, targeting and positioning. CO4 – Illustrate various components of product mix, product life cycle and comprehend the new product development process. CO5– Develop an understanding of promotion mix and strategies for successful promotion
38.	BHMCT- 706-18 Financial Management	CO1: Apply financial data for use in decision making by applying financial theory to problems faced by business enterprises. CO2: Apply time value of money to various pricing and money value.

		CO3: Apply modern techniques in capital budgeting analysis. CO4: Assess dividend policy's impacts on share prices
39.	BHMCT- 707-18 Entrepreneurship	CO1: Describe the concept and theories of entrepreneurship and its role in economic development of nation. CO2: Develop business plan and identify the reasons of failure of business plans. CO3: Illustrate the steps in starting MSME. CO4: Comprehend government policies and regulatory framework available in India to facilitate the process of entrepreneurial development. CO5: Identify different sources of finance for new enterprises and assess the role of financial institutions and various government schemes in entrepreneurial development.
40.	BHMCT 801-18 Specialized Hospitality Training	CO1: The students will gain day to day on-hand practical exposure in real life business activity under the supervision of industry experts. CO2: They will also learn to co-relate theoretical knowledge with practical realities.

DEPARTMENT OF MASTER OF BUSINESS ADMINISTRATION

Program Educational Objectives (PEOs)

PEO1: To inculcate knowledge in students with experiential learning and prepare the for advance study and life long learning.

PEO2: To develop strategic understanding of fundamental principles of business and competencies in the area of accounts, marketing, interpersonal skills, human resource management and entrepreneurship.

PEO3: To train the students for dynamic business environment and apply their perspectives through innovation and creativity.

PEO4: To develop competencies in qualitative and quantitative techniques to analyse the business data as well as developing an understanding of economic, legal and social environment of Indian business.

PEO5: To inculcate leadership skills, professionalism, effective communication skills, interpersonal skills and team work in students so as to enable them to manage and collaborate in diverse work environments.

PEO6: To develop responsiveness to social issues and ability to identify business solutions to address the same. Students will also be able to understand the issues of business ethics.

Program Outcomes (POs)

The program outcomes specify the knowledge, skills, values and attitudes students are expected to attain in courses or in a program. The six outcomes of MBA program are as below:

1. Business Environment and Domain Knowledge: Economic, legal and social environment of Indian business.. Graduates are able to improve their awareness sand knowledge about functioning of local and global business environment and society. This helps in recognizing the functioning of businesses, identifying potential business opportunities, evolvement of business enterprises and exploring the entrepreneurial opportunities.

2. Critical thinking, Business Analysis, Problem Solving and Innovative Solutions: Competencies in quantitative and qualitative techniques. Graduates are expected to develop skills on analysing the business data, application of relevant analysis, and problem solving in other functional areas such as marketing, business strategy and human resources.

3. Global Exposure and Cross-Cultural Understanding: Demonstrate a global outlook with the ability to identify aspects of the global business and Cross Cultural Understanding.

4. Social Responsiveness and Ethics: Developing responsiveness to contextual social issues / problems and exploring solutions, understanding business ethics and resolving ethical dilemmas. Graduates are expected to identify the contemporary social problems, exploring the opportunities for social entrepreneurship, designing business solutions and demonstrate ethical standards in organizational decision making. Demonstrate awareness of ethical issues and can distinguish ethical and unethical behaviors.

5. Effective Communication: Usage of various forms of business communication, supported by effective use of appropriate technology, logical reasoning, articulation of ideas. Graduates are expected to develop effective oral and written communication especially in business applications, with the use of appropriate technology (business presentations, digital communication, social network platforms and so on).

6. Leadership and Teamwork: Understanding leadership roles at various levels of the organization and leading teams. Graduates are expected to collaborate and lead teams across organizational boundaries and demonstrate leadership qualities, maximize the usage of diverse skills of team members in the related context.

Course Outcomes of Master of Business Administration

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	MBA101-18 Foundations Of Management	CO1: Describe fundamental concepts and principles and conventions of accounting. CO2: Explain the role and responsibilities of managers and adapt to the various styles of management across organizations. CO3: Develop analytical abilities to face the business situations. CO4: Apply various tools that would facilitate the decision making process in the business. CO5: Develop peer based learning and working in groups and teams. CO6: To comprehend the application of various controlling techniques in management.
2.	MBA 102-18 Managerial Economics	CO1: Understand the basic concepts of economics and relate it with other disciplines and identify the importance of economics in managerial decision making. CO2: Measure price elasticity of demand, understand the determinants of elasticity and apply the concepts of price, cross and income elasticity of demand. CO3: Analyze the demand and supply conditions and assess the position of a company and explain the concepts of factors of production, collective bargaining and the underlying theories of factors of production. CO4: Recognize the relationship between short-run and long-run costs and will also be able to establish the linkage between production function and cost function CO5: Compare and contrast four basic types of market i.e. perfect, monopoly, monopolistic and oligopoly and can determine price and output under different market types. CO6: Understand basic concepts of macroeconomics and shall be able to measure national income using different approaches.
3.	MBA 103-18 Quantitative Techniques	CO1: To have a deeper and rigorous understanding of fundamental concepts in business decision making under subjective conditions.

		CO2: To apply the concepts of central tendency and variation in managerial decision making. CO3: To enhance knowledge in probability theory and normality and its distribution concepts. CO4: To understand the concept of correlation regression analysis and their applications. CO5: To apply the learnt techniques to build the best fit route of transportation for carrying schedule of activities. CO6: To apply the operations techniques in reality to market scenario.
4.	MBA 104-18 Management And Reporting	CO1 – To familiarize the students about the basic concepts, principles and process of accounting and to make them aware about the formats of financial statements of public limited, banking and insurance companies. CO2 – To explain the students about the concepts of cost and various intricacies for preparing the cost sheet. CO3 – To acquaint students about the decision making techniques using the concepts of marginal costing, standard costing and budgetary control. CO4 – To enable the students to analyze financial statements using various tools for financial analyze and interpret the financial position of a business organization. CO5 – To familiarize the students about the contemporary developments in the accounting. CO6 – To make students aware about the recent developments in financial reporting and regulations so that they may understand and appreciate the concept and process of harmonization of financial reporting practices.
5.	MBA 105-18 Business Environment And Indian Economy	CO 1: Outline how an entity operates in a complex business environment. CO 2: To systematically learn impact of legal & regulatory, macroeconomic, cultural, political, technological, global and natural environment on Business enterprise. CO 3: To examine the critical opportunities and threats that arise from an analysis of external business conditions by applying scenario planning to synthesize trends prevailing in the external environment.

		CO 4: To describe how various types of economic systems play a significant role in the success of a business. CO 5: To understand the nature of Indian Economy and various issues relating to Indian Economy having a direct or indirect impact on business environment. CO6: To discuss various development strategies in India.
6.	MBA 106-18 Business Ethics And Corporate Social Responsibility	CO1: To integrate and apply contemporary Ethics & Governance issues in a business context CO2: To analyze and apply ethics to contemporary business practices. CO3: To analyze key perspectives on corporate social responsibility and their application. CO4: To evaluate different corporate ownership structures and their key governance features. CO5: To understand the ethical decision making, ethical reasoning, the dilemma resolution process. CO6: To analyze and apply corporate governance perspectives to contemporary business practices.
7.	MBA 107-18 Business Communication For Managerial Effectiveness	CO1 - To understand the basics of communication and its process, and the various barriers in the communication. CO2 – To learn the listening skills and comprehend the value of business etiquettes CO3– To comprehend Non – Verbal communication skills and its application for effective Communication. CO4 – To learn the skills of writing effective business messages, letters and reports CO5– To develop the presentation skills and learning to organize and structure a Presentation using visual aids CO6 – To prepare the students for interview , employment messages and resume writing skills.
8.	MBA 201-18 Business Analytics for Decision Making	CO1: To have a deeper and rigorous understanding of fundamental concepts in business decision making under subjective conditions CO2: To enhance knowledge in probability theory

		and normality and its distribution concepts CO3: To conduct research surveys through multiple regression and multiple correlation CO4: To design a good quantitative purpose statement and good quantitative research questions and hypotheses CO5: To know the various types of quantitative sampling techniques and conditions to use. CO6: To utilize the time series method to predict the future of sales in a concern.
9.	MBA 202-18 Legal Environment for Business	CO1. Students shall be able to understand the legal and regulatory framework of business environment. CO2. Students shall be able to identify the fundamental legal principles behind contractual agreements. CO3. Students shall be able to understand the legal provisions of sales of goods. CO4. Students shall be able to understand the concept of negotiable instruments as well as rules pertaining to crossing, transferring and dishonoring of negotiable instruments. CO5. Students shall have understanding of legal rules governing admission, retirement and death of partner and dissolution of partnership firm. CO6. Students shall be able to understand the legal framework relating to the process of incorporation of Joint Stock Company
10.	MBA 203-18 Marketing Management	CO1 - To learn the basics of marketing, selling, marketing mix and its core concepts. CO2 – To understand the intricacies of the marketing environment and marketing information systems for effective marketing planning and strategies. CO3– To equip the students with necessary skills for effective market segmentation, targeting and positioning CO4 – To prepare the students for understanding the various components of product mix, product life cycle and comprehend the new product development process. CO5– To develop an understanding of promotion mix and strategies for successful promotion CO6 – To gain knowledge about the emerging

		trends in marketing and pyramid marketing.
11.	MBA 204-18 Human Resource Management	CO1- To explain the basics of Human Resource Management and analyze the evolution of HRM. CO2- To comprehend the environment of HRM. CO3: To appraise various functions of HRM that facilitate employee hiring viz. human resource planning, job analysis recruitment and selection. CO4: To understand the role of training, development, career planning and performance appraisal functions in human resource development. CO5: To examine the provisions of employee health, safety and welfare. CO6: To analyze the concerns of government, employees and employers in establishing Industrial relations. CO7: To illustrate mechanisms adopted by the organizations for settlement of disputes and grievances.
12.	MBA 205-18 Production & Operations Management	CO1: Understand ever growing importance of Production and Operations management in uncertain business environment. CO2: Gain an in-depth understanding of resource utilization of an organization. CO3: Appreciate the unique challenges faced by firms in services and manufacturing. CO4: Understand the subject as a crucial part of functional management. CO5: Develop skills to operate competitively in the current business scenario. CO6: Understand the concepts of inventory and purchasing management.
13.	MBA 206-18 Corporate Finance and Indian Financial System	CO1- To explain the evolution, objectives and functions of corporate finance and interface of corporate finance with other functional areas. CO2- To illustrate the concept of time values of money and valuation of securities. CO3: To comprehend the significance of capital structure theories in capital structure decisions. CO4: To understand the applications of approaches of working capital management. CO5: To be able to describe the role of various financial institutions on Indian financial system. CO6: To discuss the evolution of financial

		markets and various financial instruments.
14.	MBA 207-18 Entrepreneurship Development and Project Management	CO1- To explain the characteristics, functions and traits of an entrepreneur. CO2- To illustrate the concept of corporate entrepreneurship and development of the same in the organizations. CO3: To comprehend the significance of women entrepreneurs, rural entrepreneurship and social entrepreneurship. CO4: To examine entrepreneurial strategies to explore new entry opportunities, methods of enhancing creativity and generation of ideas. CO5: To be able to develop an effective business plan. CO6: To explain the basic concepts of project management and analyze different phases of project management viz. generation and screening of project ideas, project analysis, selection, financing, implantation and review.
15.	MBAGE 201-18 Computer Applications for Business	CO1: Develop understanding of computer fundamentals, functions and their classifications CO2: Develop a clear understanding and knowledge about the functioning of a Computer software and window operating system CO3: Demonstrate proficiency in Microsoft word & Excel. CO4: Apply formatting and editing features to enhance worksheets. CO5: Use styles, themes, and conditional formats to customize worksheets. CO6: apply the concepts of data base and Access for editing Data; managing reports and labels, Managing Multiple Tables.
16.	MBA 301-18 Organizational Behaviour & Design	CO1- To explain the basics of Organizational behaviour and various challenges for OB in national and global environment. CO2- To illustrate the foundations of Individual Behaviour and analyze the influence of individual level factors viz. learning, personality, perception, attitude and motivation on behavior in organizations. CO3: To assess the significance of leadership and role of leadership styles in effectiveness of the team. CO4: To examine the dynamics of group

		development, group properties and formation of organizational culture. CO5: To demonstrate dimensions of organizational design and types of organizational structure and to analyze the influence of environment on organizational design. CO6: To interpret the effect of political climate (conflict, power and politics) on human behavior.
17.	MBA 302- 18 Marketing Research	CO1: Understand the process of marketing research and its application in managerial decision making CO2: Identify various sources of data for marketing research. CO3: Examine different research methods and be able to apply them. CO4: Identify different research designs and develop a research proposal. CO5: Design an effective questionnaire and test reliability and validity of the scales. CO6: Apply different methods of data preparation and data analysis.
18.	HVPE 101-18 Human Values, De-Addiction And Traffic Rules	CO1: Understanding the need, basic guidelines, content and process for Value Education Understanding Harmony in the Human Being - Harmony in Myself. CO2:Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship CO3: Understanding Harmony in the Nature and Existence - Whole existence as Co-existence. CO4:Implications of the above Holistic Understanding of Harmony on Professional Ethics CO5: Understanding and living in harmony at various levels Self Exploration–what is it? - its content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self exploration CO6: Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario.
19.	MBA 921-18 Consumer Behaviour	CO1: Provide an understanding of how consumers make decisions. CO2: Analyze personal and environmental factors that influence consumer decisions. CO3: Understand the processes used when individuals, group or organizations make buying

		decisions. CO4: Understand how and why marketers craft particular messages to appeal to consumers. CO5: Understand the interrelationship with other functional areas of business as a part of the management process. CO6: Assess the process of opinion leadership and its relationship with firm's promotional strategy.
20.	MBA 922-18 Services Marketing	CO1: Understand the fundamental concepts of service marketing and its functions. CO2: Identify the role and significance of various elements of service marketing mix. CO3: Analyze customer requirement, measure service quality and design and deliver better service. CO4: Analyze integrated services marketing communications and services marketing triangle. CO5: Examine various pricing strategies and pricing approaches in service sectors. CO6: Understand service marketing applications in different service sectors.
21.	MBA 911-18 Investment Analysis and Portfolio Management	CO1 – To familiarize the students about the basic concepts, various investment avenues, process of investment and market microstructure of financial markets. CO2 - To enable students to understand the operation of primary as well as secondary markets in India and to understand the concepts of risk and its measurement. CO3 – To familiarize the students with the concepts and process of fundamental analysis so that they may understand the impact of various environmental factors on investment valuation. CO4 – To explain the concepts and process of technical analysis and enable the students to understand the role of daily price movements in portfolio management. CO5 – To explain the concepts, process and techniques for portfolio construction, evaluation and revision. CO6 – To familiarize the students about the financial derivatives and computation of their expected payoffs.
22.	MBA 912-18	CO1: To understand the concept of financial

	Management of Financial Services	services and their importance. CO2: To know the structure and schemes of mutual funds. CO3: To understand the importance and process of Dematerializations and re-materialization. CO4: To know the structure and system of credit rating ,leasing ,merchant banking and venture capital. CO5: To know the process and importance of factoring and securitization. CO6: To understand the process of asset liability management and risk management in banks
23.	MBA 931-18 Organizational Change and Development	CO1:Develop understanding of organization change and Define, explain and illustrate theories of planned change, their relevant foundations, strengths and weaknesses. CO2:Recognize and comment on issues and problems arising out of organizational change initiatives. CO3:To Understand concepts related to system theory, Action Research and Models, CO4:Understand the role of various intervention strategies in organizational development. CO5:Facilitate organizational change; and apply diagnostic models and concepts to change issues at the organizational, group and individual levels. CO6: Examine various issues in the relationship between client and consultant relationship.
24.	MBA 932-18 Employee Relations	CO1: Understand establishing & maintaining a sound relationship between the worker & the employer. CO2: Understand the significance & functioning of Trade Unions. CO3: Identify the simmering issues which might take the form of a dispute in the workplace. CO4: Examine various provisions laid down by laws to settle disputes in the organizations. CO5: Assess the importance of various Acts in Industrial Relations. CO6: Comprehend the concept and classification of labour welfare.
25.	MBA401-18 Corporate Strategy	CO1: Understand the concepts of strategic management process and strategic decision making process. CO2: Discuss various techniques of external as

		well as internal environmental analysis of business. CO3: Explain various business level and corporate level strategies for the growth of the business along with their implications. CO4: Illustrate the issues involved in strategy implementation and the role of leadership, communication and organizational structure in implementation of strategy. CO5: Develop various functional plans for successful implementation of strategy. CO6: Understand organizational systems and techniques of strategic evaluation and control.
26.	MBA 924-18 Retail Management	CO1: Understand opportunities and challenges in retail management and retail management decision process. CO2: Examine various types of retail formats and comprehend the application of theories of retail development on business models in retail. CO3: Discuss and apply various function of store management. CO4: Recognize the importance of store design and apply the concepts of store design to determine store layout and merchandising. CO5: Understand the importance of customer service in improving retail service qualities. CO6: Describe the applications of IT in retailing.
27.	MBA 926-18 Product and Brand Management	CO1: Understand what a product is, the various levels which make it up, and different types of products. CO2: Examine various challenges and issues involved in product planning and development. CO3: Discuss and apply the concepts of test marketing and market entry of a product. CO4: Recognize the features and importance of a brand and conduct branding research. CO5: Understand the concept of brand loyalty and measuring brand performance. CO6: Describe the role of various branding strategies in brand equity management.
28.	MBA 915-18 International Finance and Financial Derivatives	CO1: Understand the framework of international exchange rate system including factors influencing exchange rates. CO2: Discuss the basics of different types of derivative contracts like futures, options and

		swaps. CO3: Understand various types of risks / exposures in forex trading and their management. CO4: Describe various theories underlying the concepts of international finance. CO5: Understand trading strategies using options contracts. CO6: Describe the regulatory framework of derivatives contracts in India.
29.	MBA 916-18 Taxation and Personal Financial Planning	CO1 – The students will be familiarized with the concepts of tax management, tax avoidance and tax evasion and the methods of ways of tax planning. CO2 – To acquaint students with the provision of the current finance act with regard to various head of income. CO3 – To enable students to compute the tax liability of individuals after considering their residential status, various exempted incomes, permissible deduction, clubbing of income and setting off of losses. CO4 – To familiarize students with the concept, objectives and importance of personal financial planning and enable the students to understand the implications of environmental factors and time value of money on the personal financial statements. CO5 – To enable students to identify various types of risks any individual is exposed to and how they can hedge diversifiable risk. CO6 – To familiarize students with various instruments available for investment by an individual for achieving their personal financial goals.
30.	MBA 934-18 Strategic Human Resource Management	CO1: Understand an integrated approach to the development of HR strategies that enable the organization to achieve its goals. CO2: Describe the process of strategic HRM. CO3: Discuss the strategic role of HR systems such as strategic staffing, strategic appraisal, strategic reward system etc. CO4: Explain various human aspects of strategy implementation.

		CO5: Identify the role of leadership in implementing strategic change. CO6: Understand Global HRM and role of global HRM in successful implementation of MNC strategy.
31.	MBA 936-18 Performance and Compensation Management	CO1: Increase the awareness of the process and principles of performance Management / appraisal. CO2:Identify the negative aspects of appraisal systems and consider how these might be overcome. CO3: Discuss performance with regard to pay awards, and whether these should, or should not be automatically related to each other. CO4: Demonstrate a familiarity with the appeal process relating specifically to the performance review. CO5: Illustrate different ways to strengthen the pay-for-performance link and also learn the concepts of Payment and employee benefits issues for contingent workers. CO6: Develop appropriate reward and compensation policies.
32.	MBA 402-18 Viva-Voce for Project/Dissertation MBA 403-18 Workshop on Indian Ethos	CO1: Comprehend and practice Indian Ethos and values system. CO2: Applying value based management and ethical practices in business. CO3: To gain the knowledge of management principles from Vedas and other holy books and explain the application of Indian heritage in business. CO4: To comprehend various stress management techniques and their applications in organizations. CO5: To describe salient features and advantages of ancient Indian system of learning.

Department of BBA

Program Educational Objectives (PEOs)

PEO1: Graduates will develop expertise in the area of accounts, marketing, interpersonal skills, human resource management and entrepreneurship.

PEO2: Graduates will develop competencies in qualitative and quantitative techniques to analyse the business data.

PEO3: Graduates will develop an understanding of economic, legal and social environment of Indian business.

PEO4: Graduates will develop responsiveness to social issues and will be able to identify business solutions to address the same. They will also be able to understand the issues of business ethics.

Program Outcomes (POs)

At the end of the program the student will be able to:

PO1: Evaluate and describe contextual forces (macro and micro both) in business environment and identify their impact on business operations.

PO2: Recognise and apply various qualitative, technical and analytical methods in solving business problems.

PO3: Communicate effectively in various business settings both in written and oral formats.

PO4: Explain the responsibility of business towards development of society. Students will also be able to distinguish between ethical and unethical behaviours.

PO5: Develop strategies for effective functioning of functional areas such as marketing, strategy, finance and operations.

PO6: Apply the entrepreneurial and managerial skills for effective business management.

Course Outcomes of Bachelor of Business administration

S.No.	*Course Code and Name*	*Course Outcomes*
1.	BBA 101-18 Principles and Practices of Management	CO1: Describe fundamental concepts, nature and principles of Management. CO2: Explain the role and responsibilities of managers and adapt to the various styles of management across organizations. CO3: Develop analytical abilities to face the business situations. CO4: Apply various tools that would facilitate the decision making process in the business. CO5: Develop peer based learning and working in groups and teams.
2.	BBA 102-18 Basic Accounting	CO1: To understand the basic underlying concepts, principles and conventions of accounting. CO2: To identify the rules of debit and credit in accounting. CO3: To get an overview of the regulatory framework of accounting in India. CO4: To prepare trading, profit & loss and balance sheet of a firm. CO5: To comprehend the concept of depreciation and different methods to treat depreciation in accounting.
3.	BBA-GE 101 -18 Managerial Economics- I	CO1: Understand the basic concepts of managerial economics and apply the economic way of thinking to individual decisions and business decisions. CO2: Measure price elasticity of demand, understand the determinants of elasticity and apply the concepts of price, cross and income elasticity of demand. CO3: Understand and estimate production function and Law of Diminishing Marginal Utility. CO4: Understand and explain four basic market models of perfect competition, monopoly, monopolistic competition, and oligopoly, and how price and quantity are determined in each model. CO5: Understand the different costs of production and how they affect short and long run decisions.
4.	BTHU103/18 English	CO1: To develop in them vital communication skills which are integral to their personal, social and professional interactions.

		CO2: The syllabus shall address the issues relating to the Language of communication. Students will become proficient in professional communication such as interviews, group discussions, office environments, important reading skills as well as writing skills such as report writing, note taking etc. CO3:The recommended readings given at the end are only suggestive; the students and teachers have the freedom to consult other materials on various units/topics given below. Similarly, the questions in the examination will be aimed towards assessing the skills learnt by the students rather than the textual content of the recommended books. AE
5.	BTHU104/18 English Practical/ Laboratory	CO1: The objective of this course is to introduce students to the theory, fundamentals and tools of communication. CO2: To help the students become the independent users of English language. CO3:To develop in them vital communication skills which are integral to personal, social and professional interactions. CO4:The syllabus shall address the issues relating to the Language of communication. Students will become proficient in professional communication such as interviews, group discussions and business office environments, important reading skills as well as writing skills such as report writing, note taking etc. CO5:The recommended readings given at the end are only suggestive; the students and teachers have the freedom to consult other materials on various units/topics given below. Similarly, the questions in the examination will be aimed towards assessing the skills learnt by the students rather than the textual content of the recommended books.
6.	HVPE 101-18 Human Values, De-addiction and Traffic Rules	CO1: To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings. CO2: To facilitate the development of a Holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and the rest of Existence. Such a

		holistic perspective forms the basis of Value based living in a natural way. CO3: To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behavior and mutually enriching interaction with Nature. Thus, this course is intended to provide a much needed orientational input in Value Education to the young enquiring minds.
7.	HVPE 102-18 Human Values, De-addiction and Traffic Rules (Lab/Seminar)	CO1: One each seminar will be organized on Drug De-addiction and Traffic Rules. Eminent scholar and experts of the subject will be called for the Seminar at least once during the semester. It will be binding for all the students to attend the seminar.
8.	BMPD102-18 Mentoring and Professional Development	CO1: The objective of mentoring will be development of Overall Personality , Aptitude (Technical and General) , General Awareness (Current Affairs and GK),Communication Skills & Presentation Skills. CO2: The course shall be split in two sections i.e. outdoor activities and class activities. For achieving the above, suggestive list of activities to be conducted are various Class Activities & Outdoor Activities
9.	BBA 201-18 Business Statistics	CO1: To learn the basic concepts like statistics and calculation of arithmetic mean, median and mode and partition values. CO2: To understand the calculation of moments, skewness and kurtosis and determining whether the given distribution is normal or not. CO3: To be acquainted with prerequisite knowledge required to understand the Probability and applications of probability theory. CO4: To understand the concept of correlation regression analysis and their applications. CO5: To apply the learnt techniques in statistical testing and their applications.
10.	BBA202-18 Business Environment	CO1: To Identify and evaluate the complexities of business environment and their impact on the business. CO2: To analyze about the relationships between Government and business and understand the political, economic, legal and social policies of the country .

		CO3: To understand the current economic conditions in developing emerging markets, and evaluate present and future opportunities. CO4: To be acquainted with prerequisite knowledge required to understand the Probability and applications of probability theory. CO5: To understand the concept of the Industrial functioning and strategies to overcome challenges in competitive markets.
11.	BBAGE 201-18 Managerial Economics-II	CO1: Explain the concept of national income and its measurement using different approaches. CO2: Describe the underlying theories of demand and supply of money in an economy. CO3: Make use of employment and national income statistics students will be able to describe and analyze the economy in quantitative terms. CO4: Interpret macroeconomic issues like money, inflation and unemployment. CO5: Identify the phases of the business cycle and the problems caused by cyclical fluctuations in the market economy.
12.	AECC EVS102-18 Environment Studies	CO1. Students will enable to understand environmental problems at local and national level through literature and general awareness. CO2. The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who have done practical work on various environmental Issues. CO3. The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate these problems. CO4. Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.
13.	BMPD202-18 Mentoring and Professional Development	CO1:The objective of mentoring will be development of Overall Personality , Aptitude (Technical and General) ,General Awareness (Current Affairs and GK) ,Communication Skills &Presentation Skills. CO2:The course shall be split in two sections i.e. outdoor activities and class activities. For achieving the above, suggestive list of activities to be conducted are various Class Activities and Outdoor Activities.

14.	BBA 301- 18 Organizational Behaviour	CO1: To explain the basics of Organizational behaviour and various challenges for OB. CO2: To illustrate the foundations of Individual Behavior and various factors influencing individual behaviour viz. learning, personality, perception, attitude and motivation. CO3: To examine the dynamics of group development and group properties. CO4: To understand various dimensions of organizational culture. CO5: To analyze the process of conflict management and approaches to stress management.
15.	BBA 302- 18 Marketing Management	CO1: Explain the basics of marketing, selling, marketing mix and its core concepts. CO2: Describe the intricacies of the marketing environment and marketing information systems for effective marketing planning and strategies. CO3: Develop necessary skills for effective market segmentation, targeting and positioning. CO4 – Illustrate various components of product mix, product life cycle and comprehend the new product development process. CO5: Develop an understanding of promotion mix and strategies for successful promotion
16.	BBA 303-18 Cost And Management Accounting	CO1: Understand and differentiate between Cost accounting and management accounting. CO2: Make managerial decisions regarding make or buy, acceptance or rejection of export offers and continuation or shut down of plant. CO3: Estimate the breakeven point of the firm. CO4: Understand and apply the concepts of budgetary control for better decision-making. CO5: Understand and estimate material, labour, overheads and sales variances for comparing planned with actual results.
17.	BBA- 304 -18 Production and Operations Management	CO1: Understand ever growing importance of Production and Operations management in uncertain business environment. CO2: Gain an in-depth understanding of resource utilization of an organization. CO3: Appreciate the unique challenges faced by firms in services and manufacturing. CO4: Understand the subject as a crucial part of functional management. CO5: Develop skills to operate competitively in the

		current business scenario.
18.	BBA- SEC 301-18 IT Tools for Business	CO1: Develop understanding of computer fundamentals, functions and their classifications CO2: Develop a clear understanding and knowledge about the functioning of a Computer software and window operating system CO3: Demonstrate proficiency in Microsoft word & Excel. CO4: Apply formatting and editing features to enhance worksheets. CO5: Use styles, themes, and conditional formats to customize worksheets.
19.	BMPD302-18 Mentoring and Professional Development	CO1: The objective of mentoring will be development of Overall Personality, Aptitude (Technical and General) ,General Awareness (Current Affairs and GK),Communication Skills & Presentation Skills. CO2: The course shall be split in two sections i.e. outdoor activities and class activities. For achieving the above, suggestive list of activities to be conducted are various Class Activities and Outdoor activities.
20.	BBA 401 -18 Business Research Methods	CO1: Explain the objectives and process of conducting research and its application in business. CO2: Analyze the different types of research design and experimental errors. CO3: Understand various techniques of sampling and methods of data collection. CO4: Examine different types of scales and appraise about data preparation and analysis. CO5: Identify and prepare various types of reports.
21.	BBA 402 -18 Human Resource Management	CO1- To explain the basics of Human Resource Management and analyze the evolution of HRM. CO2: To appraise various functions of HRM that facilitate employee hiring viz. human resource planning, job analysis recruitment and selection. CO3: To understand the role of training, development, career planning and performance appraisal functions in human resource development. CO4: To analyze the functions of compensation management namely, wages and salary administration, incentives and fringe benefits. CO5: To comprehend the meaning and concept of Industrial relations.

22.	BBA 403-18 Financial Management	CO1: Apply financial data for use in decision making by applying financial theory to problems faced by business enterprises. CO2: Apply foundational finance theories and to analyze a forecast using relevant data and to conduct preliminary measurement of leverage analysis. CO3: Apply time value of money techniques to various pricing and budgeting problems. CO4: Apply modern techniques in capital budgeting analysis. CO5: Assess dividend policy's impacts on share prices and to understand the implications of Dividend decisions in financial decision making.
23.	BBA GE- 401 -18 Entrepreneurship Development	CO1: Describe the concept and theories of entrepreneurship and its role in economic development of nation. CO2: Develop business plan and identify the reasons of failure of business plans. CO3: Illustrate the steps in starting MSME. CO4: Comprehend government policies and regulatory framework available in India to facilitate the process of entrepreneurial development. CO5: Identify different sources of finance for new enterprises and assess the role of financial institutions and various government schemes in entrepreneurial development.
24.	BBA SEC- 401 -18 Business Ethics & Corporate Social Responsibility	CO1: Explore the relationship between ethics and business across different cultural traditions CO2: Understand the relationship between ethics, morals and values in the workplace CO3: Discuss the moral and social responsibility dimensions of corporate governance. CO4: Describe models of CSR in India. CO5: Assess international framework for CSR.
25.	BMPD402-18 Mentoring and Professional Development	CO1:The objective of mentoring will be development of: Overall Personality Aptitude (Technical and General) General Awareness (Current Affairs and GK) Communication Skills Presentation Skills CO2:The course shall be split in two sections i.e. outdoor activities and class activities. For achieving the above, suggestive list of activities to be conducted are various Class Activities and Outdoor

		Activities.
26.	BBA 501-18 Operation Research	CO1: Formulate and solve simple and complex optimization problems. CO2: Formulate and solve transportation and assignment problems for cost minimization. CO3: Formulate and solve job sequencing and network models. CO4: Carry out economical replacement analysis for obsolete /worn out industrial equipment. CO5: Formulate and solve different inventory model problems.
27.	BBA 502-18 Mercantile Law	CO1: Understand the applicability of various laws applicable to different business CO2: Understanding and implementing various contract acts applicable to business CO3: Learning and understanding the different types of negotiable instruments CO4: Understanding various acts applicable to partnership firm of business CO5: Gain knowledge about the applicability of different rights and protective laws for consumers.
28.	BBA 511-18 Consumer Behaviour	CO1: Understand the concept of consumer behaviour and the emerging trends. CO2: Acquire knowledge on factors affecting the behaviour and perception of the consumers. CO3: Learn and understand the impact of social and cultural setting on consumer behavior. CO4: Understand the process of consumer decision making.
29.	BBA 512-18 Advertising and Sales Management	CO1: Understand the basic concepts of advertisements & the way these advertisements are created. CO2: Acquire knowledge about the type of media used and planning/ scheduling of media. CO3: Understand the ethics to be practiced in advertising. CO4: Identify the concept and role of Sales management CO5: Understand the hiring process of sales force management and role of technology in sales.
30.	BBA 531-18 Industrial Relations and Labour Laws	CO1: Describe fundamental concepts and nature of Industrial Relations. CO2: To understand the nature and role of trade unions for workers and industries. CO3: To study the relevance of collective bargaining

		and its impact on employee-management relations. CO4: To understand industrial disputes and ways to resolve them. CO5: To apply various industrial legislations in business.
31.	BBA 532-18 Organization Change and Development	CO1. Different approaches to managing organizational change and understand and utilize the competencies to induce and manage changes organization, group and individual levels. CO2. Understand the framework Organizational Development and its foundations CO3. Design and implement effective intervention strategies and to learn abilities to critically address problems of implementation, responsibility and measurement of effectiveness CO4.Understand the contemporary issue in OD.
32.	BMPD502-18 Mentoring and Professional Development	CO1: Development of Overall Personality, Aptitude (Technical and General), General Awareness (Current Affairs and GK), Communication Skills & Presentation Skills. CO2: The course shall be split in two sections i.e. class activities and outdoor activities. For achieving the above, suggestive list of activities to be conducted are various Class Activities and Outdoor Activities.
33.	BBA 601-18 Strategy Management	CO1 Gain familiarity with the basics of strategy planning CO2 Understand the complete process of strategic management- planning, implementation and control CO3 Comprehend various models of strategic choice CO4 Identify and understand different types of strategy and its applicability in corporate world
34.	BBA 602-18 Company Law	CO1: Understand the various clauses of Indian Companies Act-2013 CO2: Know the procedure of formation of a company and winding up of a company. CO3: Describe the borrowing powers of a company CO4: Know about the appointment and removal of directors. CO5: Develop an understanding of conducting of board and other meetings.
35.	BBA 611-18 Services Marketing	CO1: Understand the different types Services and its characteristics. CO 2: Comprehend the customer centric approach in the service marketing

		CO3: Know about various concepts of marketing and its integration with services CO4: Infer about delivery of the services with customer centric approach.
36.	BBA 612-18 - Retailing and Logistics Management	CO1 Understand the significance of retailing and various retail formats available CO2 Gain knowledge of retailing strategy and financial and human resource management in retailing CO3 Comprehend merchandise and store management strategy CO4 Develop an understanding of Supply Chain Management and Logistics.
37.	BBA- 631-18 Training and Development	CO1 Understand the concepts and principles of Learning. CO2 Develop understanding about training and development concept. CO2 Able to assess training needs and select optimal method for employee Training. CO3 Develop acumen to evaluate training effectiveness. CO4 Comprehend the emerging issues for Training & development in Indian Industries.
38.	BBA 632-18 Cross Cultural Human Resource Management	CO1: Understand issues, opportunities and challenges pertaining to Cross Cultural HRM. CO2: Develop competency in dealing with cross cultural situations. CO3: Identify the role of cross cultural leadership in managing multicultural teams. CO4: Understand external forces (e.g. globalization, sociocultural changes, political and economic changes) that have the potential to shape Cross Cultural HRM. CO5: To understand different cultures with respect to cross culture differences.
39.	BMPD 602-18 Mentoring and Professional Development	CO1:The objective of mentoring will be development of Overall Personality, Aptitude (Technical and General) , General Awareness (Current Affairs and GK), Communication Skills & Presentation Skills. CO2:The course shall be split in two sections i.e. class activities and outdoor activities. For achieving the above, suggestive list of activities to be conducted are various Class Activities and Outdoor Activities.

Course Outcomes of Bachelor of Commerce (Batch 2018 onwards)

Program Educational Objectives (PEOs)

PEO1: Graduates will develop of making a positive contribution to the accountancy in public practices, Government, commerce and industry .

PE02: Graduates will be expertise in the area of marketing, finance and human resource management.

PEO3: Graduates will develop competencies in qualitative and quantitative techniques to analyze the business data.

PEO4: Graduates will develop an understanding of economic, legal and social environment of Indian business.

PEO5: Graduates will develop responsiveness to social issues and will be able to identify business solutions to address the same. They will also be able to understand the issues of business ethics.

Program Outcomes (POs)

At the end of the program the student will be able to:

PO1: Evaluate and describe contextual forces (macro and micro both) in business environment and identify their impact on business operations.

PO2: Recognize and apply various qualitative, technical and analytical methods in solving business problems.

PO3: Communicate effectively in various business settings both in written and oral formats.

PO4: Explain the responsibility of business towards development of society. Students will also be able to distinguish between ethical and unethical behaviors.

PO5: Apply the entrepreneurial and managerial skills for effective finance management.

PO6: Students will demonstrate progressive affective domain development of values, the role of accounting in society and business.

PO 7: Learners will be able to do higher education and advance research in the field of commerce and finance.

Course Outcomes

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	BCOM 101-18 Business Organization And Management	CO1: Describe fundamental concepts, nature and principles of Management. CO2: Explain the role and responsibilities of managers and adapt to the various styles of management across organizations. CO3: Develop analytical abilities to face the business situations. CO4: Apply various tools that would facilitate the decision making process in the business. CO5: Develop peer based learning and working in groups and teams.
2.	BCOM 102-18 Financial Accounting	CO1: To understand the basic underlying concepts, principles and conventions of accounting. CO 2: Identify events that need to be recorded in the accounting records. CO3: To get an overview of the regulatory framework of accounting in India. CO4: To prepare trading, profit & loss and balance sheet of a firm. CO5: Preparing accounting information for planning and control and for the evaluation of finance.
3.	BCOMGE 101-18 Managerial Economics	CO1: Understand the basic concepts of managerial economics and apply the economic way of thinking to individual decisions and business decisions. CO2: Measure price elasticity of demand, understand the determinants of elasticity and apply the concepts of price, cross and income elasticity of demand. CO3: Understand and estimate production function and Law of Diminishing Marginal Utility. CO4: Understand and explain four basic market models of perfect competition, monopoly, monopolistic competition, and oligopoly, and how price and quantity are determined in each model. CO5: Understand the different costs of production and how they affect short and long run decisions.
4.	BTHU103/18 English	CO1: The objective of this course is to introduce students to the theory, fundamentals and tools of communication.

		CO2: To help the students become the independent users of English language. CO3: To develop in them vital communication skills which are integral to their personal, social and professional interactions. CO4:The syllabus shall address the issues relating to the Language of communication. Students will become proficient in professional communication such as interviews, group discussions, office environments, important reading skills as well as writing skills such as report writing, note taking etc. CO5:The recommended readings given at the end are only suggestive; the students and teachers have the freedom to consult other materials on various units/topics given below. Similarly, the questions in the examination will be aimed towards assessing the skills learnt by the students rather than the textual content of the recommended books.
5.	AECC BTHU104/18 English Practical / Laboratory	CO1: The objective of this course is to introduce students to the theory, fundamentals and tools of communication. CO2:To help the students become the independent users of English language. CO3: To develop in them vital communication skills which are integral to their personal, social and professional interactions. CO4: The syllabus shall address the issues relating to the Language of communication. CO5: Students will become proficient in professional communication such as interviews, group discussions, office environments, important reading skills as well as writing skills such as report writing, note taking etc.
6.	AECC HVPE 101-18 Human Values, De-Addiction And Traffic Rules	CO1: To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings. CO2: To facilitate the development of a Holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the

		basis of Value based living in a natural way. CO3: To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behavior and mutually enriching interaction with Nature.
7.	AECC HVPE 102-18 Human Values, De-addiction and Traffic Rules (Lab/Seminar)	CO1: One each seminar will be organized on Drug De-addiction and Traffic Rules. Eminent scholar and experts of the subject will be called for the Seminar at least once during the semester. It will be binding for all the students to attend the seminar.
8.	BMPD102-18 Mentoring And Professional Development	CO1:The objective of mentoring will be development of Overall Personality, Aptitude (Technical and General) ,General Awareness (Current Affairs and GK), Communication Skills &Presentation Skills CO2:The course shall be split in two sections i.e. outdoor activities and class activities. For achieving the above, suggestive list of activities to be conducted are Class Activities and Outdoor activities.
9.	BCOM 201-18 Cost Accounting	CO1: Aimed to familiarize the concept of cost accounting. CO2: Helps to gather knowledge on preparation of cost sheet in its practical point of view. CO3: Analyze and provide recommendations to improve the operations of organizations through the application of Cost techniques. CO4: Analyze cost-volume-profit techniques to determine optimal managerial decisions. CO5: Apply cost accounting methods for both manufacturing and service industry.
10.	BCOM 202-18 Business Environment	CO1: To Identify and evaluate the complexities of business environment and their impact on the business. CO2: To analyze about the relationships between Government and business and understand the political, economic, legal and social policies of the country . CO3: To understand the current economic conditions in developing emerging markets, and evaluate present and future opportunities. CO4: To be acquainted with prerequisite

		knowledge required to understand the Probability and applications of probability theory. CO5: To understand the concept of the Industrial functioning and strategies to overcome challenges in competitive markets.
11.	BCOMGE201-18 Business Statistics	CO1: To learn the basic concepts like statistics and calculation of arithmetic mean, median and mode and partition values. CO2: To understand the calculation of moments, skewness and kurtosis and determining whether the given distribution is normal or not. CO3: To be acquainted with prerequisite knowledge required to understand the Probability and applications of probability theory. CO4: To understand the concept of correlation regression analysis and their applications. CO5: To apply the learnt techniques in statistical testing and their applications.
12.	AECC EVS102-18 Environment Studies	CO1. Students will enable to understand environmental problems at local and national level through literature and general awareness. CO2. The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who have done practical work on various environmental Issues. CO3. The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate these problems. CO4. Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.
13.	BMPD202-18 Mentoring and Professional Development	The objective of mentoring will be development of Overall Personality , Aptitude (Technical and General), General Awareness (Current Affairs and GK),Communication Skills and Presentation Skills. The course shall be split in two sections i.e. outdoor activities and class activities. For achieving the above, suggestive list of activities to be conducted are Class Activities Outdoor activities.

14.	BCOM 301-18 Management Accounting	CO1: To enlighten the students thought and knowledge on management Accounting. CO2: Helps to give proper idea on financial statement analysis in practical point of view. CO3: To introduce the concept of fund flow and cash flow statement. CO4: Understand and apply the concepts of budgetary control for better decision-making. CO5: To develop the know-how and concept of marginal costing with practical problems
15.	BCOM 302-18 Mercantile Law	CO1: Understand the applicability of various laws applicable to different business . CO2: Understanding and implementing various contract acts applicable to business. CO3: Learning and understanding the different types of negotiable instruments . CO4: Understanding various acts applicable to partnership firm of business. CO5: Gain knowledge about the applicability of different rights and protective laws for consumers.
16.	BCOM 303-18 Human Resource Management	CO1- To explain the basics of Human Resource Management and analyze the evolution of HRM. CO2: To appraise various functions of HRM that facilitate employee hiring viz. human resource planning, job analysis recruitment and selection. CO3: To understand the role of training, development, career planning and performance appraisal functions in human resource development. CO4: To analyze the functions of compensation management namely, wages and salary administration, incentives and fringe benefits. CO5: To comprehend the meaning and concept of Industrial relations
17.	B.COMGE 301-18 Indian Economy	CO1: Develop ideas of the basic characteristics of Indian economy. CO2. Understand the importance, causes and impact of population growth. CO3. Grasp the importance of planning undertaken by the government of India, failures and achievements as the foundation of the ongoing planning and economic reforms taken by the government. CO4. Understand a perspective on the different

		problems and approaches to economic planning and development in India.
18.	BCOM SEC 301-18 Workshop on IT tools for Business and E-Commerce	CO1: Develop understanding of computer fundamentals, functions and their classifications CO2: Develop a clear understanding and knowledge about the functioning of a Computer software and window operating system CO3: Demonstrate proficiency in Microsoft word & Excel. CO4: Apply formatting and editing features to enhance worksheets. CO5: Use styles, themes, and conditional formats to customize worksheets.
19.	BMPD302-18 Mentoring and Professional Development	The objective of mentoring will be development of Overall Personality , Aptitude (Technical and General) ,General Awareness (Current Affairs and GK), Communication Skills & Presentation Skills. The course shall be split in two sections i.e. outdoor activities and class activities. For achieving the above, suggestive list of activities to be conducted are Class Activities and outdoor activities.
20.	BCOM 401-18 Corporate Accounting	CO1: Understand and apply the basic concepts of accounting for share capital CO2: Understand accounting of preference share and debentures CO3: Acquire practical knowledge about preparation of financial statements and their provisions CO4: Understand the fundamentals of consolidation of accounts and apply them.
21.	B.COM 402-18 Company Law	CO1: Understand the various clauses of Indian Companies Act-2013 CO2: Know the procedure of formation of a company and winding up of a company. CO3: Describe the borrowing powers of a company CO4: Know about the appointment and removal of directors. CO5: Develop an understanding of conducting of board and other meetings.

22.	BCOM 403-18 Income Tax Law & Practice	CO1:To Acquire the complete knowledge of basic concepts of income tax. CO2: To understand how to calculate the income under different heads. CO3: It give more idea about the income from business or profession CO4: Make the students familiarizes with the concept of depreciation and its provisions CO5: Understand the procedure for filling the return.
23.	BCOMGE 401-18 Entrepreneurship Development	CO1: Describe the concept and theories of entrepreneurship and its role in economic development of nation. CO2: Develop business plan and identify the reasons of failure of business plans. CO3: Illustrate the steps in starting MSME. CO4: Comprehend government policies and regulatory framework available in India to facilitate the process of entrepreneurial development. CO5: Identify different sources of finance for new enterprises and assess the role of financial institutions and various government schemes in entrepreneurial development.
24.	BCOM SEC 401-18 Workshop on Computerized Accounting	CO1: Understand the concept of Computerized Accounting. CO2: Acquire the complete knowledge of Accounting Packages specially Tally software. CO3: How to implement final accounting system on software.
25.	BMPD402-18 Mentoring and Professional Development	CO1: The objective of mentoring will be development of Overall Personality, Aptitude (Technical and General) , General Awareness (Current Affairs and GK),Communication Skills and Presentation Skills. CO2: The course shall be split in two sections i.e. outdoor activities and class activities. For achieving the above, suggestive list of activities to be conducted are Class Activities and Outdoor Activities.
26.	BCOM 501-18 Financial Management	CO1: Apply financial data for use in decision making by applying financial theory to problems faced by business enterprises. CO2: Apply foundational finance theories and to

		analyze a forecast using relevant data and to conduct preliminary measurement of leverage analysis. CO3: Apply time value of money techniques to various pricing and budgeting problems. CO4: Apply modern techniques in capital budgeting analysis. CO5: Assess dividend policy's impacts on share prices and to understand the implications of Dividend decisions in financial decision making.
27.	BCOM 502-18 Goods and Service Tax	CO1: To understand the importance of indirect taxes (GST) in the Indian and global economy and its contribution to the economic development. CO2: Acquaint the knowledge about basic Exemptions under Goods and Services Tax. CO3: To enable the students to learn the skills about the provisions regarding filing of Return, Payment of Tax, Provisions related to Refund.
28.	BMPD502-18 Mentoring and Professional Development	CO1:The objective of mentoring will be development of Overall Personality, Aptitude (Technical and General) , General Awareness (Current Affairs and GK) and Communication Skills Presentation Skills. CO2:The course shall be split in two sections i.e. class activities and outdoor activities. For achieving the above, suggestive list of activities to be conducted are Class Activities and Outdoor activities.
29.	BCOP 521-18 Banking Services Management	CO1: To enlighten the student basic concepts of banking sector. CO2: To understand the Emerging Trends in Banking. CO 3: To Know about the Challenges faced by Indian Banking system. CO4: How to manage risk in Banks as well as analyze the bank statements.
30.	BCOP 522-18 Insurance Service Management	CO1: To make them understand about different types of insurance and IRDA Act. CO2: Describe the difference between Life & Non –Life insurance Products. CO3: Able to understand the various policies of Insurance. CO4: Describe the role of private sectors & regulatory bodies of Insurance sectors.

31.	BCOM 601-18 Industrial Relations and Labour Laws	CO1: Describe fundamental concepts and nature of Industrial Relations. CO2: To understand the nature and role of trade unions for workers and industries. CO3: To study the relevance of collective bargaining and its impact on employee-management relations. CO4: To understand industrial disputes and ways to resolve them. CO5: To apply various industrial legislations in business.
32.	BCOM602-18 Operation Research	CO1: Formulate and solve simple and complex optimization problems. CO2: Formulate and solve transportation and assignment problems for cost minimization. CO3: Formulate and solve job sequencing and network models. CO4: Carry out economical replacement analysis for obsolete /worn out industrial equipment. CO5:Formulate and solve different inventory model problems
33.	BMPD 602-18 Mentoring and Professional Development	CO1:The objective of mentoring will be development of Overall Personality, Aptitude (Technical and General) , General Awareness (Current Affairs and GK), Communication Skills, Presentation Skills The course shall be split in two sections i.e. class activities and outdoor activities. CO2:For achieving the above, suggestive list of activities to be conducted are Class Activities and Outdoor activities.
34.	BCOP 621-18 Banking Laws & Services	CO1: To help to gather knowledge on banking and financial system in India CO2: To provide knowledge about commercial banks and its products CO3:To aim to familiarize banking system in India. CO4: To enable them to understand better customer relationship. CO5: To create awareness about NPA and Securitization.
35.	BCOP 622-18 Risk Management and Insurance	CO1: To provide the students with a broad understanding of risk and insurance. CO2: To familiarize with the different types of insurance.

		CO3: To enable and understand the power and functions of IRDA. CO4: To create awareness about risk management.

Bachelor of Tourism and Travel Management (BTTM)

Program Education Objectives (PEOs):

PEO-1: Generating employment opportunities in Tourism Sector: To play a significant role in generating employment opportunities for tourism industry at all levels by providing expertise in itinerary preparation, Tour packaging design and trade practices in the hospitality and aviation industry.

PEO-2: Core Competencies: Enabling the students to relate tourism with its core sectors. This knowledge will be helpful in shaping a future tourism professional in the product development and in product sales & marketing.

PEO -3: Developing Leadership Qualities: To enhance students skills in the field of event operations, entrepreneurship, tourism research, diversity of special interest products and transportation management.

PEO-4: Ethics: To develop a Holistic perspective among students towards life, profession and happiness.

PEO -5: Communication Skills: To develop communication proficiency skills with greater emphasis on oral communication in the students in order to interact with the professional community and with society at large.

Program Outcomes (POs)

PO 1: Tourism and Allied Sector Knowledge: Apply the knowledge of tourism and allied Sectors to the solution of complex Tourism management problems.

PO 2: Problem Solving: Analyzing complex tourism problems and design applications to solve problems in the field of tourism.

PO-3: Communication: Students will be able to communicate effectively by using national and foreign languages both in oral and written form.

PO-4: Management Skills: Students will be able to use management skills and techniques in all routine managerial activities in all aspects of businesses effectively and efficiently.

PO-5: Destination Knowledge: Students become familiar with the techniques and approaches and apply the knowledge in the preparation of itineraries, travel blogs and travel consultations.

Course Outcomes Of Bachelor Of Tourism And Travel Management

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	BTTM 101 Tourism Concepts, Status and Trends	CO1: The course will acquaint students about the role of tourism for economic progress and its significance in global economy.
2.	BTTM-102 Geography of Tourism	CO1: The knowledge of geography will help students in designing the itineraries for the travelers, suggesting various destinations to the clients for their travel etc.
3.	BTTM -103 Indian Society and Culture	CO1: After completion of this course learner will gain core understanding of Indian society, culture and various religions in India
4.	BTTM1-104 Computer's Operations	CO1: The students will acquaint themselves with information technology by developing their contemporary skills.
5.	BTTM 105 Introduction to Hospitality Industry	CO1:Course will enable student to have overall knowledge of Different types of accommodations and types of hospitality institute
6.	BTHU-103 English	CO1The objective of this course is to introduce students to the theory, fundamentals and tools of communication. To help the students become the independent users of English language. To develop in them vital communication skills which are integral to their personal, social and professional interactions? The syllabus shall address the issues relating to the Language of communication. Students will become proficient in professional communication such as interviews, group discussions, office environments, important reading skills as well as writing skills such as report writing, note takingetc.
7.	BTHU104/18 English Practical/Laboratory	CO1: The objective of this course is to introduce students to the theory, fundamentals and tools of communication. To help the students become the independent users of English language.

		To develop in them vital communication skills which are integral to personal, social and professional interactions? The syllabus shall address the issues relating to the Language of communication. Students will become proficient in professional communication such as interviews, group discussions and business office environments, important treading skill as well as writing skills such as report writing, note taking etc.
8.	HVPE101-18 Human Values, De-addiction and Traffic Rules	CO1 : After completion of this course professional values & ethics with focus on hospitality/tourism management & operations inculcated among students
9.	BTTM- 201 COMPONENTS OF TOURISM	CO1: The learner will relate tourism with its core sectors. This knowledge will be helpful in shaping a future tourism professional.
10.	BTTM-202 Tourism product of India Punjab and Chandigarh	CO1: The knowledge of the local area is very important for the tourism professionals thus student will be enabled to have overall knowledge of the local tourism attractions and destinations.
11.	BTTM-203 Tourism product of India Art and Architecture	CO1: After the completion of this course students will gain knowledge about rich Indian Art and Architecture that will help tourism professionals in the future to be involved in the product development and in product sales & marketing.
12.	BTTM-204 Tourism Product of India Nature based	CO1: The knowledge of this course regarding natural places will provide an extra edge to the students in designing the itineraries for the nature lovers and other travelers.
13.	BTTM-205 Air travel Management	CO1: Students will be enable to understand the Aviation Industry as whole, which is considered as an important component of Tourism.
14.	EVS-102 Environmental studies	CO1: Students will enable to understand environmental problems at local and national level through literature and general awareness. CO2: The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who have done practical work on various environmental Issues.
15.	BTTM-301 Travel Agency and	CO1: Students will learn importance of the travel and tourism industry

	Tour Operations	CO2: Gain practical expertise in setting up of travel agency Learn about various linkages.
16.	BTTM -302 Principles of Management	CO1: This course helps learners to use management skills and techniques in all routine managerial activities in all aspects of businesses effectively and efficiently.
17.	BTTM -303 Essentials of Tour Guiding	CO1: Students will gain in-depth knowledge about the tour guiding profession and escorting and also become familiar with the techniques and approaches for successful presentations of the destinations to the tourists.
18.	BTTM -304 Introduction to Event Operation	CO1:At the end of the course, students will be enabling to learn about: • Planning and Organizing Events. • Role of Media • Knowledge about various risks and safety measures
19.	BTTM -305 Tourism Impacts	CO1: Students will understand various positive as well as negative impacts of tourism in terms of economic, socio cultural and Environment and how they affect society ,environment and economy , Project management.
20.	BTTM -306 Tourism product Culture and heritage	CO1: The students will gain an in-depth knowledge about rich Indian culture and heritage and generate a sense of personal identity and belongingness.
21.	BTTM-307 Special Interest Tourism	CO1: After the completion of this course Students will have the opportunity to explore a particular sector that is of interest to the man and analyze the key developments in their chosen market.
22.	BTTM -308 Environment & Tourism	CO1: The course will enable students to gain an in-depth knowledge about the synergy and conflict between tourism & environment and to make students familiar with the techniques and approaches for sustainable development of tourism.
23.	BTTM-401 Introduction to Statistics	CO1: The course will make the students aware with the basic knowledge of statistics, enabling them to appreciate and implement this knowledge in developing business strategies. This will also acquaint students with concepts and techniques used in statistics.
24.	BTTM -402 Policy Planning for tourism development	CO1: The course will develop an understanding of concepts of tourism planning for public and private sector community and regional tourism development and community participation.

25.	BTTM -403 Itinerary preparation	CO1: This course will develop an understanding of the basic concepts of itinerary preparation. This will further impart practical knowledge and s kills about the itinerary planning among learners and to make them familiar with the techniques and approaches for successful conduction of tour programme.
26.	BTTM-404 Tour packaging Design	CO1:The course will provide in-depth knowledge about the tour packaging and will make students familiar with the tour packaging techniques and strategies required for successful handling of tours
27.	BTTM-405 Basics of Entrepreneurship	CO1: This course will help students to acquire in depth knowledge about the entrepreneurship development and to become familiar with the techniques and approaches required for a successful entrepreneur.
28.	BTTM-406 Summer Internship	CO1: After completion of On The Job Training, students will able to develop and relate theory to practice. It will help them in making an informed career choice after exposure to the actual work environment. They will also observing the systems, processes, interactions and human relations in the organization. They will also get an opportunity to understand the expectations of industry.
29.	BTTM-407 Disasters Management	CO1: This course will provide students general concept in the dimensions of disasters caused by nature beyond the human control as well as the disaster and environmental hazards induced by human activities and will emphasize on disaster preparedness, response and recovery.
30.	BTTM-408 Tourism Transportation	CO1: The course will provide an in-depth knowledge about various modes of transportation and their significance in tourism. This course will also make learners to know about various emerging trends transportation sector.
31.	BTTM501 Introduction to Tourism Research	CO1: Students will be able to evaluate tourism research systematically and critically and able to apply research to tourism management problems.
32.	BTTM-502 Tourism Marketing	CO1.Examine and discuss the key concepts and principles of marketing as applied to destinations and the tourism experience CO2.To assess marketing strategies implemented in the promotion of tourism
33.	BTTM-503 Tourism Business	CO1: This will help students to understand what is requires for tourism industry in the context of its

	Environment	environment and also to understand strategy and to develop/evaluate strategic Options.
34.	BTTM-504 Human Resources Management	CO1:The course also enables students to understand the different types of skill set required for human resources in tourism industry as well as how to apply concepts and Principles of Human Resource Management in activities relating to Tourism Industry
35.	BTTM 505 Event Operation Practical	CO1: The learners will be able to understand basic framework for planning a meeting, convention, exhibition or expositions. The course will help the students to acquire the skills necessary to manage a state/national level event independently.
36.	BTTM-506 Retail Management	CO1. Understand the Organized retail sector and its operations. CO2. Understand the various strategies involved with the retail sector and emerging trends.
37.	BTTM-507 Business Tourism	CO1: After completion of this course students will be able to understand the emerging trends in the business tourism modeling and draw class diagrams.
38.	BTTM-601 Tourism Business Economics	CO1: To enable the students to understand the phenomenon impact of economic variables on businesses as well as to analyze the national and global environment of business through a macro and micro perspective of Tourism Industry in particular.
39	BTTM -602 Airline services In-flight Facilities	CO:1 :At the end of Course students will be aware about role and responsibilities of airline staff for efficient delivery of services. The course will also enable the students to acquire the necessary job knowledge and prepare them for their industry responsibilities.
40	BTTM-603 Travel And Ticketing Transportation	CO-1This course gives a brief introduction to types of various transportation, their importance, Ticketing procedures and in-flight services in handling Passengers requiring special attention. CO -2: Learners will gain in-depth knowledge about special fare using mileage system, excess Mileage Allowance –, extra Mileage Surcharge etc.
41	BTTM-604 Travel Documentation	CO:1 The students will become familiarize with travel formalities and documents required for international travel

42.	BTTM-605 Adventure tourism	CO: 1The students gain the knowledge about Definition, History and various types of adventure activities like Air ,land and water, popular global tourist destinations for adventure and role of various institutions in providing training.
43	Foreign language	At the end of the course the students will be able to: CO1:To exchange greetings in French fluently CO2:To communicate effectively CO3 :To speak fruits and vegetable name in French
44	BTTM-609 Rural community based tourism	CO:1 Students will be able to gain a basic knowledge of rural tourism concept and an understanding of tourism development process which is community centered and Role of various NGO'S in uplifting the Rural tourism

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