GLOBAL GROUP OF INSTITUTES, AMRITSAR

Program Outcomes, Program Specific outcomes, Course Outcomes of all Programs offered by Institute

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 B. Tech 1st Year (2011 Onwards)

Course Outcomes of CSE Department

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	**BTPH101 Engineering Physics**	COUT1: Students will be able to understand the various concepts of Engineering Physics effectively and will be able to solve the engineering problems. COUT2: Students will be able to interpret EM wave theory and magnetic material. COUT3: Students will be able to interpret EM wave theory and magnetic materials. COUT4: Students will be able to analyse dispersion effects of fiber optics. COUT5: Students will be able to apply the concept of EM waves in waveguides and antennas. COUT6: Students can design a laser useful in engineering.
2.	**BTPH102 Engineering Physics Lab**	COUT1: The Students will be able to understand the various concepts of Engineering Physics effectively and will be able to understand various characteristics of laser beam. COUT2: Students will be able to interpret magnetic materials and dispersion effects of fibre optics. COUT3: Students will be able to analyze polarization of dielectric material. COUT4: Students will able to apply concept of refractive index of a material. COUT5: Students can design a laser useful in engineering field.
3.	**BTAM101 Engineering Mathematics-1**	COUT1: Students should be able to define partial derivative functions. COUT2: Students should be able to explain vector calculus techniques and different solenoidal and irrotational vector point functions. COUT3: Students should be able to apply integration techniques to calculate area and volume of any solid. COUT4: Students should be able to apply Gauss Divergence, Green's and Stoke's theorem to open and closed surfaces. COUT5: Students should be able to evaluate multiple integral functions.

4.	**BTHU-101 Communicative English**	COUT1: Students should be able to speak in English, in real life situation. COUT2: Students should inculcate reading habits and gain effective reading skills. COUT3: Students should learn more on active and passive vocabulary. COUT4: Students should develop listening skills for academic and professional purpose. COUT5: Students should be able to comprehend scientific and technical English. COUT6: Students should develop writing skills to prepare CVs, letters and reports in formal and business situations. COUT7: Students should be able to analyze and interpret engineering problems expressed in English.
	BTHU-102 Communicative English Lab	COUT1: Students should be able to speak in English, in real life situations. COUT2: Students should develop listening skills for academic and professional purpose. COUT3: Students should be able to comprehend scientific and technical English. COUT4: Students should be able to analyze and interpret engineering problems expressed in English.
5.	**BTEE101 Basic Electrical and Electronics Engineering**	COUT1: Students should be able to define the fundamental knowledge of DC and AC circuits. COUT2: Students should be able to understand the magnetic circuits concepts and learn the working of transformer, electrical machines etc. COUT3: Students should be able to analyze RL, RC and RLC circuits for ac and dc. COUT4: Students should be able to design the various logic gate and flip flops.

		COUT5: Students should be able to apply the Kirchhoff's law and others in solving electrical circuits. COUT6: Students should be able to evaluate the characteristics of Transistors, BJT's, FET's etc. which would be the foundations of today's and tomorrow's.
	BTEE102 Basic Electrical and Electronics Engineering Lab	COUT1: Students will be able define the fundamental s of DC and AC circuits with Ohm's law and Kirchhoff's laws. COUT 2: Students will be able to interpret the various measuring equipments such as multimeter and LVDT. COUT3: Students can analyze the power factor of RL circuit and resonance of series and parallel RLC circuit. COUT4: Students can design and verify the various logic gates and rectifiers. COUT5: Students can apply the Kirchhoff's law and others in solving electrical circuits. COUT6: The Students can evaluate the characteristics of Transistors, CE and CB configuration and PN junction diode.
6.	**HVPE-101 Human Values & Professional Ethics**	COUT1: Students should be able to discriminate between valuable and superficial in life. COUT2: Students should be able to develop the critical ability to distinguish between essence and form. COUT3: Students should be able to describe sensitivity and awareness leading to commitment and courage to act on their own belief. COUT4: Students should be able to become aware of Self exploration- to know what we are and what we really want to be. COUT5: Students should be able to become aware regarding the importance of Sanyama and Swasthya in life. COUT6: Students should be able to know the ways to achieve harmony in self, family, society and nature. COUT7: Students should be able to summarize the importance of professional ethics in different walks of life especially for engineers.
7.	**BTMP101 Manufacturing Practice**	COUT1: Students will describe actual working of various types of tools & equipments used in workshops as well as gain knowledge of design.

		COUT2: Students will be identified and select the appropriate tools required to perform marking out tasks also recognize how to work as an individual as well as a team. COUT3: Students will be able to operate different processes like welding, machining etc. COUT4: Students will be able to analyze different safety measures required while working. COUT5: Students will design different jobs in workshops. COUT6: Students will evaluate different failures in job, after job is made.
8.	**BTAM 102 Engineering Mathematics-II**	COUT1: Students should be able to define linear ordinary differential equations to electric R-L-C circuits, Deflection of beams, Simple harmonic motion, Simple population model. COUT2: Students should be able to describe the basic concepts of linear algebra. COUT3: Students should be able to compare and analyze different tests of convergence. COUT4: Students should be able to evaluate the elementary functions of complex variables and distinguish between their real and imaginary parts.
9.	**BTCH-101 Engineering Chemistry**	COUT1: Students should be able to describe the various techniques of spectroscopy and its application COUT2: Students should be able to classify the law of photochemistry and various applications like semiconductor photochemistry including photovoltaic cell and optical sensors. COUT3: Students should be able to discuss the different problems related to boilers in industry and should be able to suggest solutions for the same. COUT4: Students should be able to analyze green chemistry to make the industrial and engineering processes.

		COUT5: Students should be able to generalize various conversion processes for production of ethylene and propylene COUT6: Students should be able to memorize the mechanism of corrosion and prevention methods. COUT7: Students should be able to categorize the basics of fuel like natural gas, natural gas liquid and crude oil COUT8: Students should be able to define nano-chemistry and its future prospective
	BTCH-102 Engineering Chemistry Lab	COUT1: Students should gain an appreciation of the scientific discipline of chemistry and the principles used by chemists to solve complex problems. COUT2: Students should be able to identify different problems and will be able to suggest possible solutions for the same in industry. COUT3: Students should be able to apply the various practical skills to solve the technical problems. COUT4: Students should be able to analyze the importance of modern chemistry for technical improvements.
10.	**BTME-101 Elements of Mechanical Engineering**	COUT1: Student should be able to define the basics of thermodynamics, types of engineering materials, centre of gravity and moment of inertia. COUT2: Student should be able to understand the basic operation of devices based on flow processes. i.e. turbines, compressor, heat/IC engines etc. COUT3: Student should be able to solve the problems related to basics of thermodynamics, centroid, centre of gravity and moment of inertia. COUT4: Student should be able to compare the working of 2 stroke and 4 stroke engines.
11.	**BTCS101 Fundamentals of Computer Programming and IT**	COUT1: Student should be able to attain knowledge of basic computer operations. COUt2: Student should be able to use Microsoft word and can use it for productivity and for their personal use. COUT3: Student should be able to work with spreadsheets, report's generation and perform calculations by using Microsoft Excel. COUT4: Student should be able to Prepare presentations, Slide shows by using Microsoft Power point features.

		COUT5: Student should be able to attain sufficient knowledge of program planning and problem solving tools like algorithm, pseudo-code and flowcharts COUT6: Student should be able to describe basic C++ features. COUT7: Student should be able to design programs to implement basic concepts by using C++ programming language.
	BTCS102 Fundamentals of Computer Programming and IT Lab	COUT1: Students should be able to understand the basics of computers and technology COUT2: Students should be able to work with MS Office COUT3: Students should be able to design and develop basic programs in C language. COUT4: Students should be able to apply operations on range of cells using built in formulae COUT5: Students should be able to create email account, sending mails, receiving mails, sending files a attachments, etc.
12.	**BTME 102 Engineering Computer Graphic Laboratory**	COUT1: Students will be able to define points, line, plane and solids. COUT2: Students will be able to understand the orthographic and isometric view of various objects. COUT3: Students will be able to analyze the sectional view of solids. COUT4: Students will be able to draw the various mechanical components. COUT5: Students will be able to evaluate the two and three dimensional views of object.
13.	**EVSC-101 Environmental Science**	COUT1: Students should be able to attain knowledge of components of environment and multidisciplinary nature of the subject. COUT2: Students should be able to get awareness regarding importance, types and conservation of natural resources. COUT3: Students should be able to get an overview of structure and function of ecosystem as well as the deep knowledge of biodiversity, its importance for mankind and conservation techniques. COUT4: Students should be able to analyze the types and causes of pollution, solid waste management, nuclear waste and e waste and how to deal with natural disasters. COUT5: Students should be able to get clear idea of sustainable development, various strategies to conserve water such as

		watershed management and rainwater harvesting, value education, human rights and environmental ethics. COUT6: Students should be able to get aware of population related problems in India and various programmes launched by Indian government related to population and environment protection.
14.	**BTME102 Engineering Drawing**	COUT1: Students should be able to state about drawing equipment and use of instruments. Symbols and conventions in drawing Practice. Types of lines & BIS codes. Dimensioning. COUT2: Students should be able to describe Concepts & types of lettering. COUT3: Student should be able to construct plain & diagonal scales. COUT4: Students should be able to solve the problems of Projection of points, projection lines, projection of planes and projection solids. COUT5: Students should be able to draw & develop Section of solids, intersection, development of surfaces, COUT6: Students should be able to draw and judge Isometric projection, orthographic projection and missing lines of simple solids/blocks.
1.	**BTCS301 Computer Architecture**	COUT1: Students should be able to have the knowledge of the computer registers and instructions for designing a basic computer system. COUT2: Students should be able to have a comprehend idea about the register transfer languages and operations for designing of a complete basic computer and it's working. COUT3: Students should be to apply the knowledge of input-output organisation and different modes of data transfer. COUT4: Students should be able to analyze the design of a pipelined CPU and the concept of Parallel processing. COUT5: Students should be able to learn about the designing of different types of control units. Students should be able to learn about the architecture of CPU, general register organization and stack organization. COUT6: Students should be able to analyze and evaluate the memory hierarchy performance.
2.	**BTAM302 Mathematics-III**	COUT1: Students should be able to define numerical techniques. COUT2: Students should able to explain the graphical representation of sine and cosine functions.

		COUT3: Students should be able to solve differential equations and real life problems with the help of numerical methods COUT4: Students should able to compare functions of real variables and complex variables. COUT5: Students should be able to develop an idea about the convergence of solution of heat equation, wave equation in one dimension and two dimension. COUT6: Students should able to judge the complexity of differential equation whether it is solve by ordinary method or with the help of Laplace transforms.
3.	**BTCS303 Digital Circuit and Logic Design**	COUT1: Students should be able to define the basis of digital circuits like number system and Boolean algebra. COUT2: Students should be able to describe the logic gates and their implementations. COUT3: Students should be able to solve algebraic manipulation/simplifications, and application of De-Morgans Theorem. COUT4: Students should be able to design combinational circuits and sequential circuits. Students should be able to classify memories, organization and their implementation. Cout5: Students should be able to do signal conversions i.e. from analog to digital and vice versa.
4.	**BTCS308 Digital Circuit and Logic Design Lab**	COUT1: Students should be able to get practical knowledge about the operation of logic gates. COUT2: Students should be able to get practical knowledge about the operation of half/ full adder and half/ full subtractor. COUT3: Students should be able to get practical knowledge about the operation of Multiplexer and Demultiplexer. COUT4: Students should be able to get practical knowledge about the operation of JK Flip Flop and D Flip Flop.
5.	**BTCS304 Data Structures**	COUT1: Students should be able to describe the usage of various data structures. COUT2: Students should be able to design simple algorithms for solving computing problems. COUT3: Students should be able to choose appropriate data structure as applied to specified problem definition. COUT4: Students should be able to apply operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.

		COUT5: Students should be able to identify the associated algorithms operations and complexity. COUT6: Students should be able to develop computer programs to implement different data structures and related algorithms. COUT7: Students should be able to discuss the computational efficiency of the principal algorithms for sorting, searching and hashing.
6.	**BTCS306 Data Structures Lab**	COUT1: Students should able to design and apply appropriate data structure using simple algorithms for modeling and solving given computing problems. COUT2: Students should able to Understand and implement the both array based and linked-list based data structures, including singly, doubly, and circular linked-lists. COUT3: Students should able to Understand and implement the Stack data structure and stack operations. COUT4: Students should able to Understand and implement the both array based circular queue and linked-list based queue implementations. COUT5: Students should able to Understand and implement general tree data structures, including binary tree, both array based and reference based implementations.
7.	**BTCS305 Object Oriented Programming using C++**	COUT1: Students should be able to define the essential features and elements of the C++ programming language. COUT2: Students should be able to describe the concepts of class, object, function, constructor, instance, data abstraction, function abstraction, inheritance, overriding, overloading, and polymorphism. COUT3: Students should be able to solve various real world computing problems based on the concept of object oriented programming. COUT4: Students should be able to design programs using memory allocation and de-allocation procedures. COUT5: Students should be able to design Templates and use them in various programming languages. COUT6: Students should be able to design programs that can handle exceptions.
8.	**BTCS309 Object Oriented**	COUT1: Students should be able to construct programs using classes and objects. COUT2: Students should be able to create programs using constructors, destructors and initializer list.

	Programming using C++ Lab	COUT3: Students should be able to develop operator overloading and type casting programs. COUT4: Students should be able to demonstrate inheritance, polymorphism. COUT5: Students should be able to design Templates and manipulation of files. COUT6: Students should be able to formulate file handling.
9.	**BTCS307 Institutional Practical Training**	COUT1: Students should be able to Identify, formulate and analyze complex engineering problem. COUT2: Students should be able to apply their knowledge and skills to IT environments COUT3: Students should be able to use computing and IT tools to improve efficiency and accuracy. COUT4: Students should be able to use softwares which are 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.
10.	**BTCS401 Operating System**	COUT1: Students should be able to define the basic concepts of operating system, its roles and functions, views and architecture. COUT2: Students should be able to describe the management activities of operating system such as process, memory, and file and device management. COUT3: Students should be able to solve various scheduling algorithms, deadlock related issues and apply algorithms to avoid deadlocks and will be able to construct page replacement algorithms. COUT4: Students should be able to analyze memory and device management strategies, compare and contrast paging and segmentation, analyze the need of virtual memory, protection and security. COUT5: Students should be able to design and develop various techniques to solve problems related to process and memory management. COUT6: Students should be able to evaluate various case studies of LINUX/ UNIX and windows based operating systems.
11.	**BTCS406 Operating System Lab**	COUT1: Students should be able to get practical knowledge of partitioning a hard disk, formatting and installation of windows xp. COUT2: Students should be able to install VMWare software and to create a virtual machine by installing Linux on VMWare.

		COUT3: Students should be able to get knowledge about various Linux commands. COUT4: Students should be able to get knowledge about shell programming basics and should be able to create shell programs.
12.	**BTCS402 Discrete Structure**	COUT1: Students should be able to define the concepts of sets, relations and functions. COUT2: Students should be able to describe concepts of counting by permutations and combinations. COUT3: Students should be able to solve various types of recurrence relations with the help of generating functions. COUT4: Students should be able to apply the concept of logical equivalence and its relationship to logic circuits and Boolean functions. COUT5: Students should be able to analyze the concepts of graph theory to provide solutions for shortest path applications in computer networks.
13.	**BTCS403 Computer Network-1**	COUT1: Students Should be able to describe various network types. COUT2: Students should be able to explain flow control and buffering techniques and TCP/IP Protocols. COUT3: Students should be able to explain various cables used in Networking. COUT4: Students should be able to describe various protocols like ALOHA and CSMA. COUT5: Students should be able to define World Wide Web (WWW), Domain Name System (DNS), E-mail, File Transfer Protocol (FTP), Introduction to Network security COUT6: Students should be able to use various error correction and detection methods. COUT7: Students should be able to compare and analyze various congestion control and routing Algorithms
14.	**BTCS407 Computer Network-I Lab**	COUT1: Students should be able to Know and Apply pieces of hardware and software to make networks more efficient, faster, more secure, easier to use, able to transmit several simultaneous messages, and able to interconnect with other networks. COUT2: Students should be able to Differentiate the various types of network configurations and applying them to meet the changing and challenging networking needs of organizations. COUT3: Students should be able to define the different protocols, software, and network architectures.

15.	**BTCS404 Microprocessor and Assembly Language Programming**	COUT1: Students should be able to recognise basic concepts of microprocessor and assembly language programming. COUT2: Students should be able to describe the architecture of the Intel 8085, 8251,8255, 8086,Motorola 68000 and Pentium microprocessor and its various applications COUT3: Students should be able to use the various instructions & data formats and addressing modes like data transfer operations, arithmetic operations, logical operations and branch operations of 8085 and 8086 microprocessors. COUT4: Students should be able to develop the simple arithmetic and logical programs with the help of 8085 and 8086 microprocessor kit COUT5: Students should be able to work with seven segment LED, MCTS, traffic light system and stepper motor controller.
16.	**BTCS408 Microprocessor and Assembly Language Lab**	COUT1: Students should be able to understand the basics of multiprocessor about what a microprocessor is and how it works. COUT2: Students should be able to understand the major components of microprocessor include memory (RAM & ROM), I/O devices and communication buses, and its purpose. COUT3: Students should be able to understand the numbering system, instruction sets and various languages used in microprocessor. COUT4: Students should be able to perform the primary calculations such as addition, subtraction, multiplications and complement using microprocessor.
17.	**BTCS405 System Programming**	COUT1: Students should be able to describe various system programs. COUT2: Students should be able to assimilate as to how system programs like assemblers and compilers are able to translate source code. COUT3: Students should be able to create programs in labs to implement some data structures and algorithms behind system programs like assemblers and compilers. COUT4: Students should be able select appropriate system-program design strategies to implement specific system software example weather to use single pass or two pass for assembler. COUT5: Students should be able to design and implement system software.
18.	**BTCS409**	COUT1: Students should have a good knowledge of System programming tasks of a system programmer.

	System Programming Lab	COUT2: Students should design the methods of developing system level software (e.g., compiler, and networking software) COUT3: Students should use the knowledge and techniques learnt to develop solutions to real world problems
19.	**BTCS501 Computer Networks-II**	COUT1: Students should be able to define network security aspects and network security attacks. COUT2: Students should be able to define cellular radio concepts such as frequency reuse, hand-off, interference between mobile and base station and capacity of cellular system. COUT3: Students should be able to explain Internet key exchange, simple key management protocol, photuris. COUT4: Students should be able to use modern engineering tool to capture the network traffic. COUT5: Students should be able to compare and analyze IPV4 and IPV6. COUT6: Students should be able to analyze the different routing and MAC protocols of wireless mobile ad hoc network COUT7: Students should be able to learn and design the wireless communication system, 2G cellular system, and 3G cellular systems.
20.	**BTCS507 Computer Networks-II Lab**	COUT1: Students should be able to configure local area network using IPv4 and IPV6. COUT2: Students should be able to implement wireless ad hoc networks. COUT3: Students should be able to apply knowledge and interpret the working of packet capture software wireshark. COUT4: Students should be able to configure wireless local loop, wireless access point and wireless local area network. COUT5: Students should be able to create personal area network. COUT6: Students should be able to set up VMware and NS2.
21.	**BTCS502 Relational Database Management System**	COUT1: Students should be able to identify fundamental concepts and techniques of related database management, databases technology, why database are used and the basic components of a database. COUT2: Students should be able to recognize the relational model and define key relational terminology and principles COUT3: Students should be able to demonstrate the use of structured query Language, an international standard for creating and processing relational databases.

		COUT4: Students should be able to describe Data modeling and the entity- relationship model and demonstrate their understanding of these two types of models. COUT5: Students should be able to transform data model into a relational database design. COUT6: Students should be able to recognize and discuss the components and responsibilities of database management.
22.	**BTCS506 Relational Database Management System lab**	COUT1: Students should be able to understand installation of SQL Server, Data types and various SQL statements. COUT2: Students should be able to understand Aggregate Functions, Nested Queries, Joins, and Sequences. COUT3: Students should Be able to understand Database Security and Privileges and Referencing Non-SQL parameters COUT4: Students should be able to understand Stored Procedures and Exception Handling and Cursor Management in PL/SQL
23.	**BTCS503 Design and Analysis of Algorithms**	COUT1: Students should be able to select the algorithm designing techniques with respect to the problem defined. COUT2: Students should be able to predict the complexities of the program prior to the execution. COUT3: Students should be able to prove the correctness and analyze the running time of the basic algorithms for those classic problems in various domains COUT4: Students should be able to gain an understanding of contemporary algorithmic techniques. COUT5: Students should be able to analyze the complexities of various problems in different domains. COUT6: Students can acquire a broad education necessary to analyze the local and global impact of algorithmic solutions on individuals, organizations, and society.
24.	**BTCS508 Design and Analysis of Algorithms Lab**	COUT1: Students should be able to construct programs using algorithms for sorting arrays. COUT2: Students should be able to create programs for different searching techniques. COUT3: Students should be able to formulate the complexity of algorithms. COUT4: Students should be able to develop programs for different shortest path techniques. COUT5: Students should be able to design the stack and queues searching methods.

25.	**BTCS504 Computer Graphics**	COUT1: Students should be able to understand basics of a computer graphics system. COUT2: Students should be able to understand difference between raster- scan and random-scan system. COUT3: Students should be able to assimilate various algorithms to implement a raster-scan graphics package. COUT4: Students should be able to gain broad knowledge of various graphics standards. COUT5: Students should be able to implement small programs to understand how various algorithms are used to implement a raster- scan graphics package.
26.	**BTCS509 Computer Graphics Lab**	COUT1: Students should be able to work in C++ graphics system. COUT2: Students should be able to implement basic raster-scan graphics algorithms. COUT3: Students should be able to implement 2-D geometric transformations for various graphics problems. COUT4: Students should be able to implement viewing transformations for various graphics problems.
27.	**BTCS505 Computer Peripherals & Interfaces**	COUT1: Students should be able to understand the basics concept of various peripherals devices. COUT2: Students should be able to Explain different memory and storage devices in computer peripherals, Various parallel and serial interface protocols and various communication protocols/interfacing and bus systems. COUT3: Students should be able to compare and put specification of computer/peripherals.. COUT4: Students should be able to perform installation configuration and upgrading of various peripherals devices. COUT5: Students should be able to be familiar with the different types of interrupt structures. Students should be able to Diagnose and troubleshoot problems with microcomputer peripherals.
28.	**BTCS510 Industrial 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 softwares which are 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.
29.	**BTCS601 Simulation & Modeling**	COUT1: Students should be able to describe the basic concepts of simulation, its advantages and disadvantages. COUT2: Students should be able to discuss the various principles of simulation. COUT3: Students should be able to apply the key principles of statistical models in simulation. COUT4: Students should be able to describe the application of queuing models. COUT5: Students should able to compare and contrast the various system designs. COUT6: Students should be able to analyze the output data of single model. COUT7: Students should be able to simulate the computer network system.
30.	**BTCS607 Simulation & Modelling Lab**	COUT1:Students should be able to describe the basics of MATLAB Environment COUT2:Students should be able to classify the Data types COUT3:Students should be able to employ the implementation of loops, branching statements, control structures COUT4:Students should be able to outline the requirements to plot graphs
31.	**BTCS602 Relational Database Management System-II**	COUT1: Students should be able to apply normalization to the database. COUT2: Students should be able to analyze the basic query processing and discuss optimization techniques for high level query. COUT3: Students should be able to describe different transaction processing concepts and exemplify different concurrency control techniques. COUT4: Students should be able to categories different types of databases such as object oriented and distributed databases. COUT5: Students should be able to differentiate different types of database failures and techniques to recover from such failures. COUT6: Students should be able to use data mining tool for finding various patterns from database. COUT 7: Students should be able to compare various database.
32.	**BTCS604**	COUT1: Students should be able to implement the concept of normalization.

	Relational Database Management System-II Lab	COUT2: Students should be able to use query optimization techniques. COUT3: Students should be able to gain knowledge of backup and recovery features of database management software. COUT4: Students should be able to describe the duties of server administration of database management. COUT5: Students should be able to use object oriented relational database COUT6: Students should be able to implement the weka tool for data mining COUT7: Students should be able to describe web databases.
33.	**BTCS603 Software Engineering**	COUT1: Students should be able to understand the basics of S/W engineering. COUT2: Students should be able to classify the various models. COUT3: Students should be able to apply the concept of project management. COUT4: Students should be able to analyze the software using various testing methods. COUT5: Students should be able to do quality control. COUT6: Students can evaluate the Software Engineering process for the software system.
34.	**BTCS606 Software Engineering Lab**	COUT1: Students should be able to analyses and develop core skills that gives students the ability to successfully complete their planning problems COUT2: Students should be able to manage the project effectively so that completion of project must be achieved in time. COUT3: Students should be able to apply reasoning informed by contextual knowledge and the consequent responsibilities relevant to professional engineering practice COUT4: Students should be able to measure the quality, cost and effectiveness of the project and the processes. COUT5: Students should be able to generate effective report and design documentation, make effective presentations COUT6: Students should be able to analyses and develop core skills that gives students the ability to successfully complete their planning problems
35.	**BTCS605**	COUT1: Students should be able to describe the basics of Information Security

	Free/Open Source Sofwtare Lab	COUT2: Students should be able to describe the Classical Encryption techniques COUT3: Students should be able to employ the implementation of Encryption techniques COUT4: Students should be able to analyse the techniques to secure information COUT5: Students can categorize various information sharing methods and their threats COUT6: Students should be able to select the various secure transmission mechanisms
36.	**BTCS904 Information Security (Elective 1)**	COUT1: Students should be able to describe the basics of Information Security. COUT2: Students should be able to classify the Classical Encryption techniques. COUT3: Students should be able to employ the implementation of Encryption techniques. COUT4: Students should be able to outline the requirements to secure information. COUT5: Students should be able to categorize various information sharing methods and their threats. COUT6: Students should be able to select the various secure transmission mechanisms.
37.	**HU-251 Human Resource Management (Open Elective)**	COUT1: Students should be able to attain knowledge of human resource functions within organizations. COUT2: Students should be able to summarize and restate the current issues, trends, practices, and processes in HRM. COUT3: Students should be able to discuss the Problem related to human resource challenges. COUT4: Students should be able to analyze the effective written and oral communication skills. COUT5: Students should be able to generalize various aspects of integration and maintenance function of HRM
38.	**BTCS701 Artificial Intelligence**	COUT1: Students should be able to describe the basic concepts of Artificial Intelligence. COUT2: Students should be able to design heuristic functions for various problem types. COUT3: Students should be able to select appropriate search strategy for a given search COUT4: Students should be able to describe planning techniques for AI problems.

		COUT5: Students should be able to represent knowledge using propositional logic predicate logic, belief networks, Bayesian networks, decision trees, neural networks etc.
39.	**BTCS704 Artificial Intelligence Lab**	COUT1: Students should be able to demonstrate working knowledge in Lisp in order to write simple Lisp programs and explore more sophisticated Lisp code on their own COUT2: Students should be able to apply knowledge representation, reasoning, and machine learning techniques to real-world problems COUT3: Students should be able to know how to build simple knowledge-based systems. COUT4: Students should be able to develop various expert systems and solving real world problems.
40.	**BTCS702 Theory of computation**	COUT1: Students should be able to assimilate basic of automata and grammars. COUT2: Students should be able to summarize the deterministic and nondeterministic finite automata COUT3: Students should be capable of classifying Context free languages and Normalizing CFG. COUT4: Students should be able to efficiently analyze Decidability and recursively Enumerable languages. COUT5: Students should be able to understand and design the Turing machine, PCP problem and Halting Problems.
41.	**BTCS703 Project**	COUT1: Students should be able to analyses and develop core skills that gives students the ability to successfully complete their planning problems COUT2: Students should be able to manage the project effectively so that completion of project must be achieved in time. COUT3: Students should be able to apply reasoning informed by contextual knowledge and the consequent responsibilities relevant to professional engineering practice COUT4: Students should be able to measure the quality, cost and effectiveness of the project and the processes. COUT5: Students should be able to generate effective report and design documentation, make effective presentations

42.	**BTCS-906 Object Oriented Analysis and Design**	COUT1: Students should be able to know about object oriented systems and its concepts- classes, objects, abstraction, inheritance etc. COUT2: Students should learn about Iterative and incremental development approach of software development, the unified process and its phases COUT3: Students should be able to know about UML and various concepts and diagrams of UML in detail. COUT4: Students should be able to know about various design patterns- GoF and GRASP, their types and also about anti patterns. COUT5: 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. COUT6: Students should be able to know about aspect oriented and service oriented approach of software development.
43.	**BTCS912 Cloud Computing**	COUT1: Students should be able to describe the basics of Cloud Computing COUT2: Students should be able to interprets, the Cloud service delivery models. COUT3: Students should be able apply the Cloud Computing methodology in IT. COUT4: Students should be able to analyze the Security in Cloud Computing. COUT5: Students should be able to identify the Cloud deployment Scenarios. COUT6: Students should able to designs the theoretical concepts learned by studying sufficient number of Case Studies.
44.	**BTCS802 Software Training**	COUT1: Students should be able to define compelling and viable problems COUT2: Students should be able to develop skills to create practical solutions to identified problem. COUT3: Students should be able to use software lifecycle model and other artifacts appropriate for problem COUT4: Students should be able to identify and master tools required for the project COUT5: Students should be able to plan and work systematically towards completion of a project work.

		COUT6: Students should be able to develop the ability to explain and defend their work in front of an evaluation panel
45.	**BTCS802 Industry oriented Project Training**	COUT1: Students should be able to apply knowledge of mathematics, science, engineering fundamentals and engineering specialization to the solution of complex engineering problems. COUT2: Students should be able to apply their knowledge and skills relevant to their area of study on real world scenario. COUT3: Students should be able to relate the knowledge and skills acquired at the workplace, to their on-campus studies. COUT4: Students should be able to compete effectively in the job market by their requisite knowledge, skills, attitudes and practical experience. COUT5: Students should be able to take decisions on industrial environment. COUT6: Students should be able to work in teams, both as a member and as a leader, appreciates participatory roles, develops skills in inter-personal dealings

Course Outcomes of CSE Department (2018 Onwards)

Course Outcomes CSE

1.	**BTAM304-18 Mathematics-III**	COUT1: Students should be able to define numerical techniques. COUT2: Students should able to explain the graphical representation of sine and cosine functions. COUT3: Students should be able to solve differential equations and real life problems with the help of numerical methods COUT4: Students should able to compare functions of real variables and complex variables. COUT5: Students should be able to develop an idea about the convergence of solution of heat equation, wave equation in one dimension and two dimension. COUT6: Students should able to judge the complexity of differential equation whether it is solve by ordinary method or with the help of Laplace transforms.
2.	**BTES301-18 Digital Electronics**	COUT1: Students should be able to define the basis of digital circuits like number system and Boolean algebra. COUT2: Students should be able to describe the logic gates and their implementations. COUT3: Students should be able to solve algebraic manipulation/simplifications, and application of De-Morgans Theorem. COUT4: Students should be able to design combinational circuits and sequential circuits.

		Students should be able to classify memories, organization and their implementation. Cout5: Students should be able to do signal conversions i.e. from analog to digital and vice versa.
	BTES 302-18 Digital Electronics Lab	COUT1: Students should be able to get practical knowledge about the operation of logic gates. COUT2: Students should be able to get practical knowledge about the operation of half/ full adder and half/ full subtractor. COUT3: Students should be able to get practical knowledge about the operation of Multiplexer and Demultiplexer. COUT4: Students should be able to get practical knowledge about the operation of JK Flip Flop and D Flip Flop.
3.	**BTCS301-18 Data Structure and ALGORITHMS**	COUT1: Students should be able to describe the usage of various data structures. COUT2: Students should be able to design simple algorithms for solving computing problems. COUT3: Students should be able to choose appropriate data structure as applied to specified problem definition. COUT4: Students should be able to apply operations like searching, insertion, deletion, traversing mechanism etc. on various data structures. COUT5: Students should be able to identify the associated algorithms operations and complexity. COUT6: Students should be able to develop computer programs to implement different data structures and related algorithms. COUT7: Students should be able to discuss the computational efficiency of the principal algorithms for sorting, searching and hashing.
	BTCS303-18 Data Structure and ALGORITHMS	COUT1: Students should able to design and apply appropriate data structure using simple algorithms for modeling and solving given computing problems. COUT2: Students should able to Understand and implement the both array based and linked-list based data structures, including singly, doubly, and circular linked-lists. COUT3: Students should able to Understand and implement the Stack data structure and stack operations. COUT4: Students should able to Understand and implement the both array based circular queue and linked-list based queue implementations. COUT5: Students should able to Understand and implement general tree data structures, including binary tree, both array based and reference based implementations.

4.	**BTCS302-18 Object Oriented Programming**	COUT1: Students should be able to define the essential features and elements of the C++ programming language. COUT2: Students should be able to describe the concepts of class, object, function, constructor, instance, data abstraction, function abstraction, inheritance, overriding, overloading, and polymorphism. COUT3: Students should be able to solve various real world computing problems based on the concept of object oriented programming. COUT4: Students should be able to design programs using memory allocation and de-allocation procedures. COUT5: Students should be able to design Templates and use them in various programming languages. COUT6: Students should be able to design programs that can handle exceptions.
	BTCS304-18 Object Oriented Programming Lab	COUT1: Students should be able to construct programs using classes and objects. COUT2: Students should be able to create programs using constructors, destructors and initializer list. COUT3: Students should be able to develop operator overloading and type casting programs. COUT4: Students should be able to demonstrate inheritance, polymorphism. COUT5: Students should be able to design Templates and manipulation of files. COUT6: Students should be able to formulate file handling.
5.	**HSMC 101-18 Foundation Course in Humanity**	COUT1: Students should be able to attain knowledge of human resource functions within organizations. COUT2: Students should be able to summarize and restate the current issues, trends, practices, and processes in HRM. COUT3: Students should be able to discuss the Problem related to human resource challenges. COUT4: Students should be able to analyze the effective written and oral communication skills. COUT5: Students should be able to generalize various aspects of integration and maintenance function of HRM
6.	**Summer Institutional Training**	COUT1: Students should be able to Identify, formulate and analyze complex engineering problem. COUT2: Students should be able to apply their knowledge and skills to IT environments COUT3: Students should be able to use computing and IT tools to improve efficiency and accuracy. COUT4: Students should be able to use softwares which are 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.

7.	**BTES401-18 Computer Architecture**	COUT1: Students should be able to have the knowledge of the computer registers and instructions for designing a basic computer system. COUT2: Students should be able to have a comprehend idea about the register transfer languages and operations for designing of a complete basic computer and it's working. COUT3: Students should be to apply the knowledge of input-output organization and different modes of data transfer. COUT4: Students should be able to analyze the design of a pipelined CPU and the concept of Parallel processing. COUT5: Students should be able to learn about the designing of different types of control units. Students should be able to learn about the architecture of CPU, general register organization and stack organization. COUT6: Students should be able to analyze and evaluate the memory hierarchy performance.
8.	**BTES401-18 Computer Architecture Lab**	COUT1:Assemble personal computer; COUT2. Implement the various assembly language programs for basic arithmetic and logical operations; COUT3.Demonstrate the functioning of microprocessor/microcontroller based systems with I/O interface.
9.	**BTCS402-18 Operating System**	COUT1: Students should be able to define the basic concepts of operating system, its roles and functions, views and architecture. COUT2: Students should be able to describe the management activities of operating system such as process, memory, and file and device management. COUT3: Students should be able to solve various scheduling algorithms, deadlock related issues and apply algorithms to avoid deadlocks and will be able to construct page replacement algorithms. COUT4: Students should be able to analyze memory and device management strategies, compare and contrast paging and segmentation, analyze the need of virtual memory, protection and security. COUT5: Students should be able to design and develop various techniques to solve problems related to process and memory management. COUT6: Students should be able to evaluate various case studies of LINUX/ UNIX and windows based operating systems.

	BTCS404-18 Operating System Lab	COUT1: Students should be able to get practical knowledge of partitioning a hard disk, formatting and installation of windows xp. COUT2: Students should be able to install VMWare software and to create a virtual machine by installing Linux on VMWare. COUT3: Students should be able to get knowledge about various Linux commands. COUT4: Students should be able to get knowledge about shell programming basics and should be able to create shell programs.
10.	**BTCS401-18 Discrete Structure**	COUT1: Students should be able to define the concepts of sets, relations and functions. COUT2: Students should be able to describe concepts of counting by permutations and combinations. COUT3: Students should be able to solve various types of recurrence relations with the help of generating functions. COUT4: Students should be able to apply the concept of logical equivalence and its relationship to logic circuits and Boolean functions. COUT5: Students should be able to analyze the concepts of graph theory to provide solutions for shortest path applications in computer networks.
11.	**HSMC 122-18 Foundation Course in Humanity-II**	COUT1: Students should be able to attain knowledge of human resource functions within organizations. COUT2: Students should be able to summarize and restate the current issues, trends, practices, and processes in HRM. COUT3: Students should be able to discuss the Problem related to human resource challenges. COUT4: Students should be able to analyze the effective written and oral communication skills. COUT5: Students should be able to generalize various aspects of integration and maintenance function of HRM
12.	**BTES501-18 Enterprise Resource Planning**	COUT1: Students should be able To know the basics of ERP COUT2: Students should be able to understand the key implementation issues of ERP COUT3: Students should be able to know the business modules of ERP COUT4: Students should be able to T be aware of some popular products in the area of
13.	**BTCS504-18 Computer Network**	COUT1: Students Should be able to describe various network types. COUT2: Students should be able to explain flow control and buffering techniques and TCP/IP Protocols. COUT3: Students should be able to explain various cables used in Networking.

		COUT4: Students should be able to describe various protocols like ALOHA and CSMA. COUT5: Students should be able to define World Wide Web (WWW), Domain Name System (DNS), E-mail, File Transfer Protocol (FTP), Introduction to Network security COUT6: Students should be able to use various error correction and detection methods. COUT7: Students should be able to compare and analyze various congestion control and routing Algorithms
	BTCS507-18 Computer Network	COUT1: Students should be able to Know and Apply pieces of hardware and software to make networks more efficient, faster, more secure, easier to use, able to transmit several simultaneous messages, and able to interconnect with other networks. COUT2: Students should be able to Differentiate the various types of network configurations and applying them to meet the changing and challenging networking needs of organizations. COUT3: Students should be able to define the different protocols, software, and network architectures.
14.	**BTCS404 Microprocessor and Micro controller**	COUT1: Students should be able to recognise basic concepts of microprocessor and assembly language programming. COUT2: Students should be able to describe the architecture of the Intel 8085, 8251,8255, 8086,Motorola 68000 and Pentium microprocessor and its various applications COUT3: Students should be able to use the various instructions & data formats and addressing modes like data transfer operations, arithmetic operations, logical operations and branch operations of 8085 and 8086 microprocessors. COUT4: Students should be able to develop the simple arithmetic and logical programs with the help of 8085 and 8086 microprocessor kit COUT5: Students should be able to work with seven segment LED, MCTS, traffic light system and stepper motor controller.
15.	**BTCS601-18 Compiler Design**	COUT1: Students should be able to describe various system programs. COUT2: Students should be able to assimilate as to how system programs like assemblers and compilers are able to translate source code. COUT3: Students should be able to create programs in labs to implement some data structures and algorithms behind system programs like assemblers and compilers. COUT4: Students should be able select appropriate system-program design strategies to implement specific system software example weather to use single pass or two pass for assembler. COUT5: Students should be able to design and implement system software.

	BTCS604-18 Compiler Design Lab	COUT1: Students should have a good knowledge of System programming tasks of a system programmer. COUT2: Students should design the methods of developing system level software (e.g., compiler, and networking software) COUT3: Students should use the knowledge and techniques learnt to develop solutions to real world problems
16.	**BTCS520-18 Web Technologies**	COUT1: Understand and apply the knowledge of web technology stack to deploy various web services. COUT2: Students should be able to Analyze and evaluate web technology components for formulating web related problems. COUT3: Students should be able to Design and develop interactive client server internet application that accommodates user specific requirements and constraint analysis. COUT4: Program latest web technologies and tools by creating dynamic pages with an understanding of functions and objects.
	BTCS522-18 Web Technologies Lab	COUT1: Students should be able Create XML documents and Schemas. COUT2: Students should be able to Build interactive web applications using AJAX COUT3: Students should be able to Program latest web technologies and tools by creating dynamic pages with an understanding of functions and objects. COUT7: Students should be able to describe web databases.
17.	**BTCS 501-18 Database Management System**	COUT1: Students should be able to identify fundamental concepts and techniques of related database management, databases technology, why database are used and the basic components of a database. COUT2: Students should be able to recognize the relational model and define key relational terminology and principles COUT3: Students should be able to demonstrate the use of structured query Language, an international standard for creating and processing relational databases. COUT4: Students should be able to describe Data modeling and the entity- relationship model and demonstrate their understanding of these two types of models. COUT5: Students should be able to transform data model into a relational database design. COUT6: Students should be able to recognize and discuss the components and responsibilities of database management.

	BTCS505-18 Database Management System lab	COUT1: Students should be able to understand installation of SQL Server, Data types and various SQL statements. COUT2: Students should be able to understand Aggregate Functions, Nested Queries, Joins, and Sequences. COUT3: Students should Be able to understand Database Security and Privileges and Referencing Non-SQL parameters COUT4: Students should be able to understand Stored Procedures and Exception Handling and Cursor Management in PL/SQL
18.	**BTCS403-18 Design and Analysis of Algorithms**	COUT1: Students should be able to select the algorithm designing techniques with respect to the problem defined. COUT2: Students should be able to predict the complexities of the program prior to the execution. COUT3: Students should be able to prove the correctness and analyze the running time of the basic algorithms for those classic problems in various domains COUT4: Students should be able to gain an understanding of contemporary algorithmic techniques. COUT5: Students should be able to analyze the complexities of various problems in different domains. COUT6: Students can acquire a broad education necessary to analyze the local and global impact of algorithmic solutions on individuals, organizations, and society.
	BTCS405-18 Design and Analysis of Algorithms Lab	COUT1: Students should be able to construct programs using algorithms for sorting arrays. COUT2: Students should be able to create programs for different searching techniques. COUT3: Students should be able to formulate the complexity of algorithms. COUT4: Students should be able to develop programs for different shortest path techniques. COUT5: Students should be able to design the stack and queues searching methods.
19.	**Industrial 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 softwares which are 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.

20.	**BTCS618-18 Machine Learning**	CO1: Analyse methods and theories in the field of machine learning CO2: Analyse 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
	BTCS619-18 Machine Learning Lab	CO1: Analyse and extract features of complex datasets CO2: Comprehend and apply different classification and clustering techniques CO3: Understand the concept of Neural Networks and Genetic Algorithm
21.	**BTCS503-18 Software Engineering**	COUT1: Students should be able to understand the basics of S/W engineering. COUT2: Students should be able to classify the various models. COUT3: Students should be able to apply the concept of project management. COUT4: Students should be able to analyze the software using various testing methods. COUT5: Students should be able to do quality control. COUT6: Students can evaluate the Software Engineering process for the software system.
	BTCS506-18 Software Engineering Lab	COUT1: Students should be able to analyses and develop core skills that gives students the ability to successfully complete their planning problems COUT2: Students should be able to manage the project effectively so that completion of project must be achieved in time. COUT3: Students should be able to apply reasoning informed by contextual knowledge and the consequent responsibilities relevant to professional engineering practice COUT4: Students should be able to measure the quality, cost and effectiveness of the project and the processes. COUT5: Students should be able to generate effective report and design documentation, make effective presentations COUT6: Students should be able to analyses and develop core skills that gives students the ability to successfully complete their planning problems
22.	**BTCS602-18 Artificial Intelligence**	COUT1: Students should be able to describe the basic concepts of Artificial Intelligence. COUT2: Students should be able to design heuristic functions for various problem types. COUT3: Students should be able to select appropriate search strategy for a given search COUT4: Students should be able to describe planning techniques for AI problems.

		COUT5: Students should be able to represent knowledge using propositional logic predicate logic, belief networks, Bayesian networks, decision trees, neural networks etc.
	BTCS605-18 Artificial Intelligence Lab	COUT1: Students should be able to demonstrate working knowledge in Lisp in order to write simple Lisp programs and explore more sophisticated Lisp code on their own COUT2: Students should be able to apply knowledge representation, reasoning, and machine learning techniques to real-world problems COUT3: Students should be able to know how to build simple knowledge-based systems. COUT4: Students should be able to develop various expert systems and solving real world problems.
23.	**BTCS502-18 FLAT**	COUT1: Students should be able to assimilate basic of automata and grammars. COUT2: Students should be able to summarize the deterministic and nondeterministic finite automata COUT3: Students should be capable of classifying Context free languages and Normalizing CFG. COUT4: Students should be able to efficiently analyze Decidability and recursively Enumerable languages. COUT5: Students should be able to understand and design the Turing machine, PCP problem and Halting Problems.
24.	**BTCS603-18 Project**	COUT1: Students should be able to analyses and develop core skills that gives students the ability to successfully complete their planning problems COUT2: Students should be able to manage the project effectively so that completion of project must be achieved in time. COUT3: Students should be able to apply reasoning informed by contextual knowledge and the consequent responsibilities relevant to professional engineering practice COUT4: Students should be able to measure the quality, cost and effectiveness of the project and the processes. COUT5: Students should be able to generate effective report and design documentation, make effective presentations
25.	**BTCS613-18 Cloud Computing**	COUT1: Students should be able to describe the basics of Cloud Computing COUT2: Students should be able to interprets, the Cloud service delivery models. COUT3: Students should be able apply the Cloud Computing methodology in IT.

		COUT4: Students should be able to analyze the Security in Cloud Computing. COUT5: Students should be able to identify the Cloud deployment Scenarios. COUT6: Students should able to designs the theoretical concepts learned by studying sufficient number of Case Studies.
26.	**BTCS613-18 Cloud Computing Lab**	COUT1: Students should be able to define compelling and viable problems COUT2: Students should be able to develop skills to create practical solutions to identified problem. COUT3: Students should be able to use software lifecycle model and other artifacts appropriate for problem COUT4: Students should be able to identify and master tools required for the project COUT5: Students should be able to plan and work systematically towards completion of a project work. COUT6: Students should be able to develop the ability to explain and defend their work in front of an evaluation panel

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 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

PEO1 Graduates shall have strong practical and theoretical expertise in Mechanical, allied engineering, mathematics and science and shall opt for employability or higher studies or research or entrepreneurship, either in India or abroad.\

PEO2 Graduates shall have global outlook, technological leadership, creative thinking towards innovation and enterprise to contribute to society.

PEO3 Graduates shall have excellent teamwork, communication, interpersonal skills, high morals and ethical values.

Course Outcomes of ME Department (2011 Onwards)

1.	**BTME-301** **Strength of Materials**	1. Graduates will be able to define stress, strain, bending moment, torsion, column and struts. 2. Graduates will be able to describe graphical relations for ductile and brittle material. 3. Graduates will be able to familiarize with the use of stress, strain, bending moment, torsion, and column and struts. 4. Graduates have able to distinguish column and struts. 5. Graduates have able to solve problem stress, strain, bending moment and shear force, torsion, slope and deflection, column and struts.
	BTME-308 **Strength of Materials Lab.**	1. Students will be able to understand the concepts of stress and strain. 2. Students will be able to identify and solve the stress and strain related problems. 3. Students will be able to compare graphically behavior of ductile material. 4. Students will be able to analysis various critical points in stress strain graph. 5. Students will be able to understand the concept of gradual and impact loading. 6. Students will be able to solve problem by varying nature of loads and evaluate deflection in beams.
2.	**BTME-302** **Theory of Machines**	1. Students will be able to define the basics of kinematic links, kinematic chains and other concepts of kinematics of machines. 2. Students will be able to understand kinetics of machines, theory of belt drives and chain drives. 3. Students will be able analyze the applications of brakes, dynamometers and friction devices. 4. Students will be able analyze and compare belt, rope and chain drives. 5. Students will be able synthesize and design machine elements. 6. Students will be able to evaluate the knowledge gained from kinetics of machines.

3.	**BTME-303** **Machine Drawing**	1. To recall the engineering drawing, drawing instruments and other drawing materials. 2. To discuss the machine, working, detail & assembly drawing. 3. To explain & application of various types machine components/joints/machine symbols. 4. To examine & draw the various types of machine components i.e. Fasteners, couplings, joints, Valves and IC engine parts their SI standards.
4.	**BTME-304** **Applied** **Thermodynamics-1**	1. Students will be able to define and understand various types of thermodynamics process or cycle. 2. Students will be able to explain the working of IC engine, steam generator, nozzle, steam turbine, condenser and cooling tower. 3. Students will be able to solve thermodynamics related problem related in IC engine, steam generator, steam turbine, steam power plant, condenser and cooling tower. 4. Students will be able to distinguish between various types of IC engine, steam generator, steam turbine, condenser and cooling tower. 5. Students will be able to do thermodynamics analysis of various types steam, combustion related problems. 6. Students will be able to evaluate the performance internal combustion engine and various parts in steam power plant.
	BTME-309 **Applied** **Thermodynamics Lab**	1. Students will be able to understand the constructional and valve timing of 4 stroke diesel engine. 2. Students will be able to understand construction mountings and accessories of various types of boilers. 3. 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. 4. Students will be able to understand construction and operation of various types of steam condensers and cooling towers.

5.	**BTME-305 Manufacturing Processes-1**	1. Graduates will be able to define manufacturing process. 2. Graduates will be able to discuss metal casting and welding process. 3. Graduates will be able to familiarize with use of various metal casting and welding process. 4. Graduates will be able to distinguish various metal casting and welding process. 5. Graduates will be able to select various metal casting and welding process.
6.	**BTME-306 Engineering Materials & Metallurgy**	1. Students will be able to name the different types of crystal structure and to define various imperfections in solids. 2. Students will be able to explain iron carbon equilibrium diagram and describe various phase transformations. 3. Students will be able to demonstrate the effects of alloying elements (Si, Mn, Ni, Cr, Mo, W, Al) on the structure. 4. Students will be able to compare different type of phase diagram for binary system like eutectic, peritectic, eutectoid, type. 5. Students will be able to design different alloying elements by using the different types of heat treatment process.
	BTME-307 Engineering Materials & Metallurgy Lab	1. Students will be able to define the various crystal structures. 2. Students will be able to explain the basic concept of heat treatment. 3. Students will be able to apply various methods for the preparation of specimens for microstructure examination. 4. Students will be able to compare different heating temperature and heating time while the heat treatment process. 5. Students will be able to create different mechanical properties by changing the quenching medium while heat treatment processes. 6. Students will be able to judge the ferrite and pearlite constituents in the given specimen.
7.	**BTME-401 Strength of Materials-2**	1. Graduates will be able to define the concepts of strain energy, spring, various cylinders, and stresses in beam. 2. Graduates will be able to describe various theory of failure.

		3. Graduates will be familiarizing the use of strain energy, theories of failure, cylinders, and rotational discs. 4. Graduates will be able to distinguish various theories of failure, thin and thick cylinder. 5. Graduates will be able to solve problems related to strain energy, theories of failure, cylinders, stresses in beams, rotational discs.
8.	**BTME-402** **Theory of Machines-2**	1. Students will be able to define the basics of kinematic links, kinematic chains and other concepts of kinematics of machines. 2. Students will be able to understand kinetics of machines, balancing of masses and design of gears & gear trains. 3. Students will apply various concepts of gyroscopic effect, gears and force analysis. 4. Students will analyze how to design machine components. 5. Graduates will be able to synthesize the kinetics of machines. 6. Students will able to evaluate the knowledge gained from kinetics of machines.
	BTME-408 **Theory of Machines Lab**	1. Students will be able to understand balancing of masses and design of gears and gear trains. 2. Students will gain knowledge of kinematic synthesis and different applications of gyroscopic effect.
9.	**BTME-403** **Fluid Mechanics**	1. Students will be able to define fundamentals of fluid mechanics; fluid static, fluid kinematics, fluid dynamic. 2. Students will be able to explain various types of flows, working of various Pressure and Flow Measurement devices. 3. Students will be able to solve problems related to fluid static, fluid kinematics, fluid dynamic and dimensional analysis. 4. Students will be able to analysis pattern of Flow inside the pipe and over the plate.
	BTME-406 **Fluid Mechanics Lab**	1. Students will be able to recognize the various types of flows. 2. Students will understand the concept of buoyancy, metacentric height and able to find metacentric height.

		3. Students will be able to measure the discharge by Venturimeter, orifice meter and notches and find the coefficients of discharges for them. 4. Students will be able to measure the losses/ friction coefficients in pipe lines at various conditions like sudden expansion, sudden contraction, bend etc.
10.	**BTME-404 Applied Thermodynamics-2**	1. Students will be able to define various types of compressor, gas turbine cycle and jet propulsion system. 2. Students will be able to explain the working of various types of compressors, gas turbine and jet propulsions. 3. Students will understand the uses of compressors, gas turbine and jet propulsion. 4. Students will be able to thermodynamic analysis of various types of compressor, gas turbines and jet propulsions. 5. Students will be able to distinguish between various types of compressor, gas turbines and jet propulsions. 6. Students will be able to evaluate the performance various types of compressor, gas turbines and jet propulsions.
11.	**BTME-405 Manufacturing Processes-2**	1. To be able define the concept of manufacturing. 2. To be able to describe the principle operation and capability of various metal cutting, metal forming and machine tools. 3. To be able to explain the importance of process variables controlling these processes. 4. 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.
	BTME-407 Manufacturing Processes Lab	1. Students will be able to understand the importance of the manufacturing processes. 2. Students will be able to select a suitable metal casting and metal joining processes to fabricate an engineering product.
12.	**BTAM-500 Mathematics-3**	1. Students will be able to define numerical techniques. 2. Students will able to explain the graphical representation of sine and cosine functions. 3. Students will be able to solve differential equations and real life problems with the help of numerical methods.

		4. Students will be able to compare functions of real variables and complex variables. 5. Students will be able to develop an idea about the convergence of solution of heat equation, wave equation in one dimension and two dimensions. 6. 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
13.	**BTME-501 Design of Machine Elements-1**	1. Students will be able to understand the meaning of machine design and various types of machine design processes. 2. 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. 3. Students will be able to apply the design of rigid and flexible coupling for torque transmission. 4. Students will be able to distinguish between various types of cotter and knuckle joints. 5. Students will be able to develop the skill to design different types of transmission shafts, axles, links, levers and pipe joints. 6. Students will be able to judge the effectiveness of various types of design processes.
14.	**BTME-502 Computer aided Design And Manufacturing**	1. To be able to define various CAD/CAM devices. 2. To be able to describe engineering components using various modeling techniques. 3. To be able to demonstrate and develop CAM programs. 4. To analyze the basics of computer aided process planning. 5. To be able to judge various manufacturing techniques using computer.
	BTME-506 Computer Aided Design and Manufacturing Lab	1. Students will be able to do 2D modelling. 2. Students will be able to do 3D modelling. 3. Students will be able to do assembling and drafting with proper mating conditions and interference checking.
15.	**BTME-503 Mechanical Measurement and Metrology**	1. Students are able to define the basic principles of measurements and various types of standards of measurement used in industry. 2. Students will be able to illustrate static and dynamic characteristics of measurement systems.

		3. Students will be able to apply calibration to various measuring systems in order to overcome errors. 4. Students will be able to categorize the linear, angular measurement devices. 5. Students will be able to gain knowledge of various types of sensors and transducers and their role in instrumentation. 6. Students will able to recommend the various pressure, flow, temperature measurement devices required in manufacturing or process industry.
	BTME-507 Mechanical Measurement and Metrology Lab.	1. Students will be able to understand the concepts and fundamental of measurement. 2. Students will be able to understand the concept the usage of measuring instrument and calibration.
16.	**BTME-504 Industrial Automation and Robotics**	1. Students will able to explain the basic need, scope and social impact of Automation and Robotics in the engineering world. 2. Students will be able to describe the construction detail and working of various parts used in automation system. 3. Students will be able to design and construct the different automation system to bring innovation in the various organization of the world. 4. Students will efficiently apply the automation system in manufacturing industries at their respective demand in working process.
	BTME-508 Industrial Automation and Robotics Lab	1. Students will be able to define various types of hydraulic and pneumatic circuits. 2. Students will be able to describe the working of various types of hydraulic and pneumatic valves. 3. Students will be able to construct various types of circuits by using different types of direction control valves. 4. Students will be able to compare different types of robotic end effectors.
17.	**BTME-505 Automobile Engineering**	1. Students will be able to use their depth knowledge and skills of Automobile Engineering to pursue successful professional career in Automobile Industry. 2. Students will be able to explain the working of shock absorbers 3. Students will be able to identify and solve automobile engineering problems

		4. Students will be able to compare different types of wheels and tyres. 5. Students will be able to judge formation of automobile pollution and various control techniques.
	BTME-509 **Automobile Engineering Lab**	1. Students will have the ability to understand the troubleshooting in cooling system of an automotive vehicle. 2. Students will be able to replace the piston rings. 3. Students will be able to measure various steering geometry.
18.	**BTME-601** **Design of Machine Elements-II**	1. Students will be able to define and design various types of belt, rope, chain and gear drives. 2. Students will be able to describe the various principles and modes of lubrication. 3. Students will gain the knowledge to design various types of slider and roller bearings. 4. Students will be able to compute the energy stored in a flywheel and will able to design flywheel. 5. Students will be able to analyze and design various types of springs 6. Students will have the ability to design various types of clutches and brakes.
19.	**DE/ME-2.5** **Total Quality Management**	1. Students will be able to define quality, total quality management and Total Quality Management Models. 2. Students will be able to understand the objectives of total quality management, total quality, and total quality control. 3. Students will be able to analyze the applications of benchmarking, planning process to control the quality of product. 4. Students will be able to do analysis of standards required for quality management and quality control. 5. Students will be able to synthesis just in time system and total employee involvement. 6. Students will be able to evaluate that how to obtain the Excellence in manufacturing /services.

20.	**DE/PE 2.0** **Design Of Non Traditional Machining**	1. Students will be able to define the non-conventional machining processes. 2. Students will be able to explain the characteristics of non traditional machining. 3. Students will be able to apply various non traditional machining processes. 4. Students will be able to compare various non traditional machining processes. 5. Students will be able to develop mathematical model relating MRR with non traditional machining processes. 6. Students will be able to evaluate the best non traditional machining process from various non traditional process related to particular job.
21.	**BTME-602** **Heat Transfer**	1. To be able to understand concepts and fundamental laws of different mode heat transfer. 2. To identify and solve the conduction convention & radiation related problems. 3. To analyze and interpret data with the empirical correlations for free and forced convention & radiation related problems.
	BTME-605 **Heat Transfer Lab.**	1. 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. 2. Students will be able to identify and analyse the result of experiments and recognize the trends of output of the experiments. 3. Students will able to recognize the various types heat exchange devices and their applications in industry.
22.	**BTME-603** **Fluid Machinery**	1. Graduates will be able to define concept of fluid machinery. 2. Graduates will be able to describe working construction and operation of various turbines. 3. Graduates will be familiarizing with the uses of various fluid machineries. 4. Graduates will be able to distinguish various turbine and pumps and hydraulic machinery. 5. Graduates will be able to solve problems related to work done and gain efficiency. 6. Graduates will be able to design turbine by varying parameters.
	BTME-606	1. Students will be able to analyze the working of the hydraulic ram.

	Fluid Machinery Lab.	2. Students will be able to analyze the working of the Francis turbine. 3. Students will be able to analyze the working of the reciprocating pump. 4. Students will be able to working of the pelton turbine. 5. Students will be able to analyze the working of centrifugal fan/ blower. 6. Students will be able to understand the working of Hydroelectric Power Station.
23.	**BTME-604 Statistical and Numerical Methods in Engineering**	1. Students will be aware of the mathematical background for the different numerical methods introduced in the course. 2. 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. 3. Students will be able to use different numerical methods for interpolation, differentiation, integration, solving set of ordinary and partial differential equations. 4. Students will be able to analyze data with the help of probability distributions. 5. Students will be able to develop rational thinking, by which they can able to create programs in computer languages. 6. Students will be able to judge the difference between analytic methods and numerical methods.
24.	**BTME-801 Industrial Engineering and Management**	1. The students will be able to define the concept of management and principles of management. 2. The students will be able to explain the concept of organization and various types of organization. 3. Graduates may understand and solve the problems of management planning & decision making. 4. The students will be able to analyze the problem of plant layout and location. 5. The students will be able to designing organizational structure. 6. The students will be able to judge the productivity and value engineering.

25.	**BTME-802** **Refrigeration and Air Conditioning**	1. Students will able to understand the basic concept and fundamental of refrigeration and air conditioning system. 2. Students will able to identify & solve the cooling load of refrigeration and air conditioning system. 3. Students will able to analyse the rate and state of air supply to air conditioning space by using the psychometric charts.
	BTME-804 **Refrigeration & Air Conditioning lab**	1. Students will be able to explain various elements of a vapour compression refrigeration system. 2. Students will be able to explain the working of domestic refrigerator and electrolux refrigerator. 3. Students will be able to calculate cooling load for a large building. 4. Students will be able to explain the working of window type room air conditioner. 5. Students will be able to explain the working of water cooler.
26.	**BTME-803** **Mechanical Vibrations**	1. Students will be able to define the basics of vibration. 2. To be able to understand the various types of vibration. 3. To be able to solve the problems related to single, double and multi degree of freedom systems. 4. Students will be able to compare the various types of vibration absorbers. 5. Students will be able to explain the multi degree of freedom and continuous systems.
	BTME-805 **Mechanical Vibrations lab**	1. Students will be able to verify the relation of simple pendulum. 2. Students will be able determine the radius of gyration 'k' of a given compound pendulum and given bar by using bi-flier suspension. 3. Students will be able to solve natural frequency of torsional vibration of single rotor system. 4. Students will be able to compare natural frequencies single rotor system and two rotor systems. 5. Student will be able to explain the working of vibration absorber.
27.	**IT 500** **Industrial Training**	1. Ability to acquire and apply fundamental principles of science and engineering. 2. Capability to communicate effectively.

		3. Ability to identify, formulate and model problems and find engineering solution based on a systems approach. 4. Ability to conduct research in the chosen fields of engineering. 5. Understanding of the importance of sustainability and cost-effectiveness in design and developments of engineering solution. 6. Ability to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurship skills. 7. Awareness of the social, cultural, global and environmental responsibility as an engineer. 8. Capability and enthusiasm for self-improvement through continuous professional development and life-long learning.
28.	**HU - 251** **Human Resource Management**	1. Students will be able to define the functions of human resource management within organizations. 2. Students will be able to understand the current issues, trends, practices, and processes in HRM. 3. Students will be able to analyze the role human resources manager in an organization. 4. Students will be able to do Job analysis & design. 5. Students will be able to synthesis of Problem related to human resource challenges and Methods of Recruitment. 6. Students will be able to evaluate personnel management and human resources management.
29.	**BTME – 310** **Workshop Training**	1. Students are able to name the different marking tools, measuring instruments and various types of cutting tools used in manufacturing process. 2. Students will be able to describe the job procedure involved in making a job in various shops. 3. Students will be able to use the different marking tools, measuring instruments and various types of cutting tools used in manufacturing process. 4. Students will be able to compare the various tools used in cutting/marking/measuring tools. 5. Students will be able to create the various jobs in various shops. 6. Students will able to recommend the shop for the preparation of job.

30.	**BTME- IT** **Industrial Oriented And Project Training**	1. To apply the fundamental principles of science and engineering to industrial uses/ applications. 2. Use the effectively communication among the industrial persons/workers to make the healthy and positive relations. 3. To examine and indentify all process/practices/problems in industrial applications and find engineering solution based on a system approach. 4. In order to improve the research and development activity based on the engineering applications. 5. To modify the design and development of product is based on engineering applications. 6. To evaluate the performance/efficiency of product/apparatus and apply the engineering knowledge, management, leadership and technical skills.
	BTME-IT **Software Training**	1. To apply the fundamental principles of Computer graphic lab during the software training. 2. Use the tool (Auto CAD/CAM) effectively in the industrial operation, drafting a new product and modify accordingly as per their requirements. 3. In order to improve the research and development activity based on the CAD/CAM applications. 4. To modify the design and develop a product as per current market conditions. 5. To evaluate the performance of product by computational fluid dynamics, stress, fatigue analysis during the software training.

31.	**BTME – 607** **Minor Project**	1. Students will be able to design various types of components involving the aspects like manufacturing, casting/forging etc. 2. Students will be able to describe the various fabrication processes and techniques. 3. Students will gain the knowledge to design core mechanical equipments/members/components/machine parts. 4. Students will be able to compute the various aspects needed in the design of mechanical parts/components which involves manufacturing, fabrication etc. 5. Students will be able to analyze and design various types of aspects used in the design process of their major project. 6. Students will have the ability to explain any positive gain in the project made.
32.	**BTME – 806** **Major Project**	1. Students will be able to design various types of components involving the aspects like manufacturing, casting/forging etc. 2. Students will be able to describe the various fabrication processes and techniques. 3. Students will gain the knowledge to design core mechanical equipments/members/components/machine parts. 4. Students will be able to compute the various aspects needed in the design of mechanical parts/components which involves manufacturing, fabrication etc. 5. Students will be able to analyze and design various types of aspects used in the design process of their major project. 6. Students will have the ability to explain any positive gain in the project made.

Course Outcomes of ME Department (2018 Onwards)

Course Outcomes of B. Tech 2nd Year (2018 Onwards)

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	**BTME301-18 FLUID MECHANICS**	1. Understand the concept of fluids and their properties. 2. Apply the concept to solve the problems related to statics, dynamics and kinematics of fluids. 3. Use and apply dimensional analysis and similitude techniques to various physical fluid phenomena. 4. Distinguish various types of flows and learn flow measurement methods**.**
2.	**BTME302-18 THEORY OF MACHINES -I**	1. Understand constructional and working features of important machine elements. 2. Design belt, rope and chain drives for transmission of motion from one shaft to another 3. Identify different Cam and follower pairs for different applications and construct cam profile for required follower motion. 4. Understand the function of brakes, dynamometers, flywheel and governors
3.	**BTME303-18 MACHINE DRAWING**	1. Read, draw and interpret the machine drawings and related parameters. 2. Use standards used in machine drawings of machine components and assemblies. 3. Learn the concept of limits, fits and tolerances in various mating parts. 4. Visualize and generate different views of a component in the assembly. 5. Use CAD tools for making drawings of machine components and assemblies.
4.	**BTME304-18 STRENGTH OF MATERIALS-I**	1. Understand the concepts of stress and strain at a point, in the members subjected to axial, bending, torsional loads and temperature changes. 2. Determine principal stresses, maximum shearing stress and their angles, and the stresses acting on any arbitrary plane within a structural element. 3. Find bending moment and shear force over the span of various beams subjected to different kinds of loads

		4. Calculate load carrying capacity of columns and struts and their buckling strength. 5. Evaluate the slope and deflection of beams subjected to loads
5.	**BTEC305-18 BASIC ELECTRONICS ENGINEERING**	1. Understand construction of diodes and their rectifier applications. 2. Appreciate the construction and working bipolar junction transistors and MOSFETs. 3. Design Op-Amp IC based fundamental applications. 4. Comprehend working of basic elements of digital electronics and circuits.
6.	**BTME305-18 BASIC THERMODYNAMICS**	1. Apply energy balance to Systems and Control Volumes in situations involving heat and work interactions. 2. Evaluate changes in thermodynamic properties of substances. 3. Evaluate performance of energy conversion devices. 4. Explain and apply various gas power and vapor power cycles.
7.	**BTME306-18 Strength of Material Lab**	1. Measure the various mechanical properties such as tensile and compressive strength, impact strength, torsion strength and fatigue strength and hardness of brittle and ductile materials. 2. Calculate load carrying capacity of long columns and their buckling strength.
8.	**BTME307-18 Theory of Machine (Lab)**	1. Determine gyroscopic couple, balancing of rotating masses and Cam profile analysis. 2. Determine gear- train value of compound gear trains and epicyclic gear trains.
9.	**BTME308-18 Fluid Mechanics (Lab)**	1. Distinguish various type of flows and flow measurement methods and concept of statics and dynamics of liquids. 2. Determine discharge and head loss, hydraulic and friction coefficient, for different types of flow in pipe and open channels.
10.	**BTME401-18 APPLIED THERMODYNAMICS**	1. Learn the functioning and performance evaluation of reciprocating air compressors. 2. Analyze the combustion phenomenon in boilers and I.C. engines. 3. Use of Steam Tables and MollierChart to solve vapour power cycle problems.

		4. Explain the constructional features and working of steam power plants and to evaluate their performance.
11.	**BTME402-18 FLUID MACHINES**	1. Recognize basic components of turbo machines and understand related fundamental laws/ principles and apply these for calculation of various parameters like work done, force efficiency etc. 2. Know about constructional details, working and design aspects of runner/wheel and evaluate the performance of various turbines like Pelton, Kaplan and Francis. 3. Know about constructional details, working and evaluate the performance of centrifugal pump under different vane shape conditions. 4. Know about constructional details, working and evaluate the performance of reciprocating pump and evaluate the effect of various deviations from the ideal conditions on the work done. 5. Know about constructional details and working of hydraulic devices like fluid coupling, accumulator and intensifier.
12.	**BTME403-18 STRENGTH OF MATERIALS II**	1. Apply the basics to find stresses in various applications (shells, curved beams and rotating discs). 2. Analyse the change in dimensions of shells, curved beams and rotating discs under operation. 3. Determine stresses, deflection and energy stored in various kinds of springs subjected to load and twist. 4. Understand the concept of failure theories and strain energy. 5. Evaluate shearing stress variation in beams of different cross-section and materials.
13.	**BTME404-18 MATERIALS ENGINEERING**	1. Understand the significance of structure-property-correlation for engineering materials including ferrous and nonferrous. 2. Explain the use and importance of various heat treatment processes used for engineering materials and their practical applications. 3. Understand the various structural changes occurred in metals with respect to time temperature transformations. 4. Understand the significance of Fe-C and TTT diagram for controlling the desired structure and properties of the materials.

14.	**BTME405-18 THEORY OF MACHINES-II**	1. Understand the basic concepts of inertia forces & couples applied to reciprocating parts of a machine. 2. Understand balancing of rotating and reciprocating parts of machines. 3. Select suitable type of gears for different application and analyse the motion of different elements of gear trains. 4. Understand the concept and application of gyroscopic effect. 5. Gain knowledge of kinematic synthesis.
15.	**BTME406-18 Applied Thermodynamics (Lab)**	1. Understand the construction and working of IC engines, and evaluate their performance. 2. Identify the various types of boilers & condensers.
16.	**BTME407-18 Fluid Machines (Lab)**	1. Conduct experiments on scaled down models or on actual size hydraulic machines and evaluate results in terms of unit or specific quantities for comparison purpose. 2. Understand the working of various hydraulic machines (turbines and pumps) and can suggest remedial solutions for various faults.
17.	**BTME408-18 Material Engineering (Lab)**	1. Analyse the microstructure of different ferrous and non-ferrous samples. 2. Explore the effect of heat treatment on various engineering materials by analysing its microstructure and hardness.

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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, manufacture ability, and sustainability
- An ability to function on multidisciplinary teams
- 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

- **Working with Instruments**: Appreciate working of electronic equipment/systems guided by practical experience and theoretical fundamental knowledge of Electronics & Communication Engineering.
- **Extrapolating Domain Knowledge**: Ability to provide solutions to real-world problems in the field of Electronics & Communication Engineering by extrapolating the fundamental knowledge of electronic devices, circuits, embedded & communication systems.
- **Innovation and Design Ability**: Innovative thinking and ability to design and/or improve products and/or systems for the society and industry for better utilization, human safety and reduced cost.

Course Outcomes of ECE Department (2011 Onwards)

Serial No.	Course Code and Name	Course outcomes
1.	**BTAM-301 Engineering Mathematics-3**	**COUT 1** Students should be able to define Fourier Series of various functions and describe various Wave Forms. **COUT 2** Students can apply Laplace Transform to solve Simultaneous Differential equations. **COUT 3** Students should apply functions of complex variables which help in solving many complex problems in heat conduction, fluid dynamics and electrostatics. **COUT 4** Students should be able to analyze Partial Differential Equations and their solutions which occur in engineering problems. **COUT 5** Students should be able to find power series solutions of Differential equation.

2.	**BTCS-305 Object Oriented Programming using c++**	**COUT 1** Students should be able to define the essential features and elements of the C++ programming language **COUT 2** Students should be able to describe the concepts of class, object, function, constructor, instance, data abstraction, function abstraction, inheritance, overriding, overloading, and polymorphism. **COUT 3** Students should be able to solve various real world computing problems based on the concept of object oriented programming. **COUT 4** Students should be able to design programs using memory allocation and deallocation procedures. **COUT 5** Students should be able to design Templates and use them in various programming languages. **COUT 6** Students should be able to design programs that can handle exceptions.
	BTCS-309 Object Oriented Programming using C++ Lab	**COUT 1** Students should be able to construct programs using classes and objects. **COUT 2** Students should be able to create programs using constructors, destructors and initializer list. **COUT 3** Students should be able to develop operator overloading and type casting programs. **COUT 4** Students should be able to demonstrate inheritance, polymorphism. **COUT 5** Students should be able to design Templates and manipulation of files. **COUT 6** Students should be able to formulate file handling.

3.	**BTEC-301 Analog devices and Circuits**	**COUT 1** Knowledge and Analysis about Semiconductor diodes, Materials and their Characteristics. **COUT 2** Knowledge about the Transistor biasing and its configuration and types. **COUT 3** Detailed Knowledge and Awareness of various Amplifiers and its types. **COUT 4** Broad Understanding and implementation of Negative and positive feedbacks in various components for the better understanding of industrial requirements. **COUT 5** Understanding about the transistor configurations using hybrid models and contemporary issues and there remedies, implementations.
	BTEC-304 Analog Devices and Circuits Lab	**COUT 1** Students will be able to understand the working of Rectifier, Amplifier, & Oscillator etc. **COUT 2** Students will be able to interpret the performance of class A, class B , class C & class B push pull amplifier. **COUT 3** Students will be able to analyze the various characteristics of Oscillator, Rectifier & Amplifier etc. **COUT 4** Students will be able to apply the class A, class B , class C & class B push pull amplifier in real time application.
4.	**BTEC -302 Digital circuit and Logic Design**	**COUT 1** Students will be able to represent numerical values in various number systems and perform number conversions between different number systems. **COUT 2** Students will be able to analyze and design digital combinational circuits like decoders, encoders, multiplexers, and de-multiplexers including arithmetic circuits (half adder, full adder, multiplier). **COUT 3** Students will be able to analyze sequential digital circuits like flip-flops, registers, counters. **COUT 4** Students will be able to apply the Knowledge of the nomenclature and technology in the area of memory devices: ROM, RAM, PROM, PLD, FPGAs, etc. **COUT 5** Students will be able to evaluate the importance and need for verification, testing of digital logic and design.

	BTEC-305 Digital Circuits & Logic Design Lab	**COUT 1** Students will be able to understand the various logic gates. **COUT 2** Students will be able to interpret the design of digital circuits with basic component to meet a set of specification. **COUT 3** Students will be able to analyze the digital circuits. **COUT 4** Students will be able to apply the application of logic gates for designing the various digital circuits. **COUT 5** Students will be able to evaluate the performance of digital circuits.
5.	**BTEC-303 Network Analysis and Synthesis**	**COUT 1** Knowledge of electrical ckt concept Node analysis , Mesh analysis. **COUT 2** Graduates are enabled to interpret Time & frequency Domain. **COUT 3** Students are enabled to Synthesis network. **COUT 4** Students are enabled to implement Laplace tranformation. **COUT 5** Students are enabled to Evaulate filter performance. .
6.	**BTEE-402 Linear Control System**	**COUT 1** Students will be able to Understand mathematical models of linear discrete-time control systems using transfer s functions and state-space models to solve engineering problems. **COUT 2** Students will be able to Analyze transient and steady-state behaviors of linear discrete-time control systems. **COUT 3** Students will evaluate whether performance of linear discrete-time control systems meet specified design criteria. **COUT 4** Student will apply the designing of controllers in real time applications. **COUT 5** Students will able to understand working of control system components.

7.	**BTEC-401 Analog Communication System**	**COUT 1** Students will be able to understand the basic concepts of analog communication systems. **COUT 2** Student will interpret the different analog modulation techniques. **COUT 3** Student will be able to analyze the transmission and reception using AM,FM and PM techniques for SSB transmission and reception. **COUT 4** Students will able to design analog communication systems. **COUT 5** Students will evaluate the performance of different analog and digital communication systems.
	BTEC-406 Analog Communication System Lab	**COUT 1** Students will be able to Understand analog communication system. **COUT 2** Students will be able to interpret the different modulator & demodulator. **COUT 3** Students will be able to analyze the various modulation & demodulation techniques. **COUT 4** Students will apply the modulation & demodulation techniques on different communication system. **COUT 5** Students can evaluate the performance of AM, FM and PM.
8.	**BTEC-402 Signal and System**	**COUT 1** Students will be able to identify the basic difference between continuous and discrete time signals & systems. **COUT 2** Students will be able to describe the significance of Fourier analysis. **COUT 3** Students will be able to explain the way to obtain frequency response of systems described by linear constant coefficie nt differential/difference equations. **COUT 4** Students will be able to apply Fourier transform, Laplace transform and Z transform in the analysis of continuous time and discrete time systems. **COUT 5** Students will be able to evaluate LTI system stability.
	BTEC-408 Signal and System using MATLAB Lab	**COUT 1** Students will be able to understand the elementary signals. **COUT 2** Students will be able to interpret the different type of signal. **COUT 3** Students will be analyze the response of LTI systems.

		COUT 4 Students will be able to apply the concept of convolution and correlation. **COUT 5** Students will be able to evaluate the performance of LTI system.
9.	**BTEC-403 Electromagnetic and Antenna**	**COUT 1** Students will be able to understand the electromagnetism and antenna theory. **COUT 2** Students will be capable to interpret waveguides, transmission lines and antennas. **COUT 3** Students will be capable applying the theory of electromagnetism to various types of space communication. **COUT 4** Students will be capable of analysing the radiation pattern and free space communication signal strength. **COUT 5** Students will be capable of innovating ideas of designing the antennas. **COUT 6** Students will be capable to check the performance of antenna and wave propagation.
10.	**BTEC-404 Electronic Measurement & Instrumentation**	**COUT 1** Students will understand the general instrumentation system. **COUT 2** Students can interpret measurements and errors using different electronic meters. **COUT 3** Student can analyze working principle of various transducers used to measure Temperature, Displacement etc. **COUT 4** Students can learn measurement system in telemetry, storage devices and in data acquisition system. **COUT 5** Student can evaluate the calibration process , waveforms on various generators, spectrum analyzers etc.
	BTEC-407 Electronic Measurement and Instrumentation Lab	**COUT 1** Students will be able to identify the electronic instruments & their use. **COUT 2** Students will be able to interpret the errors. **COUT 3** Student will be able to analyze various type of measurements. **COUT 4** Students will be able to apply the measurement techniques in instrumentation field.

11.	**BTEC-405 Pulse Wave Shaping and Switching**	**COUT 1** Students will be able to understand pulse shapes and behaviour. **COUT 2** Students will be able to predict the characteristics as well as design and test amplifiers, level converters, Schmitt triggers, pulse and wave-shaping circuits. **COUT 3** Students will be able to design and analyse clipping and clamping circuits. **COUT 4** Students will be able to calculate and analyze performance of operational amplifiers and comparators.
12.	**Industrial Training (6 Weeks)**	**COUT 1** Students will have the knowledge and broad understanding about the industry exposure and its needs. **COUT 2** Students can integer their practical knowledge from the industry with the theory of their subjects which leads to broad understanding about their field. **COUT 3** Students can apply the knowledge to formulate the problems related to industry. **COUT 4** Students can develop and design new projects by implementing the knowledge which they have gained from the industry.
13.	**BTCS-304 Data Structure**	**COUT 1** Students should be able to describe the usage of various data structures. **COUT 2** Students should be able to design simple algorithms for solving computing problems. **COUT 3** Students should be able to choose appropriate data structure as applied to specified problem definition. **COUT 4** Students should be able to apply operations like searching, insertion, deletion, traversing mechanism etc. on various data structures. **COUT 5** Students should be able to identify the associated algorithms' operations and complexity. **COUT 6** Students should be able to develop computer programs to implement different data structures and related algorithms. **COUT 7** Students should be able to discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.

14.	**BTEC-501 Digital Communication System**	**COUT 1** Students will understand the working and concepts of digital communication system. **COUT 2** Students will enable the student to interpret practical issues relating to Digital communication. **COUT 3** Students can do analyses and evaluate different digital carrier modulation and demodulation techniques. **COUT 4** Students can apply concepts of modulation and demodulation in cellular and other communications. **COUT 5** Students can evaluate the influence of noise on communications signals.
	BTEC-507 Digital Communication System Lab	**COUT 1** Students have the understanding of digital communication system. **COUT 2** Students can demonstrate the various digital modulation, encoding techniques. **COUT 3** Students can analyse the digital modulation techniques by error detection techniques. **COUT 4** Students can apply the principal of digital modulation and coding to various communication system. **COUT 5** Students can evaluate the performance of various digital modulation and encoding techniques.
15.	**BTEC-502 Digital Signal Processing**	**COUT 1** To Understand the basic of digital signal processing and manipulation of Discrete time systems. **COUT 2** To implement the LTI systems using DFT and FFT, as well as some of its applications. **COUT 3** To analyse how to use Z transform in DSP. **COUT 4** Designing and realization of FIR and IIR filters. **COUT 5** Designing of different type of signals and filters using MATLAB.
	BTEC-505 Digital Signal Processing Lab	**COUT 1** Students will be able to understand the different types of signal and systems. **COUT 2** Students will able to interpret the FIR and IIR filters **COUT 3** Students will be able to analyze the cascade realization of IIR and FIR filters. **COUT 4** Students will be able to apply the Z transform in LTI systems**.** **COUT 5** Students will be able to evaluate the performance of frequency response of different analog filters.

16.	**BTEC-503 Linear Integrated Circuit**	**COUT 1** Introduce the basic knowledge of integrated circuits like op-amp, timers etc. **COUT 2** Interpret about linear and non-linear circuits and their graphs. **COUT 3** Analysis Design circuits and calculate and measure output voltages for the following: inverting, non-inverting, voltage follower, summing, and averaging op-amp operating level translate real world problems into digital formulations. **COUT 4** To study applications and evaluate about the working principles and designing of ADC and DAC converters.
	BTEC-506 Linear Integrated Circuit Lab	**COUT 1** Students will be able to understand the design principles of integrated circuits. **COUT 2** Students will be able to interpret the circuit operation of the 555 timer IC and regulator IC. **COUT 3** Students will be able to analyze the various analog filter circuits. **COUT 4** Students will be able to apply the Opamp in various circuits. **COUT 5** Students will evaluate the performance of electrical /electronic devices such as amplifier, Oscillator, Filters, Generators.
17.	**BTEC-504 Microprocessor and Microcontroller**	**COUT 1** Students will be understand architecture of 8085 microprocessor and 8051 microcontroller. **COUT 2** Students will be able to interpret addressing modes and instructions used. **COUT 3** Students will be able to do analysis of stack, time delay, interrupts counters, subroutines in these chips. **COUT 4** Students will be able to apply concepts on interfacing devices like Stepper motor, LED with 8085 and 8051 chips using assembly language. **COUT 5** Students will be able to evaluate performance of microprocessor and microcontroller.
	BTEC-508 Hardware Program and interfacing	**COUT 1** Students will be able to understand the architecture of 8085 microprocessor and 8051 microcontroller. **COUT 2** Students will be able to interpret the coding techniques of microprocessor and microcontroller. **COUT 3** Students will be able to do analyses of different instruction set & interrupts of microprocessor and microcontroller. **COUT 4** Students will be able to apply microprocessor and microcontroller in embedded system..

		COUT 5 Students will be able to evaluate performance of microprocessor and microcontroller.
18.	**BTCS-401 Operating System**	**COUT 1** Students will be able to define the basic concepts of operating system, its roles and functions, views and architecture. **COUT 2** Students will be able to describe the management activities of operating system such as process, memory, file and device management. **COUT 3** Students will be able to solve various scheduling algorithms, deadlock related issues and apply algorithms to avoid deadlocks and will be able to construct page replacement algorithms. **COUT 4** Students will be able to analyze memory and device management strategies, compare and contrast paging and segmentation, analyze the need of virtual memory, protection and security. **COUT 5** Students will be able to design and develop various techniques to solve problems related to process and memory management. **COUT 6** Students will be able to evaluate various case studies of LINUX/ UNIX and windows based operating systems.
19.	**BTEC-601 Microwave and Radar Engineering**	**COUT 1** To have basic knowledge of microwave tubes. **COUT 2** To Identify and know the significance of different types of microwave devices. **COUT 3** To apply the microwave sources for practical and industrial applications. **COUT 4** To analyze microwave passive devices with scattering parameters. **COUT 5** To evaluate the performance of microwave and radar in communication and industry.
	BTEC-606 Microwave Engineering Lab	**COUT 1** Students will be able to understand the microwave analysis methods. **COUT 2** Students will be able to interpret how transmission & wavelength structure are used as elements in communication. **COUT 3** Students will be able to analyse method to determine circuits properties of active/passive microwave devices. **COUT 4** Students will be able to apply the knowledge of isolator, directional couplers, and circulator in area of microwave communication.

		COUT 5 Students will be able to evaluate the performance of horn antenna using microwave signal.
20.	**BTEC-602 Wireless Communication System**	**COUT 1** Students will be able understand the basic wireless communication systems. **COUT 2** Students will be able to describe cellular Network system design **COUT 3** Students will be able to analyse the performance of different wireless networks. **COUT 4** Students will be able to apply the design criteria of cellular network to real time networks. **COUT 5** Students will be able to evaluate the various technical parameter performance of wireless communication system.
21.	**BTEC-603 Engineering Economics & Industrial Management**	**COUT 1** Students will be able to understand how the managerial tasks of planning, organizing, and controlling can be executed in a variety of circumstances. **COUT 2** Students will be able to interpret various economics and management practices. **COUT 3** Students will be able to do analyses of economic situations including opportunities and threats that will impact management of an organization. **COUT 4** Students will be able to apply managerial practices and choices relative to ethical principles and standards. **COUT 5** Students will evaluate the most effective action to take in specific situations.
22.	**BTEC-604 VLSI Design**	**COUT 1** Students will be able to understand the concepts of CADD tools and introduction to VHDL. **COUT 2** Students will be able to interpret VHDL statements, operators and MOS devices. **COUT 3** Students will be able to analyze CMOS and NMOS devices. **COUT 4** Students can apply VHDL concepts to digital and analog circuits. **COUT 5** Students can design combinational and sequential circuits using VHDL. **COUT 6** Students will be able to evaluate the characteristics and performance estimation of R, L, C and other switching circuits.

	BTEC-605 VLSI Lab	**COUT 1** Students will be able to understand the digital circuits and verify its function using verilog HDL. **COUT 2** Students will be able to interpret the sequential and combinational circuits. **COUT 3** Students can analyze the various system using VLSI techniques. **COUT 4** Student will be able to apply the VHDL concept for designing the multiplexer ,decoder, encoder and flip-flop etc.
23.	**BTEC-907 Information Theory and Coding**	**COUT 1** Students will understand the different coding technique. **COUT 2** Students will demonstrate the discrete memoryless sources. **COUT 3** Students will learn to analyze the information capacity of discrete memoryless channels. **COUT 4** Students can apply the mathematical theory of linear channel codes for error detection and correction. **COUT 5** Students can select and design simple linear blocks error correcting codes, cyclic block cods using feedback shift register logic circuits and convolution codes and can use in various applications.
24.	**BTCS-403 Computer Network**	**COUT 1** Knowledge of contemporary issues in computer networks. **COUT 2** Specify and identify deficiencies in existing protocols, and then go on to formulate new and better protocols. **COUT 3** Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies; **COUT 4** Ability to design, implement, and analyze simple computer networks. **COUT 5** Evaluate the performance of computer network.
25.	**BTEC-701 Embedded System**	**COUT 1** Students will be able to understand what is embedded system and the embedded system design process. **COUT 2** Students will be able to interpret the different Component of Embedded systems /ARM programming. **COUT 3** Students can analyze embedded system using C programming. **COUT 4** Student can design the embedded system. **COUT 5** Students will be able to evaluate the designing of Embedded system.

	BTEC-704 Embedded System Lab	**COUT 1** Students will be able to understand the ARM architecture. **COUT 2** Students will be able to interpret the different Component of Embedded systems /ARM programming. **COUT 3** Students can analyze ARM system using C programming. **COUT 4** Student will be able to apply the concept of embedded system for interfacing the stepper motor, DC motor and LCD.
26.	**BTEC-702 Optical Communication**	**COUT 1** Students will be able to understand the basic principles of optical communication system. **COUT 2** Students will be able to analyse the performance of both digital and analogue optical fibre systems **COUT 3** Students will be able to calculate the system bandwidth, noise, probability of error and maximum usable bit rate of a digital fibre system. **COUT 4** Students will be able to apply the concept of optical transmission in various communication oriented projects. **COUT 5** Students will be able to evaluate the performance of various factors like system link loss, distortion and dynamic range of an RF photonic link.
	BTEC-703Wireless and Optical System & Networks Lab	**COUT 1** Students will be able to understand the basic concept of wireless and optical communication system. **COUT 2** Students will be able to interpret the noise , attenuation , B.W & dispersion. **COUT 3** Students will be able to analyze the optical fiber communication system. **COUT 4** Students will be able to apply the concept of optical fiber communication system on real time communication system. **COUT 5** Students will be able to evaluate the performance of wireless and optical communication system.

27.	**BTEC-913 Human Resource Management**	**COUT 1** To introduce**,** manage and plan key human resource functions within organizations. **COUT 2** To interpret, examine current issues, trends, practices, and processes in HRM. **COUT 3** To analyze problem-solve human resource challenges. **COUT 4** To apply effective written and oral communication skills.
28.	**BTEC-916 Neural Network & Fuzzy Logic**	**COUT 1** Students will Understand the basics of Neural network and fuzzy logic systems. **COUT 2** Students will interpret different models of Neural network. **COUT 3** Students will analyze the different neural networks. **COUT 4** Students will be able to apply knowledge to particular applications to improve performance. **COUT 5** Students will evaluate the performance of Fuzzy systems.
29.	**BTEC-705 Major Project**	**COUT 1** Students will have the Knowledge and broad understanding of basic hardware components of the electronic and communication system. **COUT 2** Students can integrate the theory of their all Subjects for making the projects. **COUT 3** Students can apply the knowledge to formulate the problems related with electronic and communication fields and concepts on the project. **COUT 4** Students can develop and design new projects by implementing the knowledge from the advance and recent technology.

30.	**Software Training**	**COUT 1** Students will be able to define compelling and viable problems . **COUT 2** Students will be able to develop skills to create practical solutions to identified problem. **COUT 3** Students will be able to interpret the software lifecycle model and other artifacts appropriate for problem. **COUT 4** Students will be able to identify and master tools required for the project. **COUT 5** Students will be able to plan and work systematically towards completion of a project works. **COUT 6** Students will be able to develop the ability to explain and defend their work in front of an evaluation panel.
	Industry oriented Project Training	**COUT 1** Students will be able to understand latest technology of industry. **COUT 2** Students will be able to demonstrate practical ideas. **COUT 3** Students can analyze the industry based Live project. **COUT 4** Students will be able to develop and design new projects by using latest Technologies. **COUT 5** Students will be able to evaluate the requirements of industry related projects.

Course Outcomes of ECE Department (2018 Onwards)

Serial No.	Course Code and Name	Course outcomes
1	**BTAM-303-18 Mathematics-3**	**COUT 1** Students will learn the mathematical tools needed in evaluating multiple integrals and their usage **COUT 2** Students will learn the effective mathematical tools for the solutions of differential equations that model physical processes. **COUT 3** Studentswill learn the tools of differentiation and integration of functions of a complex variable that are used in various techniques dealing engineering problems. **COUT 4** Students will be able to introduce the solution methodologies for second order Partial Differential Equations with applications in engineering. **COUT 5** Students should be able to provide an overview of probability and statistics to engineers.
2	**BTEC-301-18 Electronic Devices**	Students will demonstrate the ability to: 1. Understand physics of semiconductors and behavior of charge carriers within semiconductors 2. Understand the working of semiconductor diodes supported with mathematical explanation. 3. Understand the working of BJT and MOSFET with their equivalent small signal models. 4. Understand the chemical processes used in fabrication of integrated circuits.contemporary issues and there remedies, implementations.

	3BTEC-311-18 **Electronics Devices Lab**	Student will demonstrate the ability to: 1. Realize use of diodes in circuits with proper understanding to their working. 2. Understand characteristics & working of BJT in different configurations. 3. Understand characteristics & working of MOSFET in circuits. 4. Think and design working circuits based on diodes, BJTs and MOSFETs.
4	**BTEC-302-18 Digital System Design**	Student will demonstrate the ability to: 1. Apply concepts of Boolean algebra for handling logical expressions. 2. Understand working and realization of combinational circuits. 3. Understand working flip-flops and use them in designing of sequential circuits. 4. Understand fundamental concepts of logic families and architectural of programmable devices. 5. Use HDL programming tool for simulation of combinational & sequential circuits.
	5 BTEC-303-18 Electromagnetic Waves	Student will demonstrate the ability to: 1. Understand characteristics & wave propagation through transmission lines 2. Understand Maxwell's equations for electromagnetic waves 3. Characterize uniform plane wave 4. Calculate reflection and transmission of waves at media interface
	6 BTEC-312-18 Digital System Design Lab	Student will demonstrate the ability to: 1. Realize combinational circuits using logic gates. 2. Realize sequential circuits using logic gates. 3. Write & simulate VHDL programs for combinational & sequential circuits. 4. Think and design working projects using digital 74XX ICs.
7	**BTEC-304-18 Network Theory**	Student will be able to: 1. Analyze linear networks using network theorems. 2. Use Laplace transform to analyze transient & steady state response of linear networks. 3. Comprehend network parameters to analyze two port networks. 4. Realize one port networks using Foster's and Cauer's methods..

8	**BTEC-401-18 Analog Circuits**	Student will be able to: 1. Understand the biasing of transistors and analyze BJT/FET amplifiers 2. Analyze various rectifier and amplifier circuits 3. Analyze sinusoidal and non-sinusoidal oscillators 4. Understand various types of Power Amplifiers
9	**BTEC-402-18Microprocessors and Microcontrollers**	Student will demonstrate the ability to: 1. Understand architecture &functionalities of different building block of 8085 microprocessor. 2. Understand working of different building blocks of 8051 microcontroller. 3. Comprehend and apply programming aspects of 8051 microcontroller. 4. Interface & interact with different peripherals and devices.
	9 BTCS-301-18 Data Structures and Algorithm	Student will be able to: 1. Understand operations like searching, insertion, deletion, traversing on linear Data Structures and to determine their computational complexities 2. Understand operations like searching, insertion, deletion, traversing on various non linear Data Structures and to determine their computational complexities 3. Write algorithms for Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity. 4. Apply appropriate Data Structure as per specific problem definition.
11	**10 BTEC-403-18 Signals & Systems**	Students will demonstrate the ability to: 1. Mathematically characterize different types of signals and systems. 2. Analyze the behavior of linear-shift invariant systems. 3. Apply concepts of Fourier and Laplace Transforms to analyze continuous-time signals and systems. 4. Investigate discrete-time signals and systems using Discrete-Time Fourier and Z-Transforms and simple Probability concepts..

	EVS 101-18 Environment Sciences	1. Students will enable to understand environmental problems at local and national level through literature and general awareness. 2. The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who have done practical work on various environmental Issues. 3. The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate these problems. 4. Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world
12	**BTEC-411-18 Analog Circuits Lab**	Student will demonstrate the ability to: 1. study and verify the characteristics of diodes/BJTs in circuits with proper understanding to their working. 2. Understand frequency response & working of various types of Oscillators. 3. Understand characteristics & working of Power amplifiers. 4. Think and design working circuits based on diodes, BJTs and MOSFETs. communication signal strength.
13	**BTEC-412-18 Microprocessors and Microcontrollers Lab**	Student will be able to: 1. Write programs for common arithmetic operations with 8-bit/16-bit numbers using 8085. 2. Write programs for transfer, sort block of data with 8085/8086 processor(s). 3. Write programs for controlling stepper and DC motors using Microprocessor(s). 4. Write programs to generate waveforms and interface ADC and DAC using of 8051 Microcontroller.
14	**BTEC-501-18 Analog and Digital Communication**	Students will demonstrate the ability to: 1. Analyze and compare different analog modulation schemes for their efficiency and bandwidth 2. Analyze the behavior of a communication system in presence of noise 3. Investigate pulsed modulation system and analyze their system performance

		4. Analyze different digital modulation schemes and can compute the bit error performance
	15 BTEC-502-18 Digital Signal Processing	Students will demonstrate the ability to 1. Represent signals mathematically in continuous and discrete time and frequency domain 2. Get the response of an LSI system to different signals 3. Design of different types of digital filters for various applications
16	**BTEC-503-18 Linear Integrated Circuits**	Students will demonstrate the ability to: 1. Understand Differential and Cascade Amplifiers 2. Know the basics, working and characteristics of Op-Amps 3. Investigate various applications of Op-amps 4. Understand some specialized Op-Amps 5. Interpretation of Data Sheets and their Applications thereof.
	17 BTEC-504-18 Control Systems	Students will demonstrate the ability to 1. Characterize a system and find its study state behaviour 2. Investigate stability of a system using different tests 3. Design various controllers 4. Solve linear, non-linear and optimal control problems
18	**BTEC-905C-18 VLSI/ULSI Technology**	Students will demonstrate the ability to 1. understand the process of VLSI fabrication 2. Investigate the Oxidation processes for VLSI/ULSI device fabrication 3. Learn about the environment for VLSI/ULSI technology 4. Understand Lithography and deposition processes.
	19 BTEC-505-18 Project Management	Student will demonstrate the ability to: 1. study the basic concepts of Project Management. 2. learn about Project selection and organisation. 3. understand Project planning and scheduling. 4. learn about Project Monitoring, control and performance.
20	**BTEC-511-18 Analog and Digital Communication Laboratory**	Student will demonstrate the ability to: 1. study and verify the characteristics and output waveforms of AM, FM, PCM 2. study and compare noise in AM and FM systems

		3. investigate the output responses of PAM, PCM, PSK, FSK, MSK.
	21 BTEC-512-18 Digital Signal Processing Laboratory	Student will demonstrate the ability to: 1. Write programs to develop various signals. 2. Write programs to generate standard sequences . 3. Develop programs to verify convolution 4. Develop programs to design various filters.
22	**BTEC-513-18 Linear Integrated Circuits Laboratory**	Student will demonstrate the ability to: 1. study and investigate the configurations of Differential amplifiers. B.Tech Electronics & Communication Engineering (ECE) Study Scheme and Syllabus 2018 & Onwards Board of Studies Electronics & Communication Engineering, Affiliated colleges, IKGPTU (18/05/2021) 2. measure the performance parameters of am OP-Amp. 3. use Op-Amps for various applications.
34	**23BTEC-601-18Wireless Communication**	Students will demonstrate the ability to: 1.Understand the basic elements of Cellular Radio Systems and its design 2.Learn about the concepts Digital communication through fading multipath channels 3.Understand various Multiple Access techniques for Wireless communication 4.Know about the Wireless standards and systems
	BTCS-504-18Computer Networks	Students will demonstrate the ability to: 1.Explain the functions of the different layer of the OSI Protocol 2.Describe the function of each block of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs) 3.Develop the network programming for a given problem related TCP/IP protocol 4.Learn about DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.

35	**BTEC-602-18Optical Fibres and Communication**	Students will demonstrate the ability to: 1.Understand the basics of Optical Communication and Optical fibres 2.Learn about the Optical Transmitters and Receivers 3.Expalin the Light wave Architecture and systems 4.Ability to explain the manufacturing, modulation and wave mixing in Optical Communication
36	**BTEC-603-18Microwave and Antenna Engineering**	Students will demonstrate the ability to: 1.Understand the working and operation of various Microwave Tubes and Microwave Solidstate devices. 2.Learn about various important Microwave Components and the Microwave measurements that can be carried out. 3.Explain the basic concepts and types of Antennas and its regions. 4.Describe the important concepts of Antenna Arrays and Antenna Aperture.
37	**36 BTEC-906C-18CMOS and RF Circuit Design**	Students will demonstrate the ability to: 1. Get familiar with the concepts of CMOS and RF circuit designs. 2. Explore the design methods of RF receivers and transmitters. 3. Understand the concepts of Mixed signal design. 4. Use the design methods of Receivers and Transmitters
	BTEC-611-18Optical Fibres and Communication Lab	Students will demonstrate the ability to: 1. To perform experiments based on optical communication in order to understand in depth concepts of latest communication system. 2. To study various types of optical sources and light detectors 3. To know methods of slicing and connecting techniques of optical fibres 4. To study different types of losses in optical fibres . 5. To know applications of optical fibres.

38	**BTEC-612-18Microwave and Antenna Engineering Lab**	Students will demonstrate the ability to: 1. Learn about general Microwave components and Microwave bench. 2. Measure common parameters related to Microwave Oscillator(s). 3. Determine frequency and wavelength of waveguides. 4. Measure and plot radiation patterns of various types of Antennas
39	**BTEC-907C-18Robotics and Embedded Systems**	1. Ability to understand basic concept of robotics. 2. To analyze Instrumentation systems and their applications to various 3. To know about the differential motion, add statics in robotics 4. To know about the various path planning techniques. 5. To know about the dynamics and control in robotics industries.
40	**BTEC-908C-18VLSI Design**	Students will demonstrate the ability to: 1. Understand the concepts and various processes related to VLSI 2. Understand the VLSI Circuit Design processes and Gate level design 3. Learn about VHDL Synthesis and the tools involved 4. Describe about CMOS Testing techniques
	41 BTEC-909C-18Embedded System Design	Student will be able to • Learn about the basic architecture of 32-bit microcontrollers • Understand hardware interfacing concepts to connect digital as well as analog sensors while ensuring low power considerations. • Reviews and implement the protocols used by microcontroller to communicate with external sensors and actuators in real world. • Understand Embedded Networking concepts based upon connected MCUs
42	**BTMC-101-18Indian Constitution**	After the successful completion of the course students will be to understand the different dimensions of Indian Political System. They will be aware about their duties towards the fellow citizens.

		Students will be able to challenges of the democratic institutions and theoretical aspects of the state and its organs.
	43 BTMC-102-18Essence of Indian Traditional Knowledge	-Ability to understand connect up and explain basics of Indian traditional Knowledge in Modern scientific perspective. -Ability to understand connects up and explain basics of Indian traditional Knowledge in Modern scientific perspective.

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 IT Department (2011 Onwards)

1.	**BTCS301 Computer Architecture**	COUT1: Students should be able to have the knowledge of the computer registers and instructions for designing a basic computer system. COUT2: Students should be able to have a comprehend idea about the register transfer languages and operations for designing of a complete basic computer and it's working. COUT3: Students should be to apply the knowledge of input-output organisation and different modes of data transfer. COUT4: Students should be able to analyze the design of a pipelined CPU and the concept of Parallel processing. COUT5: Students should be able to learn about the designing of different types of control units.

		Students should be able to learn about the architecture of CPU, general register organization and stack organization. COUT6: Students should be able to analyze and evaluate the memory hierarchy performance.
2.	**BTAM302 Mathematics-III**	COUT1: Students should be able to define numerical techniques. COUT2: Students should able to explain the graphical representation of sine and cosine functions. COUT3: Students should be able to solve differential equations and real life problems with the help of numerical methods COUT4: Students should able to compare functions of real variables and complex variables. COUT5: Students should be able to develop an idea about the convergence of solution of heat equation, wave equation in one dimension and two dimension. COUT6: Students should able to judge the complexity of differential equation whether it is solve by ordinary method or with the help of Laplace transforms.
3.	**BTCS303 Digital Circuit and Logic Design**	COUT1: Students should be able to define the basis of digital circuits like number system and Boolean algebra. COUT2: Students should be able to describe the logic gates and their implementations. COUT3: Students should be able to solve algebraic manipulation/simplifications, and application of De-Morgans Theorem. COUT4: Students should be able to design combinational circuits and sequential circuits. Students should be able to classify memories, organization and their implementation. Cout5: Students should be able to do signal conversions i.e. from analog to digital and vice versa.
	BTCS308 Digital Circuit and Logic Design Lab	COUT1: Students should be able to get practical knowledge about the operation of logic gates. COUT2: Students should be able to get practical knowledge about the operation of half/ full adder and half/ full subtractor. COUT3: Students should be able to get practical knowledge about the operation of Multiplexer and Demultiplexer. COUT4: Students should be able to get practical knowledge about the operation of JK Flip Flop and D Flip Flop.
4.	**BTCS304**	COUT1: Students should be able to describe the usage of various data structures.

	Data Structures	COUT2: Students should be able to design simple algorithms for solving computing problems. COUT3: Students should be able to choose appropriate data structure as applied to specified problem definition. COUT4: Students should be able to apply operations like searching, insertion, deletion, traversing mechanism etc. on various data structures. COUT5: Students should be able to identify the associated algorithms operations and complexity. COUT6: Students should be able to develop computer programs to implement different data structures and related algorithms. COUT7: Students should be able to discuss the computational efficiency of the principal algorithms for sorting, searching and hashing.
	BTCS306 Data Structures Lab	COUT1: Students should able to design and apply appropriate data structure using simple algorithms for modeling and solving given computing problems. COUT2: Students should able to Understand and implement the both array based and linked-list based data structures, including singly, doubly, and circular linked-lists. COUT3: Students should able to Understand and implement the Stack data structure and stack operations. COUT4: Students should able to Understand and implement the both array based circular queue and linked-list based queue implementations. COUT5: Students should able to Understand and implement general tree data structures, including binary tree, both array based and reference based implementations.
5.	**BTCS305 Object Oriented Programming using C++**	COUT1: Students should be able to define the essential features and elements of the C++ programming language. COUT2: Students should be able to describe the concepts of class, object, function, constructor, instance, data abstraction, function abstraction, inheritance, overriding, overloading, and polymorphism. COUT3: Students should be able to solve various real world computing problems based on the concept of object oriented programming. COUT4: Students should be able to design programs using memory allocation and de-allocation procedures.

		COUT5: Students should be able to design Templates and use them in various programming languages. COUT6: Students should be able to design programs that can handle exceptions.
	BTCS309 Object Oriented Programming using C++ Lab	COUT1: Students should be able to construct programs using classes and objects. COUT2: Students should be able to create programs using constructors, destructors and initializer list. COUT3: Students should be able to develop operator overloading and type casting programs. COUT4: Students should be able to demonstrate inheritance, polymorphism. COUT5: Students should be able to design Templates and manipulation of files. COUT6: Students should be able to formulate file handling.
6.	**BTCS307 Institutional Practical Training**	COUT1: Students should be able to Identify, formulate and analyze complex engineering problem. COUT2: Students should be able to apply their knowledge and skills to IT environments COUT3: Students should be able to use computing and IT tools to improve efficiency and accuracy. COUT4: Students should be able to use softwares which are 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.
7.	**BTCS401 Operating System**	COUT1: Students should be able to define the basic concepts of operating system, its roles and functions, views and architecture. COUT2: Students should be able to describe the management activities of operating system such as process, memory, and file and device management. COUT3: Students should be able to solve various scheduling algorithms, deadlock related issues and apply algorithms to avoid deadlocks and will be able to construct page replacement algorithms. COUT4: Students should be able to analyze memory and device management strategies, compare and contrast paging and segmentation, analyze the need of virtual memory, protection and security.

		COUT5: Students should be able to design and develop various techniques to solve problems related to process and memory management. COUT6: Students should be able to evaluate various case studies of LINUX/ UNIX and windows based operating systems.
	BTCS406 Operating System Lab	COUT1: Students should be able to get practical knowledge of partitioning a hard disk, formatting and installation of windows xp. COUT2: Students should be able to install VMWare software and to create a virtual machine by installing Linux on VMWare. COUT3: Students should be able to get knowledge about various Linux commands. COUT4: Students should be able to get knowledge about shell programming basics and should be able to create shell programs.
8.	**BTCS402 Discrete Structure**	COUT1: Students should be able to define the concepts of sets, relations and functions. COUT2: Students should be able to describe concepts of counting by permutations and combinations. COUT3: Students should be able to solve various types of recurrence relations with the help of generating functions. COUT4: Students should be able to apply the concept of logical equivalence and its relationship to logic circuits and Boolean functions. COUT5: Students should be able to analyze the concepts of graph theory to provide solutions for shortest path applications in computer networks.
9.	**BTCS403 Computer Network-1**	COUT1: Students Should be able to describe various network types. COUT2: Students should be able to explain flow control and buffering techniques and TCP/IP Protocols. COUT3: Students should be able to explain various cables used in Networking. COUT4: Students should be able to describe various protocols like ALOHA and CSMA. COUT5: Students should be able to define World Wide Web (WWW), Domain Name System (DNS), E-mail, File Transfer Protocol (FTP), Introduction to Network security COUT6: Students should be able to use various error correction and detection methods.

		COUT7: Students should be able to compare and analyze various congestion control and routing Algorithms
	BTCS407 Computer Network-I Lab	COUT1: Students should be able to Know and Apply pieces of hardware and software to make networks more efficient, faster, more secure, easier to use, able to transmit several simultaneous messages, and able to interconnect with other networks. COUT2: Students should be able to Differentiate the various types of network configurations and applying them to meet the changing and challenging networking needs of organizations. COUT3: Students should be able to define the different protocols, software, and network architectures.
10.	**BTCS404 Microprocessor and Assembly Language Programming**	COUT1: Students should be able to recognise basic concepts of microprocessor and assembly language programming. COUT2: Students should be able to describe the architecture of the Intel 8085, 8251,8255, 8086,Motorola 68000 and Pentium microprocessor and its various applications COUT3: Students should be able to use the various instructions & data formats and addressing modes like data transfer operations, arithmetic operations, logical operations and branch operations of 8085 and 8086 microprocessors. COUT4: Students should be able to develop the simple arithmetic and logical programs with the help of 8085 and 8086 microprocessor kit COUT5: Students should be able to work with seven segment LED, MCTS, traffic light system and stepper motor controller.
	BTCS408 Microprocessor and Assembly Language Lab	COUT1: Students should be able to understand the basics of multiprocessor about what a microprocessor is and how it works. COUT2: Students should be able to understand the major components of microprocessor include memory (RAM & ROM), I/O devices and communication buses, and its purpose. COUT3: Students should be able to understand the numbering system, instruction sets and various languages used in microprocessor. COUT4: Students should be able to perform the primary calculations such as addition, subtraction, multiplications and complement using microprocessor.
11.	**BTCS405**	COUT1: Students should be able to describe various system programs.

	System Programming	COUT2: Students should be able to assimilate as to how system programs like assemblers and compilers are able to translate source code. COUT3: Students should be able to create programs in labs to implement some data structures and algorithms behind system programs like assemblers and compilers. COUT4: Students should be able select appropriate system-program design strategies to implement specific system software example weather to use single pass or two pass for assembler. COUT5: Students should be able to design and implement system software.
	BTCS409 System Programming Lab	COUT1: Students should have a good knowledge of System programming tasks of a system programmer. COUT2: Students should design the methods of developing system level software (e.g., compiler, and networking software) COUT3: Students should use the knowledge and techniques learnt to develop solutions to real world problems
12.	**BTCS501 Computer Networks-II**	COUT1: Students should be able to define network security aspects and network security attacks. COUT2: Students should be able to define cellular radio concepts such as frequency reuse, hand-off, interference between mobile and base station and capacity of cellular system. COUT3: Students should be able to explain Internet key exchange, simple key management protocol, photuris. COUT4: Students should be able to use modern engineering tool to capture the network traffic. COUT5: Students should be able to compare and analyze IPV4 and IPV6. COUT6: Students should be able to analyze the different routing and MAC protocols of wireless mobile ad hoc network COUT7: Students should be able to learn and design the wireless communication system, 2G cellular system, and 3G cellular systems.

	BTCS507 Computer Networks-II Lab	COUT1: Students should be able to configure local area network using IPv4 and IPV6. COUT2: Students should be able to implement wireless ad hoc networks. COUT3: Students should be able to apply knowledge and interpret the working of packet capture software wireshark. COUT4: Students should be able to configure wireless local loop, wireless access point and wireless local area network. COUT5: Students should be able to create personal area network. COUT6: Students should be able to set up VMware and NS2.
13.	**BTIT503 Database Management System**	COUT1: Students should be able to identify fundamental concepts and techniques of related database management, databases technology, why database are used and the basic components of a database. COUT2: Students should be able to recognize the relational model and define key relational terminology and principles COUT3: Students should be able to demonstrate the use of structured query Language, an international standard for creating and processing relational databases. COUT4: Students should be able to describe Data modeling and the entity- relationship model and demonstrate their understanding of these two types of models. COUT5: Students should be able to transform data model into a relational database design. COUT6: Students should be able to recognize and discuss the components and responsibilities of database management.
	BTIT505 Database Management System lab	COUT1: Students should be able to understand installation of SQL Server, Data types and various SQL statements. COUT2: Students should be able to understand Aggregate Functions, Nested Queries, Joins, and Sequences. COUT3: Students should Be able to understand Database Security and Privileges and Referencing Non-SQL parameters COUT4: Students should be able to understand Stored Procedures and Exception Handling and Cursor Management in PL/SQL
14.	**BTIT502 Programming in Java**	COUT1: Students will be able to understand the features of Java such as operators, classes, objects, inheritance, packages and exception handling COUT2: Learn latest features of Java like garbage collection, Console class, Network interface, APIs

		COUT3: Acquire competence in Java through the use of multithreading, applets COUT4: Get exposure to advance concepts like socket and database connectivity
	BTIT506 Programming in Java Lab	COUT1: Implement the features of Java such as operators, classes, objects, inheritance, packages and exception handling COUT2: Design problems using latest features of Java like garbage collection, Console class, Network interface, APIs COUT3: Develop competence in Java through the use of multithreading, Applets etc. COUT4: Apply advance concepts like socket and database connectivity, and develop project based on industry orientation.
15.	**BTIT504 Cyber Laws and IPR**	COUT1: Students should be able to understand the various digital crimes and comprehend the basic features of these crimes. COUT2: Students should be able to understand Analyze how laws are enforced in the digital and cyber environment and the challenges that are forced in their enforcement. COUT3: Students should be able to understand to identify what is a Protectable Subject matter under Copyright Laws and what is the manner of obtaining Copyright protection. COUT4: Students should be able to gain expert knowledge in application of various provisions of Copyright law to determine the rights to which the IP holder will be entitled.COUT5: Students should be able to implement small programs to understand how various algorithms are used to implement a raster- scan graphics package.
16.	**BTIT501 System Analysis and Design**	COUT1: Students should be able to understand the basics concept of various peripherals devices. COUT2: Students should be able to Explain different memory and storage devices in computer peripherals, Various parallel and serial interface protocols and various communication protocols/interfacing and bus systems. COUT3: Students should be able to compare and put specification of computer/peripherals.. COUT4: Students should be able to perform installation configuration and upgrading of various peripherals devices. COUT5: Students should be able to be familiar with the different types of interrupt structures. Students should be able to Diagnose and troubleshoot problems with microcomputer peripherals.

17.	**BTIT507 Industrial 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 softwares which are 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.
18.	**BTIT601 Network Programming**	COUT1: Students should be able to demonstrate advanced knowledge of networking. COUT2: Students should be able understand the key protocols which support the Internet. COUT3: Students should be able to be familiar with several common programming interfaces for network communication. COUT4: Students should be able to demonstrate advanced knowledge of programming for network communications.
	BTIT604 Network Programming Lab	COUT1:Students should be able to have a detailed knowledge of the TCP/UDP Sockets. COUT2:Students should be able to make use of various solutions to perform inter-process communications COUT3:Students should be able to apply knowledge of Unix/Linux operating systems to build robust client and server software for this environment;
19.	**BTCS603 Web Technologies**	COUT1: Understand and apply the knowledge of web technology stack to deploy various web services. COUT2: Students should be able to Analyze and evaluate web technology components for formulating web related problems. COUT3: Students should be able to Design and develop interactive client server internet application that accommodates user specific requirements and constraint analysis. COUT4: Program latest web technologies and tools by creating dynamic pages with an understanding of functions and objects.

	BTCS604 Web Technologies Lab	COUT1: Students should be able Create XML documents and Schemas. COUT2: Students should be able to Build interactive web applications using AJAX COUT3: Students should be able to Program latest web technologies and tools by creating dynamic pages with an understanding of functions and objects. COUT7: Students should be able to describe web databases.
20.	**BTCS603 Software Engineering**	COUT1: Students should be able to understand the basics of S/W engineering. COUT2: Students should be able to classify the various models. COUT3: Students should be able to apply the concept of project management. COUT4: Students should be able to analyze the software using various testing methods. COUT5: Students should be able to do quality control. COUT6: Students can evaluate the Software Engineering process for the software system.
	BTCS606 Software Engineering Lab	COUT1: Students should be able to analyses and develop core skills that gives students the ability to successfully complete their planning problems COUT2: Students should be able to manage the project effectively so that completion of project must be achieved in time. COUT3: Students should be able to apply reasoning informed by contextual knowledge and the consequent responsibilities relevant to professional engineering practice COUT4: Students should be able to measure the quality, cost and effectiveness of the project and the processes. COUT5: Students should be able to generate effective report and design documentation, make effective presentations COUT6: Students should be able to analyses and develop core skills that gives students the ability to successfully complete their planning problems
21.	**BTCS912 Cloud Computing**	COUT1: Students should be able to describe the basics of Cloud Computing COUT2: Students should be able to interprets, the Cloud service delivery models. COUT3: Students should be able apply the Cloud Computing methodology in IT.

		COUT4: Students should be able to analyze the Security in Cloud Computing. COUT5: Students should be able to identify the Cloud deployment Scenarios. COUT6: Students should able to designs the theoretical concepts learned by studying sufficient number of Case Studies.
22.	**BTIT602 Information Security and Risk management**	COUT1: Students should be able to describe the basics of Information Security. COUT2: Students should be able to classify the Classical Encryption techniques. COUT3: Students should be able to employ the implementation of Encryption techniques. COUT4: Students should be able to outline the requirements to secure information. COUT5: Students should be able to categorize various information sharing methods and their threats. COUT6: Students should be able to select the various secure transmission mechanisms.
23.	**HU-251 Human Resource Management (Open Elective)**	COUT1: Students should be able to attain knowledge of human resource functions within organizations. COUT2: Students should be able to summarize and restate the current issues, trends, practices, and processes in HRM. COUT3: Students should be able to discuss the Problem related to human resource challenges. COUT4: Students should be able to analyze the effective written and oral communication skills. COUT5: Students should be able to generalize various aspects of integration and maintenance function of HRM
24.	**BTIT701 Building Enterprise Applications**	COUT1: Students should be able to Familiarize with concept of Enterprise Analysis and Business Modeling. COUT2: Students should be able Understand requirements validation, planning and estimation COUT3: Students should be able to Understand the importance of application framework and designing other application components.
	BTIT704 Building Enterprise	COUT1: Students should be able to Understand different testing involved with enterprise application and the process of rolling out an enterprise application.

	Applications Lab	COUT2: Students should be able to Familiarize with concept of Enterprise Analysis and Business Modeling. COUT3: Students should be able to Perform Code review, Code analysis, build process.
25.	**BTIT702 Software Project Management**	COUT1 Understanding of Software process models such as the waterfall, prototyping and spiral models COUT2: Understanding of the role of project management including planning, scheduling, risk management, etc. COUT3: Understanding of object models, data models, context models and behavioral models. COUT4: Understanding of software testing approaches such as unit testing, integration testing and system testing
26.	**BTCS703 Project**	COUT1: Students should be able to analyses and develop core skills that gives students the ability to successfully complete their planning problems COUT2: Students should be able to manage the project effectively so that completion of project must be achieved in time. COUT3: Students should be able to apply reasoning informed by contextual knowledge and the consequent responsibilities relevant to professional engineering practice COUT4: Students should be able to measure the quality, cost and effectiveness of the project and the processes. COUT5: Students should be able to generate effective report and design documentation, make effective presentations
27.	**BTCS-906 Object Oriented Analysis and Design**	COUT1: Students should be able to know about object oriented systems and its concepts- classes, objects, abstraction, inheritance etc. COUT2: Students should learn about Iterative and incremental development approach of software development, the unified process and its phases COUT3: Students should be able to know about UML and various concepts and diagrams of UML in detail. COUT4: Students should be able to know about various design patterns- GoF and GRASP, their types and also about anti patterns. COUT5: 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. COUT6: Students should be able to know about aspect

		oriented and service oriented approach of software development.
28.	**BTCS916 Enterprise Resource Planning**	COUT1: Students should be able To know the basics of ERP COUT2: Students should be able to understand the key implementation issues of ERP COUT3: Students should be able to know the business modules of ERP COUT4: Students should be able to T be aware of some popular products in the area of
29.	**BTIT801 Software Training**	COUT1: Students should be able to define compelling and viable problems COUT2: Students should be able to develop skills to create practical solutions to identified problem. COUT3: Students should be able to use software lifecycle model and other artifacts appropriate for problem COUT4: Students should be able to identify and master tools required for the project COUT5: Students should be able to plan and work systematically towards completion of a project work. COUT6: Students should be able to develop the ability to explain and defend their work in front of an evaluation panel
30.	**BTIT802 Industry oriented Project Training**	COUT1: Students should be able to apply knowledge of mathematics, science, engineering fundamentals and engineering specialization to the solution of complex engineering problems. COUT2: Students should be able to apply their knowledge and skills relevant to their area of study on real world scenario. COUT3: Students should be able to relate the knowledge and skills acquired at the workplace, to their on-campus studies. COUT4: Students should be able to compete effectively in the job market by their requisite knowledge, skills, attitudes and practical experience. COUT5: Students should be able to take decisions on industrial environment. COUT6: Students should be able to work in teams, both as a member and as a leader, appreciates participatory roles, develops skills in inter-personal dealings

Course Outcomes of IT Department (2018 Onwards)

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	**BTIT301-18 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.
	BTIT303-18 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.
2.	**BTIT302-18 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.
	BTIT304-18 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.
3.	**BTES301-18 Computer 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.
4.	**BTAM304-18 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.
5.	**BTES301-18**	CO1:Demonstrate the operation of simple digital gates, identify

	Digital Electronics	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.
	BTES302-18 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
6.	**Summer Institutional Training**	COUT1: Students should be able to Identify, formulate and analyze complex engineering problem. COUT2: Students should be able to apply their knowledge and skills to IT environments COUT3: Students should be able to use computing and IT tools to improve efficiency and accuracy. COUT4: Students should be able to use softwares which are 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.
7.	**BTIT401-18 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.

	BTIT404-18 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.
8.	**BTIT402-18 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.
	BTIT405-18 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.
9.	**BTIT403-18 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.
	BTIT406-18 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.
10.	**EVS101-18 Environmental Studies**	CO1: Students should be able to attain knowledge of components of environment and multidisciplinary nature of the subject. CO2: Students should be able to get awareness regarding importance, types and conservation of natural resources. CO3: Students should be able to get an overview of structure and function of ecosystem as well as the deep knowledge of

		biodiversity, its importance for mankind and conservation techniques. CO4: Students should be able to analyze the types and causes of pollution, solid waste management, nuclear waste and e waste and how to deal with natural disasters. CO5: Students should be able to get clear idea of sustainable development, various strategies to conserve water such as watershed management and rainwater harvesting, value education, human rights and environmental ethics. CO6: Students should be able to get aware of population related problems in India and various programmes launched by Indian government related to population and environment protection.
11.	**HSMC101-18 Development of Societies**	CO1: Students should be able to attain knowledge of multidisciplinary nature of the subject. CO2: Students should be able to understand the Relation between Human being and Society. CO3: Students should be able to get aware of Different models of Governing system and their comparative study
12.	**BTCS401-18 Discrete Mathematics**	CO1. To be able to express logical sentence in terms of predicates, quantifiers, and logical connective. 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.
13.	**BTIT501-18 Formal Language &**	CO1: Understand a formal notation for strings, languages and machines. CO2: Design finite automata to accept a set of strings of a language.

	Automata Theory	CO3: Design context free grammars to generate strings of context free language. CO4: Write the hierarchy of formal languages, grammars and machines. CO5: Distinguish between computability and non-computability and Decidability and undecidability.
14.	**BTIT502-18 Database Management Systems**	CO1: Write relational algebra expressions for that 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.
	BTIT505-18 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 datatypes. 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.
15.	**BTIT503-18 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
	BTIT506-18 Prog. In Java lab	CO1. Implement the features of Java such as opeartors, 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.

16.	**BTIT504-18 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.
	BTIT507-18 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, and testing
17.	**BTIT509-18 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.
	BTIT513-18 Cyber laws and IPR lab	CO1: Students should be able to understand working of various broad band communication devices. CO2: Students should be able to implement one wireless application protocol and symmetric encryption. CO3: Students should be able to implement SET protocol.
18.	**HSMC122-18 Universal Human values-2**	CO1: Students should be able to attain knowledge of human resource functions within organizations. CO2: Students should be able to summarize and restate the current issues, trends, practices, and processes in HRM. CO3: Students should be able to discuss the Problem related to human resource challenges.

		CO4: Students should be able to analyze the effective written and oral communication skills. CO5: Students should be able to generalize various aspects of integration and maintenance function of HRM
19.	**Industrial 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. COUT3: Students should be able to use computing and IT tools to improve efficiency and accuracy. CO4: Students should be able to use softwares which are 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.
20.	**BTCS601-18 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.
	BTCS604-18 Compiler Design Lab	CO1: Students should be able to design a lexical analyser. CO2: Students should be able to identify whether a given line is a comment or not, whether a given identifier is valid or not. CO3: Students should be able to implement the lexical analyzer using JLex, flex or other lexical analyzer generating tools
21.	**BTCS602-18 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 uncertainity. 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
	BTCS 605-18 Artificial Intelligence Lab	CO1: Students should be able to conduct uninformed and informed search. CO2: Students should be able to construct a Bayesian network from given data. CO3: Students should be able to reinforcement learning in a grid world.

22.	**BTCS 618-18 Machine Learning**	CO1: Analyse methods and theories in the field of machine learning. CO2: Analyse 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
	BTCS619-18 Machine Learning Lab	CO1: Students should be able to Implement data pre-processing. CO2: Students should be able to Simulate Multiple Linear Regression. CO3: Students should be able to Deploy Support Vector Machine, Apriori algorithm
23.	**BTCS404 Microprocessor and Micr-controller**	CO1: Students should be able to recognise basic concepts of microprocessor and assembly language programming. CO2: Students should be able to describe the architecture of the Intel 8085, 8251,8255, 8086,Motorola 68000 and Pentium microprocessor and its various applications CO3: Students should be able to use the various instructions & data formats and addressing modes like data transfer operations, arithmetic operations, logical operations and branch operations of 8085 and 8086 microprocessors. CO4: Students should be able to develop the simple arithmetic and logical programs with the help of 8085 and 8086 microprocessor kit CO5: Students should be able to work with seven segment LED, MCTS, traffic light system and stepper motor controller.
24.	**BTIT610-18 Cryptography and Network Security**	CO1: Formulate information security governance, and related legal and regulatory issues. CO2. Devices how threats to an organization are discovered, analyzed, and dealt with. CO3. Evaluate network security threats and countermeasures.
	BTIT618-18 Cryptography and Network Security	CO1. Construct network security designs using available secure solutions (such as PGP, SSL, IPSec, etc) CO1. Acquire the knowledge of advanced security issues and technologies (such as DDoS attack detection and containment, and anonymous communications)

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.

PSO3: 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	**BTAM301 Engineering Mathematics-III:**	**COUT 1** Understand the basic results on vector function, their properties and fields so as to apply them for solving problems of engineering. **COUT 2** Find length, area and volume using integral calculus that is an important application in engineering. **COUT 3** Solve some real problems in engineering using Gauss Divergence and Stokes' theorem **COUT 4** To formulate Laplace transform of functions and its applications to solve differential equations that form real life problems in engineering. **COUT 5** To formulate Fourier Series, its properties and its applications to solve problems in engineering.
2	**BTCE301 Fluid Mechanics-I:**	**COUT 1** Understand the basic terms used in fluid mechanics and its broad principles **COUT 2**. Estimate the forces induced on a plane/ submerged bodies **COUT 3** Formulate expressions using dimensionless approach and able to determine design parameters by creating replica of prototype at appropriate scale. **COUT 4** Apply the continuity, momentum and energy principles and design the pipelines used for water supply or sewage under different situation. **COUT 5** Calculate drag force exerted by fluid on the body of varying shapes and able to minimize them. **COUT 6** Design and addressing problems in open channel (lined/ unlined) of different shapes and size optimally as per site condition.
	BTCE302 Rock Mechanics & Engineering Geology:	**COUT 1** Geological classification of rocks, engineering classifications and index properties of intact rocks. **COUT 2** Characterization of rock discontinuities and their fundamental properties. Classification of rock masses. **COUT 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 **COUT 4** Strength and deformation behaviour of rock masses. The phenomenon and mechanism of time-dependent deformation of rocks and the measurement and interpretation of time-dependent deformation rock properties.

	BTCE304 Surveying:	**COUT 1** Understand the concept, various methods and techniques of surveying **COUT 2** Compute angles, distances and levels for given area . **COUT 3** Apply the concept of tachometry survey in difficult and hilly terrain. **COUT 4** Select appropriate instruments for data collection and survey purpose **COUT 5** Analyze and retrieve the information from remotely sensed data and interpret the data for survey. 6. Understand the concepts related to GIS and GPS and analyze the geographical data.
	BTCE305 Building Material & Construction:	**COUT 1** Interpret the different terms related to fluids. **COUT 2** Calculate the pressure exerted by fluids on the walls of containers. **COUT 3** Calculate discharge through pipes, irrigation channels, water supply pipe lines. **COUT 4** Use different flow measurement devices like venturimeter, mouthpiece, notches, weir, orificemeter Calculate size of the pipe for carrying a particular discharge. **COUT 5** Prepare the details like dimensions, slope of the irrigation, canals and water courses Differentiate between different type of water pumps used in the field. **COUT 6** Measure the loss of head in pipes and channels.
4	**BTCE306 Fluid Mechanics Lab-I**	**COUT 1** Select appropriate pressure measuring device under different condition of flow. **COUT 2** Determine the stability of a floating body. **COUT 3** Understand and apply Bernoulli's theorem practically. **COUT 4** Find discharge of fluid through pipe, orifices and in open channel. **COUT 5** Estimate the major and minor losses in pipe. **COUT 6** Estimate the various elements and energy losses in hydraulic jump.
	BTCE-307 Strength of Material Lab:	**COUT 1** Determination of physical properties of steel including strength and ductility. **COUT 2** Study of tensile and compressive stress-strain behaviour of steel. **COUT 3** Compression test on brick. **COUT 4** Development of shear stress-strain curve for steel in torsion. **COUT 5** Determination of hardness of a material by Rockwell and Brinell hardness testingmachine. **COUT 6** Determination of impact strength of a material by Izod and Charpy tests.

		COUT 7 Determination of bending strength of a wooden beam specimen. **COUT 8** Determination of fatigue strength of a material. **COUT 9** Study of behavior of columns and struts with different end conditions. **COUT 10** To verify the moment area theorem for slope and deflection of a given beam.
5	**BTCE-305 Surveying Lab:**	**COUT 1** Visualize things/ concepts and express the thoughts in the form of sketches, models, etc **COUT 2** Create a well organized document using computers. **COUT 3** Work in teams . **COUT 4** Acknowledge the work of other in a consistent manner. **COUT 5** Understanding of ethical and professional issues . **COUT 6** Demonstrate effective oral communication and presentation skills.
6	**BTCE-401 Geomatics Engineering:**	**COUT 1** Understand the concept, various methods and techniques of surveying **COUT 2** Compute angles, distances and levels for given area **COUT 3** Apply the concept of tachometry survey in difficult and hilly terrain. **COUT 4** Select appropriate instruments for data collection and survey purpose **COUT 5** Analyze and retrieve the information from remotely sensed data and interpret the data for survey. **COUT 6** Understand the concepts related to GIS and GPS and analyze the geographical data.
7	**BTCE-402 Construction Machinery & Works Management:**	**COUT 1** An understanding of modern construction practices **COUT 2** A good idea of basic construction dynamics- various stakeholders, project objectives, **COUT 3** processes, resources required and project economics **COUT 4** A basic ability to plan, control and monitor construction projects with respect to time vand cost **COUT 5** An idea of how to optimise construction projects based on costs **COUT 6** An idea how construction projects are administered with respect to contract structures and issues. **COUT 7** An ability to put forward ideas and understandings to others with effective communication processes.

	BTCE-403 Design Of Concrete Structures-I:	**COUT 1** On the successful completion of course the student will be able to understand the design of special component of pile and pile cap, **COUT 2** Student are able to design the deep beam, shear wall, rise tread and curved staircase design. **COUT 3** Student are able to understand the importance of Reinforcement detailing, and ductile detailing.
8	**BTCE- 404 Fluid Mechanics-II:**	**COUT 1** Understand the basic terms used in fluid mechanics and its broad principles **COUT 2** Estimate the forces induced on a plane/ submerged bodies **COUT 3** Formulate expressions using dimensionless approach and able to determine design parameters by creating replica of prototype at appropriate scale. **COUT 4** Apply the continuity, momentum and energy principles and design the pipelines used for water supply or sewage under different situation. **COUT 5** Calculate drag force exerted by fluid on the body of varying shapes and able to minimize them. **COUT 6** Design and addressing problems in open channel (lined/ unlined) of different shapes and size optimally as per site condition.
	BTCE-405 Irrigation Engineering –I:	**COUT 1** Understand the interaction among various processes in the hydrologic cycle. **COUT 2** Calculate the average annual rainfall of any area using the rain gauge data and inter-relations of various parameters as infiltration, evapotranspiration etc **COUT 3** Understand the various component of hydro graphs and able to estimate the run off. **COUT 4** Find the water requirement for different crops and able to proposed appropriate method of applying water. **COUT 5** Understand the distribution system of canal and various components of irrigation system. **COUT 6** Classify dams and spillways, their problems and able to determine forces exerted by fluid on dams.
9	**BTCE- 406 Structural Analysis- I:**	**COUT 1** The students will be able to apply their knowledge of structural mechanics in addressing design problems of structural engineering **COUT 2** They will possess the skills to analyse and design concrete and steel structures **COUT 3** They will have knowledge of structural engineering.
10	**BTCE-407 Concrete**	**COUT 1** Evaluate properties of building materials, such as cement and aggregates.

	Technology Lab	**COUT 2** Conduct experiments and check the acceptance criteria (if any). **COUT 3** Design concrete mixes as per BIS provisions. **COUT 4** Analyze the properties of concrete in fresh and hardened state. **COUT 5** Create a well organized document and present the results appropriately. **COUT 6** Understand and apply non destructive testing (NDT) for evaluating concrete quality.
	BTCE-408 Structural Analysis Lab:	**COUT 1** Deflection of a simply supported beam and verification of Clark-Maxwell's theorem. **COUT 2** To determine the Flexural Rigidity of a given beam. **COUT 3** Deflection of a fixed beam and influence line for reactions **COUT 4** Deflection studies for a overhang beam and influence line for reactions. **COUT 5** Structural Drawings of Reinforced Concrete Elements such as Beams, Slabs. **COUT 6** Structural Drawings of Steel Elements such as Connections, Tension Members, Compression Members, Beams
11	**BTCE 501 Design of Steel Structures – I**	**COUT 1** The students will be able to apply their knowledge of structural mechanics in addressing design problems of structural engineering **COUT 2** They will possess the skills to analyse and steel structures. **COUT 3** They will have knowledge of structural engineering.
12	**BTCE-502 Geotechnical Engineering**	**COUT 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. **COUT 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 **COUT 3** Apply the various specifications of compaction of soils in the construction of highways and earthen dams. **COUT 4** Able to apply the knowledge of consolidation, soil deformation parameters, and calculate settlement magnitude and rate of settlement. **COUT 5** Design the embankment slopes and check the stability of finite slopes.

13	**BTCE-503 Structural Analysis-II**	**COUT 1** To apply the knowledge for analysis and design of various components of a plate girder. **COUT 2** To analyse , evaluate and design the different types of beam-column connections. **COUT 3** To design the column bases and footings for a steel structure under various loading conditions. **COUT 4** To analyse the loads and design various elements of industrial buildings. **COUT 5** To demonstrate the basic knowledge of plastic analysis of simple steel elements.
14	**BTCE-504 Transportation Engineering – I**	**COUT 1** Appreciate the importance of different modes of transportation and characterize the road transportation. **COUT 2** Alignment and geometry of pavement as per Indian Standards according to topography. **COUT 3** Assess the properties of highway materials in laboratory **COUT 4** Understand the importance of railway infrastructure planning and design. **COUT 6** Identify the functions of different component of railway track. 6. Outline the importance of Airport Infrastructure.
	BTCE-505 Environmental Engineering - I	**COUT 1** Understand the impact of humans on environment and environment on humans **COUT 2** Be able to identify and value the effect of the pollutants on the environment: atmosphere, water and soil. **COUT 3** Be able to plan strategies to control, reduce and monitor pollution. **COUT 4** Be able to select the most appropriate technique for the treatment of water, wastewater ,solid waste and contaminated air. **COUT 5** Be conversant with basic environmental legislation.
15	**BTCE-506 Transportation Engineering Lab**	**COUT 1** Characterize the pavement materials as per the Indian Standard guidelines. **COUT 2** Evaluate the strength of subgrade soil by CBR test. **COUT 3** Conduct experiments to evaluate aggregate properties. **COUT 4** Determine properties of bitumen material and mixes **COUT 5** Evaluate the pavement condition by rough meter and Benkelman beam test. **COUT 6** Create a well organized report and present the results appropriately.
	BTCE-507 Geotechnical Engineering Lab	**COUT 1** Determination of in-situ density by core cutter method and Sand replacement method. **COUT 2** Determination of Liquid Limit & Plastic Limit. **COUT 3** Determination of specific gravity of soil solids by pyconometer method.

		COUT 4 Grain size analysis of sand and determination of uniformity coefficient (Cu) and coefficient of curvature (Cc). **COUT 5** Compaction test of soil.
16	**BTCE-508 Computer Aided Structural Drawing**	**COUT 1** Visualize things/ concepts and express the thoughts in the form of sketches, models, etc **COUT 2** Create a well organized document using computers **COUT 3** Work in teams **COUT 4** Acknowledge the work of other in a consistent manner **COUT 5** Understanding of ethical and professional issues **COUT 6** Demonstrate effective oral communication and presentation skills.
	BTCE-509 Survey Camp	**COUT 1** Hands-on-training of modern surveying equipment such as Digital Theodolite, Total Stations, Autolevel, and GPS. **COUT 2** On-site application of traversing, etc. for preparation of topographical maps of an area.
17	**BTCE601 DESIGN OF CONCRETE STRUCTURES -II**	**COUT 1** To apply the loads on building frames and analyse them using direct and indirect methods. **COUT 2** To analyse the concrete components i.e. continuous beams, flat slabs, tanks and retaining walls, etc **COUT 3** To design and detail the concrete components i.e. curved beams, flat slabs, tanks and retaining walls, etc **COUT 4** To analyse and design the special foundations i.e. raft, pile and machine foundations.
	BTCE-602 ELEMENTS OF EARTHQUAKE ENGINEERING	**COUT 1** Appreciate the role of earthquake forces in structural design of building. **COUT 2** Apply various codal provisions related to seismic design of buildings. **COUT 3** Acquire new basic knowledge in earthquake engineering.

18	**BTCE-604 NUMERICAL METHODS IN CIVIL ENGINEERING**	**COUT 1** Understand the methods of surface and subsoil exploration and to prepare investigation report. **COUT 2** Estimate the stresses in soils and bearing capacity of soil for shallow foundation. **COUT 3** Design various types of shallow foundation and to estimate settlement. **COUT 4** Apply the concepts of deep foundation and solve problems related with pile foundation.
19	**BTCE-604 NUMERICAL METHODS IN CIVIL ENGINEERING**	**COUT 1** 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 **COUT 2** Ability to apply numerical methods to obtain approximate solutions to mathematical problems. **COUT 3** Ability to analyze and evaluate accuracy of various numerical methods and their applicability **COUT 4** Exposure to established and advanced numerical methods like Finite Element Method, Mesh free Methods and Boundary Element Methods.
	BTCE-605 PROFESSIONAL PRACTICE	**COUT 1** To make the students understand the types of roles they are expected to play in the **COUT 2** society as practitioners of the civil engineering profession **COUT 3** To develop some ideas of the legal and practical aspects of their profession.
20	**BTCE-606 ENVIRONMENTAL ENGINEERING - II**	**COUT 1** Understand the impact of humans on environment and environment on humans **COUT 2** Be able to identify and value the effect of the pollutants on the environment: atmosphere, water and soil. **COUT 3** Be able to plan strategies to control, reduce and monitor pollution. **COUT 4** Be able to select the most appropriate technique for the treatment of water, wastewater ,solid waste and contaminated air. **COUT 5** Be conversant with basic environmental legislation.
21	**BTCE-607 ENVIRONMENTAL ENGINEERING LABORATORY**	**COUT 1** To measure the pH value of a water/waste water sample. **COUT 2** To determine optimum Alum dose for Coagulation. **COUT 3** To find MPN for the bacteriological examination of water. **COUT 4** To find the turbidity of a given waste water/water sample **COUT 5** To find B.O.D. of a given waste water sample. **COUT 6**To measure D.O. of a given sample of water.

22	**BTCE-608 COMPUTER AIDED STRUCTURAL DRAWING - II**	**COUT 1** Visualize things/ concepts and express the thoughts in the form of sketches, models, etc **COUT 2** Create a well organized document using computers **COUT 3** Work in teams **COUT 4** Acknowledge the work of other in a consistent manner **COUT 5** Understanding of ethical and professional issues **COUT 6** Demonstrate effective oral communication and presentation skills.
23	**BTCE-701 SOFTWARE AND INDUSTRIAL TRAINING**	**COUT 1** Students will be able to define compelling and viable problems . **COUT 2** Students will be able to develop skills to create practical solutions to identified problem. **COUT 3** Students will be able to interpret the software lifecycle model and other artifacts appropriate for problem. **COUT 4** Students will be able to identify and master tools required for the project. **COUT 5** Students will be able to plan and work systematically towards completion of a project works. **COUT 6** Students will be able to develop the ability to explain and defend their work in front of an evaluation panel.
24	**BTCE 801 Design of Steel Structures-II:**	**COUT 1** To apply the knowledge for analysis and design of various components of a plate girder. **COUT 2** To analyse , evaluate and design the different types of beam-column connections. **COUT 3** To design the column bases and footings for a steel structure under various loading conditions. **COUT 4** To analyse the loads and design various elements of industrial buildings. **COUT 5** To demonstrate the basic knowledge of plastic analysis of simple steel elements.
25	**BTCE 802 Disaster Management:**	**COUT 1** Identify various types of disasters, their causes, effects & mitigation measures. **COUT 2** Demonstrate the understanding of various phases of disaster management cycle and create vulnerability and risk maps. **COUT 3** Understand the use of emergency management system to tackle the problems. **COUT 4** Discuss the role of media, various agencies and organisations for effective disaster management. **COUT 5** Design early warning system and understand the utilization of advanced technologies in disastermanagement. **COUT 6** Compare different models for disaster management and plan & design of infrastructure for effective disaster management.

	BTCE-803Irrigation Engineering-II:	**COUT 1** Understand the interaction among various processes in the hydrologic cycle. **COUT 2** Calculate the average annual rainfall of any area using the rain gauge data and inter-relations of various parameters as infiltration, evapotranspiration etc **COUT 3** Understand the various component of hydro graphs and able to estimate the run off. **COUT 4** Find the water requirement for different crops and able to proposed appropriate method of applying water. **COUT 5** Understand the distribution system of canal and various components of irrigation system. **COUT 6** Classify dams and spillways, their problems and able to determine forces exerted by fluid on dams.
26	**BTCE-804Transportation Engineering-II:**	**COUT 1** Appreciate the importance of different modes of transportation and characterize the road transportation. **COUT 2** Alignment and geometry of pavement as per Indian Standards according to topography. **COUT 3** Assess the properties of highway materials in laboratory **COUT 4** Understand the importance of railway infrastructure planning and design. **COUT 6** Identify the functions of different component of rail.
	BTCE- 810 Ground Improvement Techniques:	**COUT 1** Role of ground improvement in foundation engineering. **COUT 2** Geotechnical problems in alluvial, lateritic and black cotton soils,. **COUT 3** Methods of ground improvement Selection of suitable ground improvement techniques based on soil conditions.
27	**BTCE- 820 Bridge Engineering:**	**COUT 1** To evaluate the basic design considerations for different types of bridge structure. **COUT 2** To analyse the concrete and steel bridges as per the various loading standards of India. **COUT 3** To design the main structure of the concrete and steel bridges. **COUT 4** To design the various types sub-structure and bearings for a bridge. **COUT 5** To demonstrate the various construction and maintenance methods for a bridge structure.
29	**BTCE-805Major Project**	**COUT 1** Students will have the Knowledge and broad understanding of basic hardware components of the electronic and communication system. **COUT 2** Students can integrate the theory of their all Subjects for making the projects.

		COUT 3 Students can apply the knowledge to formulate the problems related with electronic and communication fields and concepts on the project. **COUT 4** Students can develop and design new projects by implementing the knowledge from the advance and recent technology.

Course Outcomes of CE Department (2018 Onwards)

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

		sewage under different situation. **COUT 5** Calculate drag force exerted by fluid on the body of varying shapes and able to minimize them. **COUT 6** Design and addressing problems in open channel (lined/ unlined) of different shapes and size optimally as per site condition.
	BTAM-301- 18 Mathematics-III (Transform & Discrete Mathematics)	**COUT 1** Understand the basic results on vector function, their properties and fields so as to apply them for solving problems of engineering. **COUT 2** Find length, area and volume using integral calculus that is an important application in engineering. **COUT 3** Solve some real problems in engineering using Gauss Divergence and Stokes' theorem **COUT 4** To formulate Laplace transform of functions and its applications to solve differential equations that form real life problems in engineering. **COUT 5** To formulate Fourier Series, its properties and its applications to solve problems in engineering.
	BTEC- 305- 18 Basic Electronics & applications in Civil Engineering	**COUT 1** Understand construction of diodes and their rectifier applications. **COUT 2** Appreciate the construction and working bipolar junction transistors and MOSFETs. **COUT 3** Design Op-Amp IC based fundamental applications. **COUT 4** Comprehend working of basic elements of digital electronics and circuits.
4	**HSMC-132- 18 Civil Engineering- Introduction, Societal & Global Impact**	**COUT 1** Introduction to what constitutes Civil Engineering **COUT 2** Understanding the vast interfaces this field has with the society at large **COUT 3** Providing inspiration for doing creative and innovative work for the benefit of the society **COUT 4** Need to think innovatively to ensure Sustainability **COUT 5** Highlighting the depth of engagement possible within civil engineering and exploration of various

		possibilities of a career in this field .
	BTCE-306-18 Surveying & Geomatics Lab	**COUT 1** Assess horizontal & vertical angles by Theodolite. **COUT 2** Survey the area using different methods of plane tabling and compass survey and to adjust the compass traverse graphically. **COUT 3** Compute the reduce levels using various methods of leveling. **COUT 4** Predict the location of any point horizontally and vertically using Tachometry. **COUT 5** Setting out curves in the field. **COUT 6** Use electronic survey instruments. curve for steel in torsion.
5	**BTCE-307- 18 Fluid Mechanics Lab**	**COUT 1** Select appropriate pressure measuring device under different condition offlow. **COUT 2** Determine the stability of a floating body. **COUT 3** Understand and apply Bernoulli's theorem practically. **COUT 4** Find discharge of fluid through pipe, orifices and in open channel. **COUT 5** Estimate the major and minor losses in pipe. **COUT 6** Estimate the various elements and energy losses in hydraulic jump.
6	**BTCE-308- 18 Solid Mechanics Lab**	**COUT 1** Understand the importance of physical properties of steel. **COUT 2** Identify and comprehend code provisions for testing different properties of steel. **COUT 3** Develop stress-strain curve for axial compression, axial tension and shear. **COUT 4** Assess hardness and impact strength of steel. **COUT 5** Assess flexural strength of a given material. **COUT 6** Evaluate fatigue and impact strength of steel.
7	**BMPD- 301-18 Mentoring and professional development**	**COUT 1** Overall Personality **COUT 2** Aptitude (Technical and General) **COUT 3** General Awareness (Current Affairs and GK) **COUT 4** Communication Skills **COUT 5** Presentation Skills

	BTCE- 332-18Training - I	**COUT 1** Visualize things/ concepts and express the thoughts in the form of sketches, models, etc **COUT 2** Create a well organized document using computers **COUT 3**Work in teams **COUT 4** Acknowledge the work of other in a consistent manner **COUT 5** Understanding of ethical and professional issues **COUT 6** Demonstrate effective oral communication and presentation skills
8	**BTCE-401- 18 Concrete Technology**	**COUT 1** Understand the relevance of different properties of constituent materials on properties of concrete. **COUT 2** Understand the behavior and durability aspects of concrete under different loading and exposure conditions. **COUT 3** Understand the issues involved in production and use of concrete. **COUT 4** Design of concrete mixes as per BIS specifications. **COUT 5** Understand various testing methods for concrete and their applicability. **COUT 6** Knowledge of special type of non-conventional concretes.
	BTCE-402- 18 Materials, Testing & Evaluation	**COUT 1** Appraisal about the role of materials in civil engineering **COUT 2** Introduce common measurement instruments, equipments and devices to capture the material response under loading **COUT 3** Exposure to a variety of established material testing procedures/techniques and the relevant codes of practice **COUT 4** Ability to write a technical laboratory report.

9	**BTCE-403- 18Hydrology & Water Resources Engineering**	**COUT 1** Understand the interaction among various processes in the hydrologic cycle. **COUT 2** Calculate the average annual rainfall of any area using the rain gauge data and inter-relations of various parameters as infiltration, evapotranspiration etc **COUT 3** Understand the various component of hydro graphs and able to estimate the run off. **COUT 4** Find the water requirement for different crops and able to proposed appropriate method of applying water. **COUT 5** Understand the distribution system of canal and various components of irrigation system. **COUT 6** Classify dams and spillways, their problems and able to determine forces exerted by fluid on dams.
10	**BTCE-404- 18Transportation Engineering**	**COUT 1** Appreciate the importance of different modes of transportation and characterize the road transportation. **COUT 2** Alignment and geometry of pavement as per Indian Standards according to topography. **COUT 3** Assess the properties of highway materials in laboratory **COUT 4** Understand the importance of railway infrastructure planning and design. **COUT 5** Identify the functions of different component of railway track. **COUT 6** Outline the importance of Airport Infrastructure
	BTCE-405- 18 Disaster Preparedness & Planning	**COUT 1** Identify various types of disasters, their causes, effects & mitigation measures. **COUT 2** Demonstrate the understanding of various phases of disaster management cycle and create vulnerability and risk maps. **COUT 3** Understand the use of emergency management system to tackle the problems. **COUT 4** Discuss the role of media, various agencies and organisations for effective disaster management. **COUT 5** Design early warning system and understand the utilization of advanced technologies in disaster management. **COUT 6** Compare different models for disaster management and plan & design of infrastructure for effective disaster management.

11	**EVS-101-18Environmental Science**	**COUT 1** Students will enable to understand environmental problems at local and national level through literature and general awareness. **COUT 2** The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who have done practical work on various environmental Issues. **COUT 3** The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate these problems. **COUT 4** Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.
12	**BTCE-406- 18 Concrete Testing Lab**	**COUT 1** Evaluate properties of building materials, such as cement and aggregates. **COUT 2** Conduct experiments and check the acceptance criteria (if any). **COUT 3** Design concrete mixes as per BIS provisions. **COUT 4** Analyze the properties of concrete in fresh and hardened state. **COUT 5** Create a well organized document and present the results appropriately. **COUT 6** Understand and apply non destructive testing (NDT) for evaluating concrete quality.
13	**BTCE-407-18Transportation Lab**	**COUT 1** Characterize the pavement materials as per the Indian Standard guidelines. **COUT 2** Evaluate the strength of subgrade soil by CBR test. **COUT 3** Conduct experiments to evaluate aggregate properties. **COUT 4** Determine properties of bitumen material and mixes **COUT 5** Evaluate the pavement condition by rough meter and Benkelman beam test.

		COUT 6 Create a well organized report and present the results appropriately
14	**BTCE-432-18 Training-II**	**COUT 1** Survey camp of an area (2 weeks) **COUT 2** Hands-on-training of modern surveying equipment such as Digital Theodolite, Total Stations, Autolevel, and GPS. **COUT 3** On-site application of traversing, etc. for preparation of topographical maps of an area. **COUT 4** – 4 week Summer Internship in Industry/ Construction site/ Appropriate workplace
	BMPD-401-18 Mentoring and professional development	**COUT 1** Part – A (Class Activities)- Expert and video lectures ,Aptitude Test ,Group Discussion ,Quiz (General/Technical) , Presentations by the students ,Team building Exercises. **COUT 2** Part – B (Outdoor Activities) ,Sports/NSS/NCC ,Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, Cultural Club, etc.
15	**BTCE-501-18 Engineering Geology**	**COUT 1** The basic concepts of geological processes and their importance in civil Engineering **COUT 2** Identification of rocks and minerals and their characteristics **COUT 3** Significance of geological structures and processes in civil engineering projects **COUT 4** Site characterization and geologic considerations in construction.
	BTCE-502-18 Elements of Earthquake Engineering	**COUT 1** Appreciate the role of earthquake forces in structural design of building. **COUT 2** Apply various codal provisions related to seismic design of buildings. **COUT 3** Acquire new basic knowledge in earthquake engineering.

16	**BTCE-503-18 Construction Engineering & Management**	**COUT 1** An understanding of modern construction practices **COUT 2** A good idea of basic construction dynamics- various stakeholders, project objectives, **COUT 3** processes, resources required and project economics **COUT 4** A basic ability to plan, control and monitor construction projects with respect to time and cost **COUT 5** An idea of how to optimise construction projects based on costs **COUT 6** An idea how construction projects are administered with respect to contract structures and issues. **COUT 7** An ability to put forward ideas and understandings to others with effective communication processes
	BTCE-504-18 Environmental Engineering	**COUT 1**Understand the impact of humans on environment and environment on humans **COUT 2**Be able to identify and value the effect of the pollutants on the environment: atmosphere, water and soil. **COUT 3**Be able to plan strategies to control, reduce and monitor pollution. **COUT 4**Be able to select the most appropriate technique for the treatment of water, wastewater ,solid waste and contaminatedair. **COUT 5**Be conversant with basic environmental legislation.
17	**BTCE-505-18 Structural Engineering**	**COUT 1** The students will be able to apply their knowledge of structural mechanics in addressing design problems of structural engineering **COUT 2** They will possess the skills to analyse and design concrete and steel structures **COUT 3** They will have knowledge of structural engineering.
	BTCE-506-18 Geotechnical Engineering	**COUT 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. **COUT 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 **COUT 3** Apply the various specifications of compaction of soils in the construction of highways and earthen dams. **COUT 4** Able to apply the knowledge of consolidation, soil deformation parameters, and calculate settlement magnitude and rate of settlement. **COUT 5** Design the embankment slopes and check the stability of finite slopes.
18	**BTCE-507-18 Geotechnical Lab**	**COUT 1** Determination of in-situ density by core cutter method and Sand replacement method. **COUT 2** Determination of Liquid Limit & Plastic Limit. **COUT 3** Determination of specific gravity of soil solids by pyconometer method. **COUT 4** Grain size analysis of sand and determination of uniformity coefficient (Cu) and coefficient of curvature (Cc),Compaction test of soil. **COUT 5** Determination of Relative Density of soil. **COUT 6** Determination of permeability by Constant Head Method. **COUT 7** Determination of permeability by Variable Head method. **COUT 8** Unconfined Compression Test for fine grained soil,Direct Shear Test ,Triaxial Test ,Swell Pressure Test .
19	**BTCE-508-18 Environmental Engineering Lab**	**COUT 1** To measure the pH value of a water/waste water sample. **COUT 1** To determine optimum Alum dose for Coagulation. **COUT 1** To find MPN for the bacteriological examination of water. **COUT 1** To find the turbidity of a given waste water/water sample **COUT 1** To find B.O.D. of a given waste water sample. **COUT 1** To measure D.O. of a given sample of water.
	BTCE-509-18 Structural Lab	**COUT 1** Deflection of a simply supported beam and verification of Clark-Maxwell's theorem. **COUT 2** To determine the Flexural Rigidity of a given

		beam. **COUT 3** Deflection of a fixed beam and influence line for reactions. **COUT 4** Deflection studies for a overhang beam and influence line for reactions. **COUT 5** Structural Drawings of Reinforced Concrete Elements such as Beams, Slabs. **COUT 6** Structural Drawings of Steel Elements such as Connections, Tension Members, Compression Members, Beams.
20	**BMPD-501-18 Mentoring and professional development**	**COUT 1** Part – A (Class Activities)- Expert and video lectures ,Aptitude Test ,Group Discussion ,Quiz (General/Technical) , Presentations by the students ,Team building Exercises. **COUT 2** Part – B (Outdoor Activities) ,Sports/NSS/NCC ,Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, Cultural Club, etc.
21	**BTCE-601-18 Engineering Economics, Estimation &Costing**	**COUT 1**Have an idea of basic principles and elements of economics in general. **COUT 2**Be able to carry out and evaluate benefit/cost, life cycle and breakeven analyses on one or more economic alternatives. **COUT 3**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. **COUT 4**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. **COUT 5**Be able to understand how competitive bidding works and how to submit a competitive bid proposal.
22	**PECE-602A-18 Foundation Engineering**	**COUT 1** Understand the methods of surface and subsoil exploration and to prepare investigation report. **COUT 2** Estimate the stresses in soils and bearing capacity of soil for shallow foundation. **COUT 3** Design various types of shallow foundation and to estimate settlement. 4 **COUT 4** Apply the concepts of deep foundation and solve problems related with pile foundation.

23	**PECE-603F-18 Bridge Engineering**	**COUT 1** To evaluate the basic design considerations for different types of bridge structure. **COUT 2** To analyse the concrete and steel bridges as per the various loading standards of India. **COUT 3** To design the main structure of the concrete and steel bridges. **COUT 4** To design the various types sub-structure and bearings for a bridge. **COUT 5** To demonstrate the various construction and maintenance methods for a bridge structure.
24	**PECE-604E-18 Contract Management**	**COUT 1** To make Civil Engineering students able to analyze. **COUT 2** Evaluate and design construction contract documents.
25	**BTCS402-18-Operationg Systerm**	**COUT 1** Explain basic operating system concepts such as overall architecture, system calls, user mode and kernel mode. **COUT 2** Distinguish concepts related to processes, threads, process scheduling, race conditions and critical sections. **COUT 3** Analyze and apply CPU scheduling algorithms, deadlock detection and prevention algorithms. **COUT 4** Examine and categorize various memory management techniques like caching, paging, segmentation, virtual memory, and thrashing. **COUT 5** Design and implement file management system; **COUT 6** Appraise high-level operating systems concepts such as file systems, disk-scheduling algorithms and various file systems.
	BTEC-601-18 -Wireless Communications	**COUT 1** Understand the basic elements of Cellular Radio Systems and its design **COUT 2** Learn about the concepts Digital communication through fading multipath channels **COUT 3** Understand various Multiple Access techniques for Wireless communication **COUT 4** Know about the Wireless standards and systems .
26	**BTMC-101-18 Constitution of India**	**COUT 1** To understand the structure of executive, legislature and judiciary **COUT 2** To understand philosophy of fundamental rights and duties

		COUT 3 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. **COUT 4** To understand the central and state relation, financial and administrative.
	BMPD-601-18 Mentoring and Professional Development	**COUT 1** Part – A (Class Activities)- Expert and video lectures ,Aptitude Test ,Group Discussion ,Quiz (General/Technical) , Presentations by the students ,Team building Exercises. **COUT 2** Part – B (Outdoor Activities) ,Sports/NSS/NCC ,Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, Cultural Club, etc.
	BTCE-801-18 SOFTWARE AND INDUSTRIAL TRAINING	**COUT 1** Students will be able to define compelling and viable problems . **COUT 2** Students will be able to develop skills to create practical solutions to identified problem. **COUT 3** Students will be able to interpret the software lifecycle model and other artifacts appropriate for problem. **COUT 4** Students will be able to identify and master tools required for the project. **COUT 5** Students will be able to plan and work systematically towards completion of a project works. **COUT 6** Students will be able to develop the ability to explain and defend their work in front of an evaluation panel.
27	**PECE -701D-18- Highway Construction and Management**	**COUT 1** Understand various materials and techniques used to construct pavements. **COUT 2** Design the bituminous pavement as per standards. **COUT 3** Design thickness and joints including drainage of concrete pavements. **COUT 4** Suggest maintenance of pavement. **COUT 5** Conceptualize pavement management systems.
29	**PECE-702B-18 -Rural water Supply And onsite Sanitation Systems**	**COUT 1** 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.

		COUT 2 The student will be able to apply the knowledge gained from the subject in EIA studies for water component and water pollution control strategies.
30	**OECE-701-18-Open Elective – III(Metro system and Engg)**	**COUT 1** Introduction toMetro systems Overview of Metro Systems; Need for Metros; Routing studies; Basic Planning and Financials. **COUT 2** Planning and Development Overview and construction methods for: Elevated and underground Stations; Viaductpansandbridges;Undergroundtunnels;Depots;CommercialandServicebuildings.
	PECE-703C-18-Ground Water	**COUT 1** use information from wells, the topography of the ground and a water table contour map, to carry out the following: interpret cross-sections, **COUT 2** calculate the thickness of the unsaturated zone, **COUT 3** 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
	project	**COUT 1** To make them understand the concepts of Project Management for planning to execution of projects. **COUT 2** To make them understand the feasibility analysis in Project Management and network analysis tools for cost and time estimation. **COUT 3** To enable them to comprehend the fundamentals of Contract Administration, Costing and Budgeting. **COUT 4** Make them capable to analyze, apply and appreciate contemporary project management tools and methodologies in Indian context.
	HSMC-255 Professional Practice, Law &Ethics	**COUT 1** To make the students understand the types of roles they are expected to play in the **COUT 2** society as practitioners of the civil engineering profession

		COUT 3 To develop some ideas of the legal and practical aspects of their profession.
	BTMC-701-18 Management- I (Organizational Behaviour)	**COUT 1** Individuals – Behaviour in an individual context **COUT 2** Groups/teams – Behaviour in a n organizational context **COUT 3** 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 (2015 Onwards)

Serial No.	*Course Code and Name*	*Course Outcomes*
1.	**MCA 101 Information Management**	COUT1: Students should be able to describe various I/O Devices. COUT2: Students should be able to describe IT Infrastructure. COUT3: Students should be able to apply Management Information System. COUT4: Students should be able to apply Various automation tools like Word, Excel etc.
2.	**MCA 102 Object Oriented Programming in C++**	COUT1: To learn programming from real world examples. COUT2: To understand Object oriented approach for finding Solutions to various problems with the help of C++ language. COUT3: To create computer based solutions to various real-world problems using C++ COUT4: To learn various concepts of object oriented approach towards problem solving COUT5: To learn programming from real world examples. COUT6: To understand Object oriented approach for finding
3.	**MCA 103 Computer Organization and Assembly Language**	COUT1: Students will apply the knowledge of the computer registers and instructions for designing a basic computer system. COUT2: Students will have a comprehend idea about the register transfer languages and operations for designing of a complete basic computer and its working. COUT3: Student will be able to apply the knowledge of input-output organization and different modes of data transfer. COUT4: Student will have an ability to analyze the design of a pipelined CPU and the concept of Parallel processing. COUT5: Students will learn about the designing of different types of control units. COUT6: A knowledge base to design and develop applications using assembly language. COUT7: The ability to combine assembly and high-level language modules.
4.	**MCA 104**	COUT1:Students will be able to understand basic fundamentals of accounting. COUT2: Students will be able to understand to understand basic operations of business transactions

	Accounting & Financial Management	COUT3: Students will be able to understand basic banking operations. COUT4: Students will be able to understand final accounts and importance of accounting in business.
5.	**MCA105 Technical Communication**	COUT1: Students should be able to speak in English, in real life situation. COUT2: Students should inculcate reading habits and gain effective reading skills. COUT3: Students should learn more on active and passive vocabulary. COUT4: Students should develop listening skills for academic and professional purpose. COUT5: Students should be able to comprehend scientific and technical English. COUT6: Students should develop writing skills to prepare CVs, letters and reports in formal and business situations. COUT7: Students should be able to analyze and interpret engineering problems expressed in English.
6.	**MCA 106 Software Lab- I (Information Management)**	COUT1: Design data-intensive applications using cutting edge technologies tailored to the specific needs of any business scenario. COUT2: Implement the core aspects of information technology in a business. COUT3: Understand the strategic and operational benefits of business models and technology applications. COUT4: 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++)**	COUT1: Students should be able to construct programs using classes and objects. COUT2Students should be able to create programs using constructors, destructors and initializer list. COUT3: Students should be able to develop operator overloading and type casting programs. COUT 4: Students should be able to demonstrate inheritance, polymorphism. COUT 5:Students should be able to design Templates and manipulation of files

		COUT 6: Students should be able to formulate file handling.
8.	**MCA 201 Mathematical Foundations of Computer Science**	COUT1: Knowledge of Sets, Relations and their properties with functions including Hashing functions. COUT2: Gain Knowledge to reason mathematically about basic data types and structures (such as numbers, sets, graphs, and trees) used in computer algorithms and systems. COUT3: Knowledge of model and analyze computational processes using analytic and combinatorial methods. COUT4: Gain knowledge to apply principles of discrete probability to calculate probabilities and expectations of simple random processes. COUT5: Knowledge of Matrix Algebra.
9.	**MCA 202 Relational Database Management System**	COUT1: Students will be able to understand the structure of DBMS and how it is organized level by level. COUT2: Students will be able to do SQL queries thoroughly to store and retrieve data. COUT3: Students will be able to do PL/ SQL programs, cursors, triggers thoroughly. COUT4: Students will be able to do normalization to handle different types of anomalies. COUT5: Students will be able to handle different RDBMS.
10.	**MCA 203 Data Structures**	COUT1: Describe the usage of various data structures. COUT2: Student will be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures. COUT3: Student will be able to choose appropriate data structure as applied to specified problem definition. COUT4: Recognize the associated algorithms operations and complexity. COUT5: Develop computer programs to implement different data structures and related algorithms.
11.	**MCA 204 Data Communication and Networks**	COUT1: Describe the usage of various data structures. COUT2: Student will be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures. COUT3: Student will be able to choose appropriate data structure as applied to specified problem definition. COUT4: Recognize the associated algorithms operations and complexity.

		COUT5: Develop computer programs to implement different data structures and related algorithms.
12.	**MCA 205 Linux Operating System**	COUT1: Students should be able to Gain Knowledge about the basic operating system. COUT2: Students should be able to Understand the Linux Operating system. COUT3: Students should be able to understand the management of users. COUT4: Students should be able to learn different commands in LINUX. COUT5: Students should be able to Boot the system. COUT6: Students should be able to manage files, core system services and Printing.
13.	**MCA 206 Software Lab –III (Relational Database Management System)**	COUT1:Understand the basic concepts of DBMS. COUT2:Formulate, using SQL, solutions to a broad range of query and data update problems. COUT3:Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database COUT4:Understand the concept of Transaction and Query processing in DBMS.
14.	**MCA 207 Software Lab –IV (Data Structures)**	COUT1:Apply appropriate constructs of Programming language, coding standards for application development COUT2:Develop programming skills for solving problems. COUT3:Apply appropriate searching and/or sorting techniques for application development.
15.	**MCA 208 Software Lab –V (Based on Linux operating system)**	COUT1:Explain the fundamental concepts of open-source operating system Linux COUT2: Understand the basic set of commands and editors in Linux operating system. COUT3:Discuss shell programming in Linux operating system COUT4:Demonstrate the role and responsibilities of a Linux system administrator COUT5:Distinguish various filter and server commands
16.	**MCA 301**	COUT1: Students should be able to define database administrator's roles and responsibilities and also able to install and upgrade database packages.

	Database Administration	COUT2: Students should be able to implement business polices, database compression and also import and export the database. COUT3: Students should be able to apply security methods against threats and restore or recover the database. COUT4: Students should be able to learn the monitoring and optimizing performance of the database.
17.	**MCA 302 Information Security**	COUT1: Students should be able to have complete understanding of the security issues surrounding networks. COUT2:Students should be able to have detailed and critical understanding of the concepts, issues, principles and theories of computer network security COUT3:Students should be able to have detailed and practical understanding of formalisms for specifying security related properties and validating them using model checking COUT5: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 COUT6: Students should be able to understand and apply the concepts for administrating a small company's network. COUT7: 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**	COUT1:Students should be able to understand the basics of S/W engineering. COUT2: Students should be able to classify the various models. COUT3: Students should be able to apply the concept of project management. COUT4: Students should be able to analyze the software using various testing methods. COUT5: Students should be able to do quality control.
19.	**MCA 304 Java Programming**	COUT1:Students will be able to write, compile & execute basic java program COUT2: The student will be able to learn the use of data types & variables, decision control structures: if, nested if etc. COUT3: 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. COUT4: The student will be able create and use threads, handle exceptions and write applets.

		COUT5: 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**	COUT1:Students should be able to describe various system programs. COUT2: Students should be able to assimilate as to how system programs like assemblers & compilers translate source codes. COUT3:Students should be able to discuss data structures and algorithms behind system programs like assemblers & compilers. COUT4: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. COUT5:Students should be able to understand the design of various system software's like linker and loaders. COUT6:Students should be able to discuss various system programs like editors & debuggers
21.	**MCA 306 Software Lab-VI [Database Administration]**	COUT1: Understand, analyze and apply common SQL statements including DDL, DML and DCL statements to perform different operations. COUT2: Design different views of tables for different users and to apply embedded and nested queries. COUT3:Design and implement a database for a given problem according to well-known design principles that balance data retrieval performance with data consistency. COUT4:Demonstrate and understand relational algebra in Database which is helpful to design related database software components. COUT5:Identify the user requirements from a typical business situation, and to document them.
22.	**MCA 307 Software Lab-VII [Java Programming]**	COUT1: Implement Core Java concepts. COUT2: Solve computational problems using various operators of Java. COUT3: Design solutions to complex by handling exceptions that may occur in the programs. COUT4: Solve complex and large problems using the concept of multithreading. COUT5: Implement interfaces and design packages. Implement Core Java concepts.
23.	**MCA 401**	CO1: Students will be able to do work on Android OS.

	Mobile Application 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**	COUT1:Understand various applications and scope of ecommerce. COUT2:Acquire knowledge of various payment modes used in ecommerce today. COUT3:Learn to develop, evaluate, and execute a comprehensive digital marketing strategy and plan COUT4:Understand the major digital marketing channels - online advertising: Digital display, video, mobile, search engine, and social media COUT5:Describe how and why to use digital marketing for multiple goals within a larger marketing and/or media strategy, COUT6:Developing effective digital and social media Strategies
25.	**MCA 403 Interactive Computer Graphics**	COUT1:Students will develop programs for lines and circle drawing. COUT2:Students will program the hidden surface elimination technique and demonstrate the rotation of the 3d object. COUT3:Students will write program functions to implement the different transformations that includes rotation, translation, scaling of 2d objects. COUT4:Students will be able to construct curves and irregular patterns. COUT5:Students will write programs that demonstrate computer graphics animations.
26.	**MCA 404 Advanced Operating Systems**	COUT1:Discuss the evaluation of operating systems. COUT2: Explain different resource managements performed by operating system. COUT3 Describe the architecture in terms of functions performed by different types of operating systems. COUT4: Analyze the performance of different algorithms used in design of operating system

27.	**MCA 405 Software Lab- VIII (E-Commerce & Web Application Development)**	COUT1:Understand of implementation of ecommerce applications. COUT2: Learn to develop and implement digital marketing strategy and plan COUT3: Implement and developing effective digital and social media strategies COUT4: 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)**	COUT1:Understand the structure of modern computer graphics. COUT2:Develop and design drawings that demonstrate computer graphics and design skills. COUT3:Make use of the key algorithms for modeling and rendering graphical data. COUT4:Develop, design and problem solving skills with application to computer graphics. COUT5:Creating programs in C++ to implement various graphical features like clipping, filling etc.
29.	**MCA 501 Artificial Intelligence**	COUT1: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**	COUT1: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

		COUT2: The student should be able to analyze a web page and identify its elements and attributes. COUT3: The student should be able to create XML documents and XML Schema. COUT4: The student should be able to create dynamic web pages using JavaScript and VBScript (client side programming). COUT5: The student should be able to build and consume web services.
32.	**MCA 504 Object Oriented Analysis & Design with UML**	COUT1:Students should be able to know about object oriented systems and its concepts- classes, objects, abstraction, inheritance etc COUT2:Students should learn about Iterative and incremental development approach of software development, the unified process and its phases COUT3: Students should be able to know about UML and various concepts and diagrams of UML in detail. COUT4:Students should be able to know about various design patterns- GoF and GRASP, their types and also about Antipatterns COUT5: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 COUT6: Students should be able to know about aspect oriented and service oriented approach of software development.
33.	**MCA 506 Software Lab –XI (Web Technologies**	COUT1: Students should be able to design dynamic and creative webpages using XHTML. COUT2: Students should be able to design webpages using technologies like JavaScript, CSS, HTML, and AJAX. COUT3: Students should have clear understanding of hierarchy of objects in HTML and XML. COUT4: Students should have knowledge about internet related technologies and Web Services.
34.	**MCA 507 Software Lab –XII (Object Oriented analysis and design with UML)**	COUT1: Students should be able to understand the various concepts of OOAD like inheritance, polymorphism, association etc. COUT2: Students should be able to understand class modeling and draw class diagrams. COUT3: Students should be able to draw use case diagrams. COUT4: Students should be able to identify various business activities and develop the activity diagram.

		COUT5: Students should be able to understand state modeling and draw state diagrams. COUT6: Students should be able to draw component diagram and deployment diagram.
35.	**MCA 507 Industrial Training**	COUT1: Students will be able to gain environment experience and at the same time, to gain the knowledge through hands on observation and job execution. COUT2: Students will also develop skills in work ethics, communication, management and others.
36.	**MCA601 Data Warehousing & Mining**	COUT1:Students should be able to describe basic concepts of data warehousing. COUT2:Students should be able to describe basic concepts of spatial data warehouse. COUT3:Students should be able to describe basic concepts of temporal data warehouse. COUT4:Students should be able to describe various data mining functionalities. COUT5:Students should be able to discuss algorithms or techniques for various data mining functionalities.
37.	**MCA602 Cloud Computing**	COUT1: Students will be able to do work on Android OS. COUT2: Students will be able to create different type of Android based applications. COUT3: Students will be able to discuss various security issues in Android platform. COUT4: Students will be able to implement various database applications and content providers. COUT5: Students will be able to differentiate among various types of operating systems.
38.	**MCA603 Advanced Computer Architecture**	COUT1: 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. COUT2: Learn number system and various types of micro-operations of processor. COUT3: Learn the communication of various components through common bus. COUT4: Learn how to design Combinational & Sequential circuits
39.	**MCA604 Software Testing &**	COUT1: Aware about the engineering approach to analysis, design and built the software COUT2: Understand the phases and activities involved in the conventional software life cycle models

	Quality Management	COUT3: Analyze problems, and identify and define the computing requirements appropriate to its solution. COUT4: Apply design and development principles in the construction of software systems of varying complexity COUT5: Apply current techniques, skills, and tools necessary for computing practice.
40.	**MCA605 Software Lab XIII (Software Testing)**	COUT1: Elicit, analyze and specify software requirements. COUT2: Analyze and translate a specification into a design COUT3: Realize design practically, using an appropriate software engineering methodology. COUT4: Plan a software engineering process life cycle. COUT5: Use modern engineering tools for specification, design, implementation, and testing
41.	**MCA606 Project**	COUT1: Students will develop plans with relevant people to achieve the project's goals. Break work down into tasks and determine handover procedures. COUT2: estimate and cost the human and physical resources required, and make plans to obtain the necessary resources COUT3: 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)

S No.	*Course Code and Name*	*Course Outcomes*
1.	**BSBC 101 Communication-I**	COUT1: Students should be able to speak in English, in real life situation. COUT2: Students should inculcate reading habits and gain effective reading skills. COUT3: Students should learn more on active and passive vocabulary. COUT4: Students should develop listening skills for academic and professional purpose. COUT5: Students should be able to comprehend scientific and technical English. COUT6: Students should develop writing skills to prepare CVs, letters and reports in formal and business situations. COUT7: 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++**	COUT1: To learn programming from real world examples. COUT2: To understand Object oriented approach for finding Solutions to various problems with the help of C++ language. COUT3: To create computer based solutions to various real-world problems using C++ COUT4: To learn various concepts of object oriented approach towards problem solving COUT5: To learn programming from real world examples. COUT6: 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++)**	COUT1: Students should be able to construct programs using classes and objects. COUT2 Students should be able to create programs using constructors, destructors and initializer list. COUT3: Students should be able to develop operator overloading and type casting programs. COUT 4: Students should be able to demonstrate inheritance, polymorphism. COUT 5:Students should be able to design Templates and manipulation of files COUT 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**	COUT1: Describe the usage of various data structures. COUT2: Student will be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures. COUT3: Student will be able to choose appropriate data structure as applied to specified problem definition. COUT4: Recognize the associated algorithms operations and complexity. COUT5: 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**	COUT1:Students will be able to understand basic fundamentals of accounting. COUT2: Students will be able to understand to understand basic operations of business transactions COUT3: Students will be able to understand basic banking operations. COUT4: Students will be able to understand final accounts and importance of accounting in business.
19.	**BSBC305 Software Lab-IV (Data Structures)**	COUT1:Apply appropriate constructs of Programming language, coding standards for application development COUT2:Develop programming skills for solving problems. COUT3:Apply appropriate searching and/or sorting techniques for application development.
20.	**BSBC306 Hardware Lab-I(Digital Circuits &Logic Design)**	CO1: The students will be able to perform number system conversions. 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**	COUT1: Students will be able to understand the structure of DBMS and how it is organized level by level. COUT2: Students will be able to do SQL queries thoroughly to store and retrieve data. COUT3: Students will be able to do PL/ SQL programs, cursors, triggers thoroughly. COUT4: Students will be able to do normalization to handle different types of anomalies. COUT5: Students will be able to handle different DBMS.
25.	**BSBC405 Hardware Lab-II(Microprocessors & Microcontrollers)**	COUT1: Students will be able to know about Introduction to assembly language and its fundamentals. COUT2: Students will be able to know about programming Data transfer Instructions. COUT3: Students will be able to know programming Arithmetic Instructions, Logical Instructions, shift rotate Instruction & transfer control instructions. COUT4: Students will be able to complete the experiments in laboratory and present the technical report.

		COUT5: Students will be able to describe the architecture of microprocessor and its peripheral devices.
26.	**BSBC501 Data Warehousing & Mining**	COUT1: Students should be able to describe basic concepts of data warehousing. COUT2: Students should be able to describe basic concepts of spatial data warehouse. COUT3: Students should be able to describe basic concepts of temporal data warehouse. COUT4: Students should be able to describe various data mining functionalities. COUT5: Students should be able to discuss algorithms or techniques for various data mining functionalities.
27.	**BSBC502 Programming in Java**	COUT1: Students will be able to write, compile & execute basic java program COUT2: The student will be able to learn the use of data types & variables, decision control structures: if, nested if etc. COUT3: 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. COUT4: The student will be able create and use threads, handle exceptions and write applets. COUT5: The student will be able to learn the use oops concept i.e. data abstraction & data hiding, encapsulation, inheritance, polymorphism.
28.	**BSBC503 Management Information System**	COUT1:The student will be able to solve the problems related to the analysis, design & construction of MIS. COUT2: The student will be able to demonstrate the knowledge & ability to define the concept & definition of Information systems. COUT3: The student will be able to describe the system development stages. Cout4: The student will be able to describe the organizational structure & business processes within these structures. COUT5: Describe the system design & implementation.
29.	**BSBC 504 Workshop on Advanced Web Development**	COUT1: Getting started with Active Server pages, setting up internet Information server, using ASP without IIS. COUT2: Dissecting you first ASP script, writing ASP code without using comments. COUT3: Working with variables, constants, arrays, VB script operators & Understanding VB script control

		structures, Typecasting variables. COUT4: Working with Objects, Events & Communicating with user, creating, designing & submitting forms. COUT5: Working with request objects, how to write cookies ,Debugging ASP scripts, Reading database Using ASP. COUT6: Examining the records.
30.	**BSBC505 Software Lab-VI(Programming in Java)**	COUT1: The student should be able to implement Core Java concepts. COUT2: The student should be able to solve computational problems using various operators of Java. COUT3: The student should be able to design solutions to complex by handling exceptions that may occur in the programs. COUT4: The student should be able to solve complex and large problems using the concept of multithreading. COUT5: The student should be able to implement interfaces and design packages. Implement Core Java concepts.
31.	**BSBC506 Project Work-I**	COUT1: The student should be able to know about various visual basic tools. COUT2: The student should be able to know about commands of VB&SQL COUT3: The student should be able to know about software development process. COUT4: The student should be able to know about able to exhibit both analytical and synthetically skills. COUT5: 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**	COUT1: Students should be able to evaluate approaches to addressing issues of diversity. COUT2: Integrate management principles into management practices. COUT3: Specify how the managerial tasks of planning, organizing, and controlling can be executed in a variety of circumstances. COUT4: Assess managerial practices and choices relative Ethical principles and standards.

		COUT5: Determine the most effective action to take in specific situations.
33.	**BSBC602 Computer Graphics**	COUT1: Students will develop programs for lines and circle drawing. COUT2: Students will program the hidden surface elimination technique and demonstrate the rotation of the 3d object. COUT3: Students will write program functions to implement the different transformations that includes rotation, translation, scaling of 2d objects. COUT4: Students will be able to construct curves and irregular patterns. COUT5: Students will write programs that demonstrate computer graphics animations.
34.	**BSBC603 Computer Networks**	COUT1: Students should be able to understand network models. Students should be able to Understand different network technologies. COUT2: Students should be able to Understand the effects of using different networking topologies. COUT3: Students should be updated with different advanced network technologies that can be used to connect different networks. COUT4: 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**	COUT1: Students should be able to have complete understanding of the security issues surrounding networks. COUT2:Students should be able to have detailed and critical understanding of the concepts, issues, principles and theories of computer network security COUT3:Students should be able to have detailed and practical understanding of formalisms for specifying security related properties and validating them using model checking COUT5: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 COUT6: Students should be able to understand and apply the concepts for administrating a small company's network.

		COUT7: 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)**	COUT1:Understand the structure of modern computer graphics. COUT2:Develop and design drawings that demonstrate computer graphics and design skills. COUT3:Make use of the key algorithms for modeling and rendering graphical data. COUT4:Develop, design and problem solving skills with application to computer graphics. COUT5: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. COUT2: Students will be able to exhibit both analytical and synthetically skills. COUT3: A Students will be able to know the complete project life cycle and the project time estimation & its management. COUT4: Students will be able to gain knowledge of various simulation tools. COUT5: Students will be able to adapt to culture working in a team.

Course Outcomes of Bachelor of Computer Applications (2019 Onwards)

Serial No.	***Course Code and Name***	***Course Outcomes***
1.	**UGCA1901 Mathematics**	COUT1: Represent data using various mathematical notions. COUT2: Explain different terms used in basic mathematics. COUT3: Describe various operations and formulas used to solve mathematical problems
2.	**UGCA1902 Fundamentals of Computer and IT**	COUT1: Understanding the concept of input and output devices of Computers COUT2: Learn the functional units and classify types of computers, how they process information and how individual

		computers interact with other computing systems and devices. COUT3: Understand an operating system and its working, and solve common problems related to operating systems COUT4: Learn basic word processing, Spreadsheet and Presentation Graphics Software skills. COUT5: Study to use the Internet safely, legally, and responsibly
3.	**UGCA1903 Problem Solving using C**	COUT1: Student should be able to understand the logic building used in Programming. COUT2: Students should be able to write algorithms for solving various real life problems. COUT3: To convert algorithms into programs using C .
4.	**UGCA1904 Workshop on Desktop Publishing**	COUT1: The students will gain professional skills of Desk Top Publishing Tools like designing, Printing & Publishing by using various tools. COUT2: Develop skills in printing jobs through basic understanding of a variety of designing tools. COUT3: Apply these concepts and knowledge in designing field including practice from text formatting to final publishing. COUT4: Workshops are included to enhance professional skills like Brochures, Flexes, Business Cards, Certificates and News Letter layouts etc.
5.	**UGCA1905 Problem Solving using C Laboratory**	COUT1: Students should be able understand the logic building used in programming COUT2: Students should be able to write algorithms for solving various real-life problems COUT3: Students should be able to convert the algorithms into computer programs using C language.
6.	**UGCA1906 Fundamentals of Computer and IT Laboratory**	COUT1: Familiarizing with Open Office (Word processing, Spreadsheets and Presentation). COUT2: To acquire knowledge on editor, spread sheet and presentation software. COUT3: The students will be able to perform documentation and accounting operations. COUT4: Students can learn how to perform presentation skills.
7.	**BTHU103-18 English**	COUT1: The objective of this course is to introduce students to the theory, fundamentals and tools of communication.

		COUT2: To help the students become the independent users of English language. COUT3: To develop in them vital communication skills which are integral to their personal, social and professional interactions. COUT4: The syllabus shall address the issues relating to the Language of communication. COUT5: 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.
8.	**BTHU104/18 English Practical/Laboratory**	COUT1: The objective of this course is to introduce students to the theory, fundamentals and tools of communication. COUT2: To help the students become the independent users of English language. COUT3: To develop in them vital communication skills which are integral to personal, social and professional interactions. COUT4: The syllabus shall address the issues relating to the Language of communication. COUT5: 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.
9.	**HVPE101-18 Human Values, De-addiction and Traffic Rules**	COUT1: 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 COUT2: 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 COUT3: 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.

10.	**HVPE102-18 Human Values, De-addiction and Traffic Rules (Lab/ Seminar)**	COUT1: 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.
11.	**BMPD102-18 Mentoring and Professional Development**	COUT1: Build and support effective relationships COUT2: Create a mentor personality profile. COUT3: Effective skills identification and analysis. COUT4: Mentoring and coaching as elements of professional growth.
12.	**UGCA1907 Fundamentals of Statistics**	COUT1: Understand the science of studying & analyzing numbers. COUT2: Identify and use various visualization tools for representing data. COUT3: Describe various statistical formulas. COUT4: Compute various statistical measures.
13.	**UGCA1908 Computer System Architecture**	COUT1: 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. COUT2: Learn number system and various types of micro-operations of processor COUT3: .Learn the communication of various components through common bus. COUT4: Learn how to design Combinational & Sequential circuits
14.	**UGCA1909 Object Oriented Programming using C++**	COUT1: To learn programming from real world examples. COUT2: To understand Object oriented approach for finding Solutions to various problems with the help of C++ language. COUT3: To create computer based solutions to various real-world problems using C++ COUT4: To learn various concepts of object oriented approach towards problem solving
15.	**UGCA1910**	COUT1: To learn programming from real world examples. COUT2: To understand Object oriented approach for finding Solutions to various problems with the help of C++ language.

	Object Oriented Programming using C++ Laboratory	COUT3: To create computer based solutions to various real-world problems using C++ COUT4: To learn various concepts of object oriented approach towards problem solving
16.	**UGCA1911 Fundamentals of Statistics Laboratory**	COUT1: Represent data using various Frequency table and Graphs. COUT2: Apply various operations/ formulas using any software/package to solve statistical problems.
17.	**UGCA1912 Computer System Architecture Laboratory**	COUT1: The students will be able to perform number system conversions. COUT2: The students will understand the function of all components of Computer architecture. COUT3: The students will understand various types of basic, combinational & universal logic gates COUT4: The students will learn how to design Combinational circuits like Adder, Subtractor, Decoder, Encoder, Multiplexer, Demultiplexer COUT5: The students will learn how to design Sequential circuits like Flip Flops, Counters
18.	**EVS102-18 Environmental Studies**	COUT1: Students will enable to understand environmental problems at local and national level through literature and general awareness. COUT2: The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who have done practical work on various environmental Issues. COUT3: The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate these problems. COUT4: Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world
19.	**BMPD202-18 Mentoring and Professional Development**	COUT1: Build and support effective relationships COUT2: Create a mentor personality profile. COUT3: Effective skills identification and analysis. COUT4: Mentoring and coaching as elements of professional growth.
20.	**UGCA1913**	COUT1: familiar with the different Network Models.

	Computer Networks	COUT2: Understand different network technologies and their application. COUT3: update with different advanced network technologies that can be used to connect different networks COUT4: familiar with various hardware and software that can help run a smooth network
21.	**UGCA1914 Programming in Python**	COUT1: Familiar with Python environment, data types, operators used in Python. COUT2: Compare and contrast Python with other programming languages. COUT3: Learn the use of control structures and numerous native data types with their methods. COUT4: Design user defined functions, modules, and packages and exception handling methods. COUT5: Create and handle files in Python and learn Object Oriented Programming Concepts.
22.	**UGCA1915 Data Structures**	COUT1: Apply appropriate constructs of Programming language, coding standards for application development COUT2: Use appropriate data structures for problem solving and programming COUT3: Use algorithmic foundations for solving problems and programming COUT4: Apply appropriate searching and/or sorting techniques for application development. COUT5: Develop programming logic and skills.
23.	**UGCA1916 Computer Networks Laboratory**	COUT1: Understand different network technologies and their application. COUT2: Be updated with different advanced network technologies that can be used to connect different networks COUT3: Be familiar with various hardware and software that can help run a smooth network
24.	**UGCA1917: Programming in Python Laboratory**	COUT1: Solve simple to advanced problems using Python language. COUT2: Develop logic of various programming problems using numerous data types and control structures of Python. COUT3: Implement different data structures. COUT4: Implement modules and functions. COUT5: Design and implement the concept of object oriented programming structures.

		COUT6: Implement file handling.
25.	**UGCA1918: Data Structures Laboratory**	COUT1: Apply appropriate constructs of Programming language, coding standards for application development COUT2: Develop programming skills for solving problems. COUT3: Apply appropriate searching and/or sorting techniques for application development.
26.	**UGCA1919 PC Assembly & Troubleshooting**	COUT1: Assemble and set up computer systems. COUT2: Configure and install computers COUT3: Install, connect and configure various peripheral devices COUT4: Diagnose and Troubleshoot issues in Computer Systems
27.	**UGCA1920 PC Assembly & Troubleshooting Laboratory**	COUT1: Assemble and set up computer systems. COUT2: Configure and install computers COUT3: Install, connect and configure various peripheral devices COUT4: Diagnose and Troubleshoot issues in Computer Systems
28.	**BMPD302-18 Mentoring and Professional Development**	COUT1: Build and support effective relationships COUT2: Create a mentor personality profile. COUT3: Effective skills identification and analysis. COUT4: Mentoring and coaching as elements of professional growth.
29.	**UGCA1921 Software Engineering**	COUT1: Aware about the engineering approach to analysis, design and built the software COUT2: Understand the phases and activities involved in the conventional software life cycle models COUT3: Analyse problems, and identify and define thecomputing requirements appropriate to its solution. COUT4: Apply design and development principles in the construction of software systems of varying complexity COUT5: Apply current techniques, skills, and tools necessary for computing practice
30.	**UGCA1922: Database Management Systems**	COUT1: Understand the basic concepts of DBMS. COUT2: Formulate, using SQL, solutions to a broad range of query and data update problems. COUT3: Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.

		COUT4: Understand the concept of Transaction and Query processing in DBMS.
31.	**UGCA1923 Operating Systems**	COUT1: Discuss the evaluation of operating systems. COUT2: Explain different resource managements performed by operating system. COUT3: Describe the architecture in terms of functions performed by different types of operating systems. COUT4: Analyze the performance of different algorithms used in design of operating system components.
32.	**UGCA1924 Software Engineering Laboratory**	COUT1: Elicit, analyze and specify software requirements. COUT2: Analyze and translate a specification into a design COUT3: Realize design practically, using an appropriate software engineering methodology. COUT4: Plan a software engineering process life cycle. COUT5: Use modern engineering tools for specification, design, implementation, and testing
33.	**UGCA1925 Database Management Systems Laboratory**	COUT1: Able to understand various queries and their execution COUT2: Populate and query a database using SQL DML/DDL commands. COUT3: Declare and enforce integrity constraints on a database COUT4: Programming PL/SQL including stored procedures, stored functions, cursors, packages COUT5: Able to design new database and modify existing ones for new applications and reason about the efficiency of the result
34.	**UGCA1926: Operating Systems Laboratory**	COUT1: Install & configure different operating systems. COUT2: Write programs/ scripts for different scheduling algorithms.
35.	**UGCA1927: Web Designing**	COUT1: Understand the core concepts of Internet and Web Services. COUT2: Describe and differentiate Programming Language and Markup Language. COUT3: List various web pages and web sites together. COUT4: Capture user input from the remote users. COUT5: Learn connectivity concepts of Front End and Back End process

36.	**UGCA1928: Web Designing Laboratory**	COUT1: Implement Static/Dynamic concepts of web designing. COUT2: Develop ability to retrieve data from a database and present it in a web page COUT3: Design web pages that apply various dynamic effects on the web site.
37.	**BMPD402-18 Mentoring and Professional Development**	COUT1: Build and support effective relationships COUT2: Create a mentor personality profile. COUT3: Effective skills identification and analysis. COUT4: Mentoring and coaching as elements of professional growth.
38.	**UGCA1929: Programming in PHP**	COUT1: Learn the environment of Server Side Script. COUT2: Compare and contrast between Client Side Script & Server Side Script. COUT3: Learn the use of control structures and numerous native data types with their methods. COUT4: Make Database connectivity between Front End and Back End COUT5: Develop Dynamic Website that can interact with different kinds of Database Languages.
39.	**UGCA1930: Programming in PHP Laboratory**	COUT1: Solve simple to advanced online problems of Web Pages. COUT2: Develop logics of various programming problems using numerous data types and control structures. COUT3: Client Server concepts, Static & Dynamic environment of the websites etc. COUT4: Design and implement the concept of Database connectivity. COUT5: Front-End & Back-End concept of Database System.
40.	**UGCA1957 Software Project Management**	COUT1: Understand the principal tasks of software project managers, and basic concepts in software projects COUT2: Explain the fundamentals of Process Planning, effort estimation and quality planning. COUT3: Plan software projects including risk and quality management. COUT4: Apply different management and development practices that affect software.

41.	**UGCA1932 Programming in Java**	COUT1: Familiarize with the concept of Object Oriented concepts by implementing Java Programming. COUT2: Learn the concepts of classes & objects with the features of reusability and implementation of the same with various control structures to solve real world problems. COUT3: Understand and design built-in and user defined functions/methods, interfaces and packages etc. COUT4: Handle various types of data using arrays & strings and handling of exceptions occurred in programs. COUT5: Utilize multithreading and applet features of Java for efficient and effective programming COUT6: Create and handle files in Java
42.	**UGCA1935 Linux Operating System**	COUT1: Discuss the evolution of Open Source operating systems. COUT2: Operate open source operating system like Linux. COUT3: Create scripts in Linux. COUT4: Implement advanced concepts using open source operating system.
43.	**UGCA1938 Programming in Java Laboratory**	COUT1: Implement Core Java concepts. COUT2: Solve computational problems using various operators of Java. COUT3: Design solutions to complex by handling exceptions that may occur in the programs. COUT4: Solve complex and large problems using the concept of multithreading. COUT5: Implement interfaces and design packages.
44.	**UGCA1941 Linux Operating System Laboratory**	COUT1: Installation & administration of Linux operating system COUT2: Implementing various services on Linux operating system.
45.	**Minor Project**	COUT1: 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.
46.	**Institutional Summer Training**	COUT1: Provide students the in-depth corporate knowledge of a function. COUT2: Gives the students a change to apply into actual practice the fundamentals that they learnt in there course curriculum

		COUT3: To provide a piece of knowledge of working life for students who do not have a work experience COUT4: Get thorough insight into Industry Standard. COUT5: Hands on Demonstrations of Latest Technologies.
47.	**BMPD502-18 Mentoring and Professional Development**	COUT1: Build and support effective relationships COUT2: Create a mentor personality profile. COUT3: Effective skills identification and analysis. COUT4: Mentoring and coaching as elements of professional growth.
48.	**UGCA1943: Android Programming**	COUT1: Students will be able to do work on Android OS. COUT2: Students will be able to create different type of Android based applications. COUT3: Students will be able to discuss various security issues in Android platform. COUT4: Students will be able to implement various database applications and content providers. COUT5: Students will be able to differentiate among various types of operating systems.
49.	**UGCA1944: Android Programming Laboratory**	COUT1: Students will be able to do work on Android OS. COUT2: Students will be able to create different type of Android based applications. COUT3: Students will be able to discuss various security issues in Android platform COUT4: Students will be able to implement various database applications and content providers. COUT5: Students will be able to design User Interface and develop activity for android app.
50.	**UGCA1903 Problem Solving using C**	COUT1: Student should be able to understand the logic building used in Programming. COUT2: Students should be able to write algorithms for solving various real life problems. COUT3: To convert algorithms into programs using C
51.	**UGCA1945 Artificial Intelligence**	COUT1: Understand the significance and domains of Artificial Intelligence and knowledge representation. COUT2: Examine the useful search techniques; learn their advantages, disadvantages and comparison. COUT3: Understand important concepts like Expert Systems, AI applications. COUT4: Be exposed to the role of AI in different areas like NLP, Pattern Recognition etc.

		COUT5: Learn the practical applicability of intelligent systems, specifically its applications.
52.	**UGCA1948 Information Security**	COUT1: Acquire a practical overview of the issues involved in the field of information security. COUT2: Demonstrate a basic understanding of the practice of information security. COUT3: To understand the information security risks across diverse settings including the Internet and WWW based commerce systems.
53.	**UGCA1951 Artificial Intelligence Laboratory**	COUT1: Developing simple applications using AI tools. COUT2: Attain the capability to represent various real life problem domains using logic based techniques and use this to perform inference or planning. COUT3: Formulate and solve problems with uncertain information using Bayesian approaches. COUT4: Apply concept Natural Language processing to problems leading to understanding of cognitive computing.
54.	**UGCA1954 Information Security Laboratory**	COUT1: Acquire a practical overview of the issues involved in the field of information security. COUT2: Demonstrate a basic understanding of the practice of information security. COUT3: Explore the idea that in Information Security answers are not always known, and proposed solutions could give rise to new, equally complex problems. COUT4: Student will be able to develop the understating about information security
55.	**Major 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.
56.	**BMPD602- 18 Mentoring and Professional Development**	COUT1: Build and support effective relationships COUT2: Create a mentor personality profile. COUT3: Effective skills identification and analysis. COUT4: Mentoring and coaching as elements of professional growth.

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 complexproblems 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.

PO-5: **Critical Thinking:** Utilize the principles of scientific enquiry, thinking analytically, and critically, for solving pharmaceutical problems and drawing decisions.

PROGRAMME SPECIFIC OUTCOMES

PSO1

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.

Course Outcomes of B. Pharmacy

Serial No.	***Course Code and Name***	***Course Outcomes***
1.	**BP101T Human Anatomy and Physiology- I**	COUT1. Explain the gross morphology, structure and functions of various organs of the human body. COUT2. Describe the various homeostatic mechanisms and their imbalances. COUT3. Identify the various tissues and organs of different systems of human body.
2.	**BP102T Pharmaceutical Analysis-I**	COUT1. Understand the principles of volumetric and electro chemical analysis. COUT2. Develop analytical skills.
3.	**BP103T Pharmaceutics- I**	COUT1. Know the history of profession of pharmacy. COUT2. Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations. COUT3. Understand the professional way of handling the prescription.
4.	**BP104T Pharmaceutical Inorganic Chemistry**	COUT1. Know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals. COUT2. Understand the medicinal and pharmaceutical importance of inorganic compounds.
5.	**BP105T Communication Skills**	COUT1. Communicate effectively (Verbal and Non Verbal). COUT2. Effectively manage the team as a team player. COUT3. Develop interview skills.
6.	**BP106RBT Remedial Biology**	COUT1. Know the classification and salient features of five kingdoms of life. COUT2. Understand the basic components of anatomy and physiology of plant. COUT3. Know understand the basic components of anatomy and physiology animal withspecial reference to human

7.	**BP106RMT Remedial Mathematics**	COUT1. Know the theory and their application in Pharmacy. COUT2. Solve the different types of problems by applying theory. COUT3. Appreciate the important application of mathematics in Pharmacy.
8.	**BP201T Human Anatomy and Physiology-II**	COUT1.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. COUT2. Appreciate coordinated working pattern of different organs of each system. COUT3. Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body
9.	**BP202T Pharmaceutical Organic Chemistry-I**	COUT1. Write the structure, name and the type of isomerism of the organic compound. COUT2. Write the reaction, name the reaction and orientation of reactions. COUT3. Account for reactivity/stability of compounds.
10	**BP203T Biochemistry**	COUT1. Understand the catalytic role of enzymes, importance of enzyme inhibitors in design ofnew drugs, therapeutic and diagnostic applications of enzymes. COUT2. Understand the metabolism of nutrient molecules in physiological and pathologicalconditions. COUT3. Understand the genetic organization of mammalian genome and functions of DNA in thesynthesis of RNAs and proteins.
11.	**BP204T Pathophysiology**	COUT1. Describe the etiology and pathogenesis of the selected disease states. COUT2. Name the signs and symptoms of the diseases. COUT3. Mention the complications of the diseases.
12.	**BP205T Computer Applications in Pharmacy**	COUT1. Know the various types of application of computers in pharmacy. COUT2. Know the various types of databases. COUT3. Know the various applications of databases in pharmacy.
13.	**BP206T**	COUT1. Create the awareness about environmental problems among learners.

	Environmental Sciences	COUT2. Impart basic knowledge about the environment and its allied problems. COUT3. Develop an attitude of concern for the environment.
14.	**BP301T Pharmaceutical Organic Chemistry –II**	COUT1.To Write the reaction, name the reaction and orientation of reactions. COUT2. Account for reactivity/stability of compounds. COUT3. Prepare organic compounds.
15.	**BP302T Physical Pharmaceutics-I**	COUT1. Understand various physicochemical properties of drug molecules in the designing thedosage forms. COUT2. Know the principles of chemical kinetics and to use them for stability testing anddetermination of expiry date of formulations. COUT3. Demonstrate use of physicochemical properties in the formulation development andevaluation of dosage forms.
16.	**BP303T Pharmaceutical Microbiology**	COUT1. Understand methods of identification, cultivation and preservation of variousmicroorganisms. COUT2. To understand the importance and implementation of sterilization in pharmaceuticalprocessing and industry Learn sterility testing of pharmaceutical products. COUT3. Carried out microbiological standardization of pharmaceuticals. COUT4. Understand the cell culture technology and its applications in pharmaceutical industries.
17.	**BP304T Pharmaceutical Engineering**	COUT1. To know various unit operations used in Pharmaceutical industries. COUT2. To understand the material handling techniques. COUT3. To perform various processes involved in pharmaceutical manufacturing process. COUT4. To carry out various test to prevent environmental pollution
18.	**BP401T Pharmaceutical Organic Chemistry – III**	COUT1. Understand the methods of preparation and properties of organic compounds. COUT2. Explain the stereo chemical aspects of organic compounds and stereo chemical reactions.

		COUT3. Know the medicinal uses and other applications of organic compounds
19.	**BP402T** **Medicinal Chemistry – I**	COUT1. Understand the chemistry of drugs with respect to their pharmacological activity. COUT2. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs. COUT3. Know the Structural Activity Relationship (SAR) of different class of drugs. COUT4. Write the chemical synthesis of some drugs
20.	**BP403T** **Physical Pharmaceutics-II**	COUT1. Understand various physicochemical properties of drug molecules in the designing the dosage forms COUT2. Know the principles of chemical kinetics and to use them for stability testing and determination of expiry date of formulations COUT3. Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms
21.	**BP404T** **Pharmacology-I**	COUT1. Understand the pharmacological actions of different categories of drugs. COUT2. Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels. COUT3. Apply the basic pharmacological knowledge in the prevention and treatment of various diseases. COUT4. Observe the effect of drugs on animals by simulated experiments. COUT5. Appreciate correlation of pharmacology with other bio medical sciences.
22.	**BP405T** **Pharmacognosy And Phytochemistry–I**	COUT1. To know the techniques in the cultivation and production of crude drugs. COUT2. To know the crude drugs, their uses and chemical nature. COUT3. Know the evaluation techniques for the herbal drugs. COUT4. To carry out the microscopic and morphological evaluation of crude drugs
23.	**BP501T**	COUT1. Understand the chemistry of drugs with respect to their pharmacological activity.

	Medicinal Chemistry – II	COUT2. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs. COUT3. Study the chemical synthesis of selected drugs.
24.	**BP502T** **Industrial Pharmacy-I**	COUT1. Know the various pharmaceutical dosage forms and their manufacturing techniques. COUT2. Know various considerations in development of pharmaceutical dosage forms. COUT3. Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality.
25.	**BP503T** **Pharmacology-II**	COUT1. Understand the mechanism of drug action and its relevance in the treatment of different diseases. COUT2. Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments. COUT3. Demonstrate the various receptor actions using isolated tissue preparation
26.	**BP504T** **Pharmacognosy and Phytochemistry-II**	COUT1.To know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents. COUT2. To understand the preparation and development of herbal formulation. COUT3. To carryout isolation and identification of phytoconstituents.
27.	**BP505T** **Pharmaceutical Jurisprudence**	COUT1. The Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals. COUT2. Various Indian pharmaceutical Acts and Laws. COUT3. The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals. COUT4. The code of ethics during the pharmaceutical practice
28.	**BP601T** **Medicinal Chemistry – III**	COUT1. Understand the importance of drug design and different techniques of drug design. COUT2. Understand the chemistry of drugs with respect to their biological activity. COUT3. Know the metabolism, adverse effects and therapeutic value of drugs

29.	**BP602T** **Pharmacology –III**	COUT1. Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases. COUT2. Comprehend the principles of toxicology and treatment of various poisonings. COUT3. Appreciate correlation of pharmacology with related medical sciences.
30.	**BP603T** **Herbal Drug Technology**	COUT1. Understand raw material as source of herbal drugs from cultivation to herbal drug product. COUT2. Know the WHO and ICH guidelines for evaluation of herbal drugs. COUT3. Know the herbal cosmetics, natural sweeteners, and nutraceuticals. COUT4. Appreciate patenting of herbal drugs, GMP.
31.	**BP604T** **Biopharmaceutics& Pharmacokinetics**	COUT1. Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance. COUT2. Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination. COUT3. To understand the concepts of bioavailability and bioequivalence of drug products and their significance.
32.	**BP605T** **Pharmaceutical Biotechnology**	COUT1. Understanding the importance of Immobilized enzymes in Pharmaceutical Industries. COUT2. Genetic engineering applications in relation to production of pharmaceuticals. COUT3. Importance of Monoclonal antibodies in Industries.
33.	**BP606T** **Quality Assurance**	COUT1. Understand the cGMP aspects in a pharmaceutical industry. COUT2. Appreciate the importance of documentation. COUT3. Understand the scope of quality certifications applicable to pharmaceutical industries. COUT4. Understand the responsibilities of QA & QC departments.

34.	**BP701T Instrumental Methods Of Analysis**	COUT1. Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis. COUT2. Understand the chromatographic separation and analysis of drugs. COUT3. Perform quantitative & qualitative analysis of drugs using various analytical instruments.
35.	**BP702T Industrial Pharmacy-II**	COUT1. Know the process of pilot plant and scale up of pharmaceutical dosage forms. COUT2. Understand the process of technology transfer from lab scale to commercial batch. COUT3. Know different Laws and Acts that regulate pharmaceutical industry. COUT4. Understand the approval process and regulatory requirements for drug products.
36.	**BP703T Pharmacy Practice**	COUT1. Know various drug distribution methods in a hospital. COUT2. Appreciate the pharmacy stores management and inventory control. COUT3. Monitor drug therapy of patient through medication chart review and clinical review.
37.	**BP704T Novel Drug Delivery Systems**	COUT1. To understand various approaches for development of novel drug delivery systems. COUT2. 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**	COUT1. Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment). COUT2. Know the various statistical techniques to solve statistical problems. COUT3. Appreciate statistical techniques in solving the problems.
39.	**BP802T Social & Preventive Pharmacy**	COUT1. Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.

		COUT2. Have a critical way of thinking based on current healthcare development. COUT3. Evaluate alternative ways of solving problems related to health and pharmaceutical issues.
40.	**BP803ET** **Pharma Marketing Management**	COUT1. The course aims to provide an understanding of marketing concepts and techniques and their applications in the pharmaceutical industry
41.	**BP804ET** **Pharmaceutical Regulatory Science**	COUT1. Know about the process of drug discovery and development COUT2. Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals COUT3. Know the regulatory approval process and their registration in Indian and international Markets
42.	**BP805ET** **Pharmacovigilance**	COUT1. Why drug safety monitoring is important? COUT2. History and development of pharmacovigilance. COUT3. National and international scenario of pharmacovigilance. COUT4. Dictionaries, coding and terminologies used in pharmacovigilance.
43.	**BP806ET** **Quality Control & Standardization of Herbals**	COUT1. Know WHO guidelines for quality control of herbal drugs. COUT2. Know Quality assurance in herbal drug industry. COUT3. Know the regulatory approval process and their registration in Indian and international markets. COUT4. Appreciate EU and ICH guidelines for quality control of herbal drugs.
44.	**BP807ET** **Computer Aided Drug Design**	COUT1. Design and discovery of lead molecules. COUT2. The role of drug design in drug discovery process. COUT3. The concept of QSAR and docking. COUT4. Various strategies to develop new drug like molecules
45.	**BP808ET** **Cell And Molecular Biology**	COUT1. Summarize cell and molecular biology history. COUT2. Summarize cellular functioning and composition. COUT3. Describe the chemical foundations of cell biology.

		COUT4. Summarize the DNA properties of cell biology.
46.	**BP810ET Experimental Pharmacology**	COUT1. Appreciate the applications of various commonly used laboratory animals. COUT2. Appreciate and demonstrate the various screening methods used in preclinical research. COUT3. Appreciate and demonstrate the importance of biostatistics and research methodology. COUT4. Design and execute a research hypothesis independently.
47.	**BP811ET Advanced Instrumentation Techniques**	COUT1. Understand the advanced instruments used and its applications in drug analysis. COUT2. Understand the chromatographic separation and analysis of drugs. COUT3. Understand the calibration of various analytical instruments COUT4.. Know analysis of drugs using various analytical instruments
48.	**BP812ET Dietary Supplements & Nutraceuticals**	COUT1. Understand the need of supplements by the different group of people to maintain healthy life. COUT2. Understand the outcome of deficiencies in dietary supplements. COUT3. Appreciate the components in dietary supplements and the application. COUT4. 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

PSO

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:

S. No	Subject	Course Outcome
1.	**BMLS101-18 Essential Biology**	COUT1. To train the students in understanding basic of cell, biomolecules and about genetics. COUT2. Understand the basic components of anatomy and physiology of human body.
2.	**BMLS102-18 General Microbiology**	COUT1. 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**	COUT1. Understand the catalytic role of enzymes, importance of enzyme inhibitors in design ofnew drugs, therapeutic and diagnostic applications of enzymes. COUT2. Imparts knowledge of apparatus, units, equipments, volumetric analysis in the laboratory of biochemistry
4.	**BTHU103-18 English**	COUT1. The objective of this course is to introduce students to the theory, fundamentals and tools of communication. COUT2. To help the students become the independent users of English language.
5.	**HVPE101-18 Human Values, De-addiction and Traffic Rules**	COUT1. 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. COUT2. 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**	COUT1. This subject will give information about the different types of bacterial culture procedures, staining procedures and Biochemical tests used for identification of bacteria. COUT2. The students will learn the morphology cultural characteristics, biochemical characteristics & laboratory diagnosis of various bacteria.
7.	**BMLS202-18 Biochemical Metabolism**	COUT1. This subject shall give information about all the major metabolic pathways occurring in our body. COUT2. 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**	COUT1. 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. COUT2. 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**	COUT1. Create the awareness about environmental problems among learners. COUT2. Impart basic knowledge about the environment and its allied problems
10.	**BMLS301-18 Basic Hematological&Hematological Techniques-I**	COUT1. The students will be made aware of the composition of blood and methods of estimating different components of blood. COUT2. Students will be able to know the basic concepts of Haematology& routine clinical investigations of Haematology laboratory

11.	**BMLS302-18 Analytical Biochemistry**	COUT1. 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**	COUT1. 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**	COUT1. 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. COUT2. This will also cover Bacteriological examination of water, milk, food and air and nosocomial infections.
14.	**BMLS401-18 Basic Cellular Pathology**	COUT1. Describe the etiology and pathogenesis of the selected disease states. COUT2. Diseases associated with different body organs and systems.
15.	**BMLS402-18 Basic Haematological Techniques – II**	COUT1. The students will learn about normal and abnormal haemoglobin and different aspects of Normal haemostatic mechanism and theories of blood coagulation. COUT2. They will also learn the estimation of different parameters of coagulation studies.
16.	**BMLS403-18 Clinical Biochemistry – I**	COUT1. Hazards & safety measures in clinical Biochemistry laboratory. COUT2. Quality control and quality assurance in a clinical biochemistry laboratory
17.	**BMLS407-18 Immunology and Mycology**	COUT1.Basic aspects of immunity, antigens, antibodies, various serological reactions, techniques and their utility in laboratory diagnosis of human diseases. COUT2. It will also cover medically important fungi, infections caused by them and their laboratory diagnosis.

18.	**BMLS501-18 Applied Haematology-I**	COUT1. The students be made aware of Safety precautions, Quality assurance, biomedical waste management and automation in haematology. COUT2.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**	COUT1. 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**	COUT1. 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**	COUT1. The students will learn about the various methods of patients sample analysis for biochemistry parameters. COUT2. 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**	COUT1. Imparts knowledge about Causes, Diagnosis and treatment of various blood diseases. COUT2. Also acknowledge about production of blood and its components.

23.	**BMLS603-18 Blood Banking**	COUT1. This subject will make students learn about blood grouping & blood transfusion. COUT2. 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**	COUT1. Gives introduction, general characteristics, life cycle and laboratory diagnosis of various Medically important parasites. COUT2. Knowledge about diseases caused by medically important viruses, samples collection and laboratory diagnosis of some important viral infections.
25.	**BMLS605-18 Histotechnology – II & Cytology**	COUT1. Tells about various staining procedures for demonstration of different substances & various cytological investigations. COUT2.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)**	**Course Outcome:** At the end of the course the student should be able to 1. Comprehend the fundamentals of horticulture in terms of its value 2. Propagate horticultural plants and trees 3. Design orchards and landscapes for architectural firms 4. Decide on the crops, fertilizers and irrigation measures to be followed by farmers

		5. Develop career interest in the field of horticulture
2.	**BSAG-102-19 Fundamentals of Soil Science (Theory)**	**Course Outcome:** At the end of the course the student should be able to 1. Acquire knowledge on the importance of soil to agriculture 2. Value the physical properties of soil 3. Classify soil type, soil texture and soil structure required for an agricultural field 4. Analyze soil, water and nutrients related to crop growth 5. State techniques to mitigate soil pollution 6. Identify soil related problems in agricultural fields and provide suitable solutions
3.	**BSAG-103-19 Introduction to Forestry (Theory)**	**Course Outcome:** At the end of the course the student should be able to 1. Recognize the importance of forestry 2. Explain and appreciate the techniques involved in forest regeneration 3. Describe mensuration techniques to quantify forests data 4. Plan to regenerate a forest 5. Prepare an agroforestry system to support human sustenance
4.	**BSAG-104-19 Comprehension and Communication Skills in English (Theory)**	**Course Outcome:** At the end of the course the student should be able to . Analyze grammatical errors 2. Identify correct pronunciation 3. Express writing skills 4. Comprehend the course materials of all courses and improve oral communication skills

		5. Demonstrate presentationskills 6. Illustrate communication skills
5.	**BSAG-105-19 Fundamentals ofAgronomy (Theory)**	**Course Outcome:** At the end of the course the student should be able to 1. Express knowledge gained on the principles of agronomy 2. Recognize the various nutrients and their effects on plant health 3. Plan irrigation measures for plant growth and development 4. Manage weeds in a field 5. Plan for sustainable agricultural production 6. Apply scientific methods and tools in field preparation and for designing cropping
6.	**BSAG-106-19(A)Introductory,Biology (Theory)**	**Course Outcome:** At the end of the course the student should be able to 1. Compare living organisms 2. Classify and name living beings 3. Describe cell and its division 4. Interpret flowering plants and state the role of animals in agriculture 5. Illustrate theory of life 6. Describe plant organs and gain interest in learning biological sciences
7.	**BSAG-106-19(B) ElementaryMathematics**	**Course Outcome:** At the end of the course the student should be able to 1. Device formulas for straight lines 2. Comprehend the use of Slope-Intercept 3. Apply the knowledge gained in designing fields 4. Acquire interest to utilize calculus in agriculture 5. Integrate product of functions and define matrices and determinants 6. Link mathematics with agricultural engineering
8.	**BSAG-107-19 Agricultural Heritage**	**Course Outcome:** At the end of the course the student should be able to

		1. Appreciate agriculture practiced throughout the world 2. Understand the rich agricultural heritage of India 3. Integrate judicious traditional agricultural practices with modern methods 4. Plan on using agricultural resources 5. Comprehend agricultural issues
9.	**BSAG-108-19 Rural Sociology & Educational Psychology**	**Course Outcome:** At the end of the course the student should be able to 1. Classify rural social groups of India 2. Describe social values 3. Plan social change using agricultural based development programs 4. Assess farmers based on personality determinants 5. Plan to bring in a behavioural change 6. Bring in new extension activities suitable for the society
10.	**BSAG-109-1 Human Value and Ethics**	**Course Outcome:** At the end of the course the student should be able to 1. The students identify the importance of human values and skills for sustained happiness. 2. The students strike a balance between profession and personal happiness/ goals. 3. The students realize/ explain the significance of trust, mutually satisfying human behavior and enriching interaction with nature. 4. 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)**	**Course Outcome:** At the end of the course the student should be able to 1. Comprehend the fundamentals of horticulture in terms of its value 2. Propagate horticultural plants and trees 3. Design orchards and landscapes for architectural firms 4. Decide on the crops, fertilizers and irrigation measures to be followed by farmers 5. Develop career interest in the field of horticulture
12.	**BSAG-111-19 Fundamentals of Soil Science(Practical)**	**Course Outcome:** At the end of the course the student should be able to 1. Acquire knowledge on the importance of soil to agriculture 2. Value the physical properties of soil 3. Classify soil type, soil texture and soil structure required for an agricultural field 4. Analyze soil, water and nutrients related to crop growth 5. State techniques to mitigate soil pollution 6. Identify soil related problems in agricultural fields and provide suitable solutions
13.	**BSAG-112-19 Introduction to Forestry (Practical)**	**Course Outcome:** At the end of the course the student should be able to 1. Recognize the importance of forestry 2. Explain and appreciate the techniques involved in forest regeneration 3. Describe mensuration techniques to quantify forestsdata 4. Plan to regenerate a forest 5. Prepare an agroforestry system to support human sustenance
14.	**BSAG-113-19 Comprehension and Communication Skills in**	**Course Outcome:** At the end of the course the student should be able to . Analyze grammatical errors 2. Identify correct pronunciation 3. Express writing skills

	English (Practical)	4. Comprehend the course materials of all courses and improve oral communication skills 5. Demonstrate presentationskills 6. Illustrate communication skills
15.	**BSAG-114-19 Fundamentals of Agronomy(Practical)**	**Course Outcome:** At the end of the course the student should be able to 1. Express knowledge gained on the principles of agronomy 2. Recognize the various nutrients and their effects on plant health 3. Plan irrigation measures for plant growth and development 4. Manage weeds in a field 5. Plan for sustainable agricultural production 6. Apply scientific methods and tools in field preparation and for designing cropping
16.	**BSAG-115-19 Introductory Biology(Practical)**	**Course Outcome:** At the end of the course the student should be able to 1. Compare living organisms 2. Classify and name living beings 3. Describe cell and its division 4. Interpret flowering plants and state the role of animals in agriculture 5. Illustrate theory of life 6. Describe plant organs and gain interest in learning biological sciences
17.	**BSAG-116-19 NSS / NCC / Physical Education and Yoga**	**Course Outcome:** At the end of the course the student should be able to 1. Infer physical and mental discipline 2. Practice the gained skills to stay physically fit 3. Develop stamina and improve health and hygiene 4. Improve inter personal skills and work well in a group 5. Develop self-confidence 6. Plan in achieving goals

18.	**BSAG201-Fundamentals ofGenetics ((Theory)**	**Course Outcome:** At the end of the course the student should be able to 1. Apply the knowledge gained on inheritance and variation 2. Develop problem-solving skills pertaining to inheritance 3. Relatemutation to evolution and heredity 4. Interpret the functions of genetic material. 5. Solve and analyze problems in basic genetics
19.	**BSAG202-19 Agricultural Microbiology (Theory)**	**Course Outcome:** At the end of the course the student should be able to **1.** Discriminate prokaryotic and eukaryotic microbes 2. Delineate the structure and growth of bacteria 3. Utilize microbes as models to study genetics 4. Use microbes inenriching specific plant nutrients 5. Analyze the ubiquitous nature of microbes inhabiting a wide range of ecological habitats 6. Practice bacterial isolation
20.	**BSAG203-19 SoilandWaterConservationEngineering (Theory)**	**Course Outcome:** At the end of the course the student should be able to 1. Apply different surveying methods to measure area in agricultural field 2. Determine soil loss for a specific area based on erosivity and erodibility factor 3. Relate different techniques to control wind erosion 4. Apply rain water harvesting methods to conserve water 5. Interpret case studies related to soil and water conservation 6. Design irrigation systems and plan erosion control measures

21.	**BSAG204-19** **Fundamentals of Crop Physiology (** **(Theory)**	**Course Outcome:** At the end of the course the student should be able to 1. Define different physiological process at plant and cellular level 2. Summarize mechanisms of uptake, transport and translocation of water and nutrients 3. Distinguish carbon cycles in plants and define lipid metabolism 4. Relate the importance of growth regulators in plant growth 5. Explain nutrient deficiencies and physiological requirements of plants 6. Interpret and measure plant physiological data
22.	**BSAG205-19 FundamentalsofAgriculturalEconomics (Theory)**	**Course Outcome:** At the end of the course the student should be able to 1. Apply the knowledge gained on the fundamentals of economics 2. Employ agricultural economic applications 3. Practice applyingmathematical models to agro-economics 4. Interpret market structures responsible for creating national income 5. Analyze agro economic growth and develop policies 6. Integrate agro-economic knowledge with real time application
23.	**BSAG206-19 Fundamentals of Plant Pathology (Theory)**	**Course Outcome:** At the end of the course the student should be able to 1. Recognize the importance and scope of plant pathology and analyze the causes and factors leading to pathogenesis 2. Classify pathogens taxonomically for designing effective disease management strategies 3. Differentiate plant pathogens based on morphology, vegetative, reproductive and resting structures. 4. Relate disease cycles, physiology of pathogens and plant defense

		5. Describe epidemiology of plant diseases and strategies for disease management 6. Practice identifying and controlling pathogens
24.	**BSAG-207-19 Fundamentals of Entomology (Theory)**	**Course Outcome:** At the end of the course the student should be able to Express knowledge gained on the historic contributions of eminent scientists in the field of entomology and fascinating facts about insects 2. Describe insect's anatomy and morphology 3. Infer biochemical and physiological processes governing insect metabolism, growth, and form 4. Relate ecological relationships of insects with other life forms 5. Devise pest control measures 6. Identify insects based on their key taxonomic characters
25.	**BSAG-208-19 Fundamentals of Agricultural Extension Education (Theory)**	**Course Outcome:** At the end of the course the student should be able to 1. Realize the necessity of agricultural extension for rural development 2. Acquire knowledge on extension systems in India 3. Devise plans for rural community development; plan and evaluate an extension programme 4. Transfer technology and innovations towards agricultural development 5. Develop interest in agricultural journalism 6. Disseminate information and technology through audio visual aids
26.	**BSAG-209-19 Communication Skills and Personality Development (Theory)**	**Course Outcome:** At the end of the course the student should be able to . Analyze grammatical errors 2. Identify correct pronunciation 3. Express writing skills 4. Comprehend the course materials of all courses and improve oral communication skills

		5. Demonstrate presentation skills 6. Illustrate communication skills
27.	**BSAG210-19 Fundamental of Genetics (Practical)**	**Course Outcome:** At the end of the course the student should be able to 1. Apply the knowledge gained on inheritance and variation 2. Develop problem-solving skills pertaining to inheritance 3. Relatemutation to evolution and heredity 4. Interpret the functions of genetic material. 5. Solve and analyze problems in basic genetics
28.	**BSAG211-19 Agriculture Microbi (Practical)**	**Course Outcome:** At the end of the course the student should be able to **1. Discriminate prokaryotic and eukaryotic microbes** **2. Delineate the structure and growth of bacteria** **3. Utilize microbes as models to study genetics** **4. Use microbes inenriching specific plant nutrients** **5. Analyze the ubiquitous nature of microbes inhabiting a wide range of ecological habitats** **6. Practice bacterial isolation**
29.	**BSAG212-19** **Soil and Water Conservation Engineering(Practical)**	**Course Outcome:** At the end of the course the student should be able to 1. Apply different surveying methods to measure area in agricultural field 2. Determine soil loss for a specific area based on erosivity and erodibility factor 3. Relate different techniques to control wind erosion 4. Apply rain water harvesting methods to conserve water 5. Interpret case studies related to soil and water conservation 6. Design irrigation systems and plan erosion control measures

30.	**BSAG213-19** **Fundamentals of Crop Physiology(Practical)**	**Course Outcome:** At the end of the course the student should be able to 1. Define different physiological process at plant and cellular level 2. Summarize mechanisms of uptake, transport and translocation of water and nutrients 3. Distinguish carbon cycles in plants and define lipid metabolism 4. Relate the importance of growth regulators in plant growth 5. Explain nutrient deficiencies and physiological requirements of plants 6. Interpret and measure plant physiological data
31.	**BSAG214-19** **Fundamentals of Plant Pathology**	**Course Outcome:** At the end of the course the student should be able to 1. Recognize the importance and scope of plant pathology and analyze the causes and factors leading to pathogenesis 2. Classify pathogens taxonomically for designing effective disease management strategies 3. Differentiate plant pathogens based on morphology, vegetative, reproductive and resting structures. 4. Relate disease cycles, physiology of pathogens and plant defense 5. Describe epidemiology of plant diseases and strategies for disease management 6. Practice identifying and controlling pathogens
32.	**BSAG215-19** **Fundamentals of Entomology(Practical)** **Fundamentals of Entomology(Practical)**	**Course Outcome:** At the end of the course the student should be able to Express knowledge gained on the historic contributions of eminent scientists in the field of entomology and fascinating facts about insects 2. Describe insect's anatomy and morphology 3. Infer biochemical and physiological processes governing insect metabolism, growth, and form 4. Relate ecological relationships of insects with other life forms 5. Devise pest control

33.	**BSAG216-19 Fundamentals of Agricultural Extension Education(Practical**	**Course Outcome:** At the end of the course the student should be able to 1. Realize the necessity of agricultural extension for rural development 2. Acquire knowledge on extension systems in India 3. Devise plans for rural community development; plan and evaluate an extension programme 4. Transfer technology and innovations towards agricultural development 5. Develop interest in agricultural journalism 6. Disseminate information and technology through audio visual aids
34.	**BSAG217-19 Communication Skills and Personality Development (Practical)**	**Course Outcome:** At the end of the course the student should be able to .1 Analyze grammatical errors 2. Identify correct pronunciation 3. Express writing skills 4. Comprehend the course materials of all courses and improve oral communication skills 5. Demonstrate presentation skills 6. Illustrate communication skills
35.	**BSAG-301-19 Crop Production Technology – I (KharifCrops)**	**Course Outcome:** At the end of the course the student should be able to 1. Comprehend the fundamentals of crop production of cereals 2. Decide on the crops, fertilizers and irrigation measures for production of pulses 3. Plan for sustainable crop production of oilseeds 4. Explain the techniques involved in crop production of fibre and forage crops 5. Correlate parameters involved in crop cultivationand practice kharif crop cultivation
36.	**BSAG-302-19 Fundamentals of Plant Breeding**	**Course Outcome:** At the end of the course the student should be able to 1. Understand how humans have flourished due to breeding and domestication of plants

		2. Correlate the genetics behind breeding of crops 3. Comprehend breeding of crops 4. Exploit crops to express hybrid vigour 5. Realize the necessity of protecting farmers and breeders rights 6. Practice hybridisation and plan breeding experiments
37.	**BSAG-303-19 Agricultural Finance andCooperation**	**Course Outcome:** At the end of the course the student should be able to 1. Explain on agricultural finance and credit. 2. Comprehend the role of sources involved in farm financing
38.	**BSAG-304-19 Agri-Informatics**	**Course Outcome:** At the end of the course the student should be able to 1. Able to utilize operating systems like MS office and DBMS in agriculture 2. Comprehend programming languages 3. Use the internet for obtaining useful information regarding agriculture 4. Retrieve and generate information using geospatial technology 5. Relate contemporary ideas 6. Compute, create, operate and translate data using operating systems and IT tools
39.	**BSAG-305-19 Farm Machinery andPower**	**Course Outcome:** At the end of the course the student should be able to 1. Identify and differentiate two stroke and four stroke I.C engines 2. Distinguish different components and systems of IC engines 3. Compare different tillage implements used for various agricultural purposes 4. Classify various farm implements and comprehend its calibration methods 5. Estimate the cost benefit economics of various farm implements 6. Experiment with different equipment used in agricultural fields from planting to harvesting

40.	**BSAG-306-19 Production Technology for Vegetables andSpices**	**Course Outcome:** At the end of the course the student should be able to 1. Appreciate the importance of cultivating vegetables and spices 2. Demonstrate ideas on cultivating vegetables and spices 3. Understand the physiological disorders undermining the yield of vegetables and spices 4. Plan for commercial cultivation of vegetables and spices 5. Cultivate and demonstrate marketing of vegetables
41.	**BSAG-307-19 Environmental Studies and DisasterManagement**	**Course Outcome:** At the end of the course the student should be able to 1. Summarize natural sources and state the need for conserving the resources 2. Understand the functions of ecosystems 3. Comprehend the importance of conserving species on earth 4. Delineate manmade disasters and plan towards sustainable development 5. Demonstrate knowledge acquired in natural disaster management 6. Assess disaster issues based on knowledge gained and field work and design remedies
42.	**BSAG-308-19 StatisticalMethods**	**Course Outcome:** At the end of the course the student should be able to 1. Present and analyze scientific data 2. Solve problems on probability 3. Interpret statistical test outcomes 4. Design and analyze experiments 5. Appreciate the applications of statistical methods in science and engineering 6. Apply relevant statistical analysis to experimental data
43.	**BSAG-309-19 Livestock and PoultryManagement**	**Course Outcome:** At the end of the course the student should be able to 1. Understand the importance of livestock in human welfare

		2. Demonstrate knowledge on housing requirements for poultry and livestock 3. Handle the different life stages of livestock and select best breeds for growing 4. Design and ration feedstuffs for livestock 5. Mange and prevent the occurrence of livestock diseases 6. Rear livestock
44.	**BSAG-310-19 Crop Production Technology – I (Kharif Crops)(Practical**	**Course Outcome:** At the end of the course the student should be able to 1. Comprehend the fundamentals of crop production of cereals 2. Decide on the crops, fertilizers and irrigation measures for production of pulses 3. Plan for sustainable crop production of oilseeds 4. Explain the techniques involved in crop production of fibre and forage crops 5. Correlate parameters involved in crop cultivationand practice kharif crop cultivation
45.	**BSAG-311-19 Fundamentals of Plant Breeding (Practical**	**Course Outcome:** At the end of the course the student should be able to 1. Understand how humans have flourished due to breeding and domestication of plants 2. Correlate the genetics behind breeding of crops 3. Comprehend breeding of crops 4. Exploit crops to express hybrid vigour 5. Realize the necessity of protecting farmers and breeders rights 6. Practice hybridisation and plan breeding experiments
46.	**BSAG-312-19 Agricultural Finance and Cooperation(Practical)**	**Course Outcome:** At the end of the course the student should be able to 1. Explain on agricultural finance and credit. 2. Comprehend the role of sources involved in farm financing.

47.	**BSAG-313-19 Agri-Informatics(Practical)**	**Course Outcome:** At the end of the course the student should be able to 1. Able to utilize operating systems like MS office and DBMS in agriculture 2. Comprehend programming languages 3. Use the internet for obtaining useful information regarding agriculture 4. Retrieve and generate information using geospatial technology 5. Relate contemporary ideas 6. Compute, create, operate and translate data using operating systems and IT tools
48.	**BSAG-314-19 Farm Machinery and Power(Practical)**	**Course Outcome:** At the end of the course the student should be able to 1. Identify and differentiate two stroke and four stroke I.C engines 2. Distinguish different components and systems of IC engines 3. Compare different tillage implements used for various agricultural purposes 4. Classify various farm implements and comprehend its calibration methods 5. Estimate the cost benefit economics of various farm implements 6. Experiment with different equipment used in agricultural fields from planting to harvesting
49.	**BSAG-315-19 Production Technology for Vegetables and Spices (Practical)**	**Course Outcome:** At the end of the course the student should be able to 1. Appreciate the importance of cultivating vegetables and spices 2. Demonstrate ideas on cultivating vegetables and spices 3. Understand the physiological disorders undermining the yield of vegetables and spices 4. Plan for commercial cultivation of vegetables and spices 5. Cultivate and demonstrate marketing of vegetables

50.	**BSAG-316-19 Environmental Studies and Disaster Management(Practical**	**Course Outcome:** At the end of the course the student should be able to 1. Summarize natural sources and state the need for conserving the resources 2. Understand the functions of ecosystems 3. Comprehend the importance of conserving species on earth 4. Delineate manmade disasters and plan towards sustainable development 5. Demonstrate knowledge acquired in natural disaster management 6. Assess disaster issues based on knowledge gained and field work and design remedies
51.	**BSAG-317-19 Statistical Methods(Practical)**	**Course Outcome:** At the end of the course the student should be able to 1. Present and analyze scientific data 2. Solve problems on probability 3. Interpret statistical test outcomes 4. Design and analyze experiments 5. Appreciate the applications of statistical methods in science and engineering 6. Apply relevant statistical analysis to experimental data
52.	**BSAG-318-19 Livestock and Poultry Management (Practical)**	**Course Outcome:** At the end of the course the student should be able to 1. Understand the importance of livestock in human welfare 2. Demonstrate knowledge on housing requirements for poultry and livestock 3. Handle the different life stages of livestock and select best breeds for growing 4. Design and ration feedstuffs for livestock 5. Mange and prevent the occurrence of livestock diseases 6. Rear livestock
53.	**BSAG-401: Crop Production Technology – II (Rabi Crops)**	Course Outcome: At the end of the course the student should be able to 1. Comprehend the fundamentals of crop production of cereals

		2. Decide on the crops, fertilizers and irrigation measures for production of pulses 3. Plan for sustainable crop production of oilseeds 4. Explain the techniques involved in crop production of fibre and forage crops 5. Correlate parameters involved in crop cultivationand practice kharif crop cultivation
54.	**BSAG- 402: Production technology for ornamental crops, MAP and Landscaping**	Course Outcome: At the end of the course the student should be able to 1. Appreciate the importance of landscaping and growing of medicinal and aromatic plants. 2. Understand the requirements for land scaping. 3. Plan and practice propagation of cut flowers. 4. Explain the values of cultivating medicinal plants. 5. Design landscapes and practice cultivation of medicinal and aromatic plants.
55.	**BSAG-403: Renewable Energy and Green Technology**	Course Outcome: At the end of the course the student should be able to 1. Summarize the importance of renewable energy and its sources 2. Compare different biogas plants, its benefits, advantages and cost analysis 3. Discuss the importance of solar energy and their applications. 4. Explain the need of wind energy and energy components involved and their applications 5. Interpret merits and demerits of various renewable sources of energy 6. Design simple projects based on renewable energy systems
56.	**BSAG-404: Problematic Soils and their Management**	Course Outcome: At the end of the course the student should be able to 1. Comprehend the scenario of waste land and problem soils in India

		2. Understand reclamation of problematic soils 3. Acquire knowledge on water quality 4. State the role of remote sensing and GIS in diagnosis of problematic soils 5. Understand the remediation of soils under different agro-ecosystems 6. Explain management of problematic soils
57.	**BSAG-405:Production technology of fruits and Plantation crop.**	Course Outcome: At the end of the course the student should be able to 1. Analyze the scope of cultivating a fruit or 2. Define package of practices followed for t 3. Comprehend technology involved in growi 4. Define package of practices followed for n 5. Design an orchard 6. Develop one's career interest in pomiculture and plantation crops
58.	**BSAG-406: Principles of seed technology**	Course Outcome: At the end of the course the student should be able to 1 Comprehend seed production and seed quality 2. Demonstrate the concepts of seed certification, Seed Act and seed testing processes 3. Understand seed processing and seed storage techniques 4. State the norms of seed marketing in India. 5. Apply practical knowledge gained to commercially produce seeds and practice seed testing
59.	**BSAG-407: Farming System and sustainable agriculture**	Course Outcome: At the end of the course the student should be able to 1. Comprehend seed production and seed quality 2. Demonstrate the concepts of seed certification, Seed Act and seed testing processes 3. Understand seed processing and seed

		storage techniques 4. State the norms of seed marketing in India. 5. Apply practical knowledge gained to commercially produce seeds and practice seed testing
60	**BSAG- 408: Agricultural marketing rate and prices**	Course Outcome: At the end of the course the student should be able to 1. Explain the importance of agricultural marketing 2. Comprehend marketing strategies of agricultural products 3. Understand efficient marketing and the role of government and public sectors in marketing 4. Interpret agricultural commodity prices and policies 5. Discuss trade at national and international level 6. Device plans for agricultural product marketing
61.	**BSAG-409: Introductory Agrometeorology and climate change**	Course Outcome: At the end of the course the student should be able to
62.	**BSAG-410: Crop Production Technology – II (Rabi Crops) Practical)**	Course Outcome: At the end of the course the student should be able to 1. Comprehend the fundamentals of crop production of cereals 2. Decide on the crops, fertilizers and irrigation measures for production of pulses 3. Plan for sustainable crop production of oilseeds 4. Explain the techniques involved in crop production of fibre and forage crops 5. Correlate parameters involved in crop cultivationand practice kharif crop cultivation
63.	**BSAG- 411: Production technology for**	Course Outcome: At the end of the course the student should be able to

	ornamental crops, MAP and Landscaping (Practical)	1. Appreciate the importance of landscaping and growing of medicinal and aromatic plants. 2. Understand the requirements for land scaping. 3. Plan and practice propagation of cut flowers. 4. Explain the values of cultivating medicinal plants. 5. Design landscapes and practice cultivation of medicinal and aromatic plants.
64.	**BSAG-412: Renewable Energy and Green Technology (Practical)**	Course Outcome: At the end of the course the student should be able to 1. Summarize the importance of renewable energy and its sources 2. Compare different biogas plants, its benefits, advantages and cost analysis 3. Discuss the importance of solar energy and their applications. 4. Explain the need of wind energy and energy components involved and their applications 5. Interpret merits and demerits of various renewable sources of energy 6. Design simple projects based on renewable energy systems
65.	**BSAG-413: Production technology of fruits and Plantation crop. (Practical)**	Course Outcome: At the end of the course the student should be able to 1. Analyze the scope of cultivating a fruit or 2. Define package of practices followed for t 3. Comprehend technology involved in growi 4. Define package of practices followed for n 5. Design an orchard 6. Develop one's career interest in pomiculture and plantation crops
66	**BSAG-414: Principles of seed technology (Practical)**	Course Outcome: At the end of the course the student should be able to 1. Comprehend seed production and seed quality

		2. Demonstrate the concepts of seed certification, Seed Act and seed testing processes 3. Understand seed processing and seed storage techniques 4. State the norms of seed marketing in India. 5. Apply practical knowledge gained to commercially produce seeds and practice seed testing
67	**BSAG-415:Agricultural marketing rate and prices (Practical)**	Course Outcome: At the end of the course the student should be able to
68	**BSAG-416: Introductory Agrometerology and climate change (Practical)**	Course Outcome: At the end of the course the student should be able to 1. Appreciate the importance of weather variables in agriculture 2. Comprehend the role solar radiation in crop growth 3. Analyze various forms of precipitation 4. Interpret the role of weather hazards and climate change in crop growth 5. Understand the correlation between weather and agriculture 6. Measure weather parameters essential for crop growth
69	**BSAG-417: Protected cultivation**	Course Outcome: At the end of the course the student should be able to 1. Understand the importance of protected cultivation 2. Design and manage greenhouses for protected cultivation 3. Manage soil, nutrients and irrigation systems under protected cultivation 4. Gain knowledge on cultivation and propagation of plants in a greenhouse 5. Plan, manage and propagate crops under protected cultivation for commercial purposes

70	**BSAG-418: Protected cultivation (Practical)**	Course Outcome: At the end of the course the student should be able to 1. Understand the importance of protected cultivation 2. Design and manage greenhouses for protected cultivation 3. Manage soil, nutrients and irrigation systems under protected cultivation 4. Gain knowledge on cultivation and propagation of plants in a greenhouse 5. Plan, manage and propagate crops under protected cultivation for commercial purposes
71	**BSAG-419: Commercial plant breeding**	Course Outcome: At the end of the course the student should be able to 1. Understand the concepts of producing a male sterile, maintainer and restorer line. 2. Define hybrid seed production techniques across field crops 3. Choose plant biotechnological tools and IPR to promote crop improvement 4. State the norms involved in crop variety release and seed production 5. Practice hybridization and plant breeding
72	**BSAG-420: Commercial plant breeding (Practical)**	Course Outcome: At the end of the course the student should be able to 1. Understand the concepts of producing a male sterile, maintainer and restorer line. 2. Define hybrid seed production techniques across field crops 3. Choose plant biotechnological tools and IPR to promote crop improvement 4. State the norms involved in crop variety release and seed production 5. Practice hybridization and plant breeding
73	**BSAG-421: Agrochemicals**	Course Outcome: At the end of the course the student should be able to 1. Infer the importance of agrochemicals for

		sustainable agriculture 2. Acquire knowledge on herbicides and fungicides 3. Classify and know the role of insecticides 4. Analyze fertilizers application related to crop growth
74	**BSAG- 422: Agrochemicals (Practical)**	Course Outcome: At the end of the course the student should be able to 1. Infer the importance of agrochemicals for sustainable agriculture 2. Acquire knowledge on herbicides and fungicides 3. Classify and know the role of insecticides 4. Analyze fertilizers application related to crop growth
75	**BSAG-423: Agri - Business Management**	Course Outcome: At the end of the course the student should be able to 1. Acquire knowledge on transforming agriculture into agribusiness. 2. Comprehend the procedures of setting up of agro-based industries 3. Analyse the various activities and linkages in agri-value chain and the business environment 4. Assess the capital, financial and marketing management of agribusiness 5. Develop skills in project formulation, appraisal and evaluation 6. Do agribusiness
76	**BSAG-424: Agri-Business Management (Practical)**	Course Outcome: At the end of the course the student should be able to 1. Acquire knowledge on transforming agriculture into agribusiness. 2. Comprehend the procedures of setting up of agro-based industries 3. Analyse the various activities and linkages in agri-value chain and the business environment 4. Assess the capital, financial and marketing

		management of agribusiness 5. Develop skills in project formulation, appraisal and evaluation 6. Do agribusiness
77	**BSAG-501 :Principles of Integrated Pest and Disease Management**	Course Outcome: At the end of the course the student should be able to 1. Collect data on pest and disease attacks in a farmer's field 2. Calculate the threshold level of crop pests and diseases 3. Device crop pest and disease control measures 4. Recommend integrated pest and disease control measures 5. Diagnose, assess and practice integrated pest and disease management
78	**BSAG-502: Manures, Fertilizers and Soil Fertility Management**	Course Outcome: At the end of the course the student should be able to 1. Comprehend the utility of manures 2. Interpret the importance of varied forms of plant fertilizers 3. Interpret deficiency and toxicity symptoms of nutrients in plants 4. Describe fertility status of soil 5. Deduce fertilizer application methods based on plant and soil analysis 6. Estimate plant and soil nutrients and provide recommendations
79	**BSAG-503: Pests of crops and stored grains and their management**	Course Outcome: At the end of the course the student should be able to 1. Identify major pests of field crops and comprehend their management practices 2. Acquire knowledge on pest management in fruit crops 3. Explain the methods of pest identification and their management in vegetables 4. Demonstrate damage symptoms caused by insect pests and their management in plantation, garden, narcotic,

		spice and condiment crops 5. Comprehend grain store management 6. 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**	Course Outcome: At the end of the course the student should be able to 1. Identify and manage major diseases of cereals and millets 2. Manage diseases of pulses and oilseeds 3. Understand the management practices of major diseases affecting vegetables 4. Recognize disease symptoms of fruit crops and plan control measures 5. Comprehend the disease management practices of plantation crops 6. Recommend management practices for major diseases of agricultural and horticultural crops
81	**BSAG-505: Crop Improvement – I (Kharif)**	Course Outcome: At the end of the course the student should be able to 1. Infer the importance of plant genetic resources and utilize it in crop improvement 2. Design crop specific breeding methodology 3. Comprehend breeding methods specific to an objective 4. Describe hybrid seed production of various Kharif crops 5. Practice hybridisation and plant breeding
82	**BSAG-506: Entrepreneurship Development, Business Communication and IPR**	Course Outcome: At the end of the course the student should be able to 1. Acquire knowledge on entrepreneurship development 2. Develop organizational, managerial, problem-solving and project planning skills 3. Analyze the types of intellectual property and legislations covering IPR in India 4. Acquire knowledge on protection of plant varieties and biological diversity 5. Comprehend agri-business projects, property and diversity protections

83	**BSAG-507: Geo informatics, nanotechnology, and precision farming**	Course Outcome: At the end of the course the student should be able to 1.Define the role of remote sensing in precision agriculture 2. Demonstrate the knowledge gained on geographical information system 3. Comprehend simulation models on precision agriculture 4. Explain the role of nanotechnology in improving agriculture 5. Apply geo informatics and nanotechnology in precision farming projects
84	**BSAG-508: Intellectual property rights**	Course Outcome: At the end of the course the student should be able to 1. On completion of this unit of study, students should be able to: 2. 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 3. Work in teams, solve problems and manage time 4. Analyse ethical and professional issues which arise in the intellectual property law context 5. Write reports on project work and critical reflect on your own learning.
84	**BSAG-509: Principles of Integrated Pest and Disease Management**	Course Outcome: At the end of the course the student should be able to 1. Collect data on pest and disease attacks in a farmer's field 2. Calculate the threshold level of crop pests and diseases 3. Device crop pest and disease control measures 4. Recommend integrated pest and disease control measures

		5. Diagnose, assess and practice integrated pest and disease management
85	**BSAG- 510: Manures, Fertilizers and Soil Fertility Management (Practical)**	Course Outcome: At the end of the course the student should be able to 1. Comprehend the utility of manures 2. Interpret the importance of varied forms of plant fertilizers 3. Interpret deficiency and toxicity symptoms of nutrients in plants 4. Describe fertility status of soil 5. Deduce fertilizer application methods based on plant and soil analysis 6. Estimate plant and soil nutrients and provide recommendations
86	**BSAG-511: Pests of crops and stored grains and their management(Practical)**	Course Outcome: At the end of the course the student should be able to 7. Identify major pests of field crops and comprehend their management practices 8. Acquire knowledge on pest management in fruit crops 9. Explain the methods of pest identification and their management in vegetables 10. Demonstrate damage symptoms caused by insect pests and their management in plantation, garden, narcotic, spice and condiment crops 11. Comprehend grain store management 12. 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)**	Course Outcome: At the end of the course the student should be able to 1. Identify and manage major diseases of cereals and millets 2 Manage diseases of pulses and oilseeds 3 Understand the management practices of major diseases affecting vegetables 4 Recognize disease symptoms of fruit crops and plan control measures 5 Comprehend the disease management

		practices of plantation crops 6 Recommend management practices for major diseases of agricultural and horticultural crops
88	**BSAG-513: Crop Improvement – I (Kharif) (Practical)**	Course Outcome: At the end of the course the student should be able to 7 Infer the importance of plant genetic resources and utilize it in crop improvement 8 Design crop specific breeding methodology 9 Comprehend breeding methods specific to an objective 10 Describe hybrid seed production of various Kharif crops 11 Practice hybridisation and plant breeding
89	**BSAG-514: Entrepreneurship Development, Business Communication and IPR (Practical)**	Course Outcome: At the end of the course the student should be able to 5. Acquire knowledge on entrepreneurship development 6. Develop organizational, managerial, problem-solving and project planning skills 7. Analyze the types of intellectual property and legislations covering IPR in India 8. Acquire knowledge on protection of plant varieties and biological diversity 5. Comprehend agri-business projects, property and diversity protections
90	**BSAG-515: Geo informatics, nanotechnology, and precision farming (Practical)**	Course Outcome: At the end of the course the student should be able to 1.Define the role of remote sensing in precision agriculture 2. Demonstrate the knowledge gained on geographical information system 3. Comprehend simulation models on precision agriculture

		4. Explain the role of nanotechnology in improving agriculture 5. Apply geo informatics and nanotechnology in precision farming projects
91	**BSAG-516: Practical Crop Production-I (Kharif Crops)**	Course Outcome: At the end of the course the student should be able to 1. Plan and decide on growing a suitable kharif crop 2. Decide on the best cropping system that can be followed for a kharif season 3. Recommend package of practices for growing kharif crops 4. 4. Practice kharif crop production through integrated management 5. 5. Calculate cost benefit ratio based on cultivation and marketing expenses of a crop
92	**BSAG 517: Landscaping**	Course Outcome: At the end of the course the student should be able to 1. Understand the basic principles and importance of landscaping 2. Select and propagate plants suitable for landscaping 3. Propagate and manage pot plants 4. Contribute to improve bio-aesthetic landscaping architecture in urban and rural areas 5. Manage bonsai and lawns 6. Develop and design sustainable landscapes
93	**BSAG- 518: Landscaping (Practical)**	Course Outcome: At the end of the course the student should be able to 1. Understand the basic principles and importance of landscaping 2. Select and propagate plants suitable for landscaping 3. Propagate and manage pot plants 4. Contribute to improve bio-aesthetic landscaping architecture in urban and rural areas

		5. Manage bonsai and lawns 6. Develop and design sustainable landscapes
94	**BSAG-519: Micro propagation Technologies**	Course Outcome: At the end of the course the student should be able to 1. Understand how in vitro culture originated and appreciate its applications 2. Comprehend the various types of plant tissue culture and its importance 3. Demonstrate mass multiplication of micropropagules 4. Apply tissue culture techniques in crop improvement 5. Examine the demands of the plant tissue culture industry 6. Practice plant tissue culture techniques and become an entrepreneur 7.
95	**BSAG-520: Micro propagation Technologies (Practical)**	Course Outcome: At the end of the course the student should be able to 8. Understand how in vitro culture originated and appreciate its applications 9. Comprehend the various types of plant tissue culture and its importance 10. Demonstrate mass multiplication of micropropagules 11. Apply tissue culture techniques in crop improvement 12. Examine the demands of the plant tissue culture industry 13. Practice plant tissue culture techniques and become an entrepreneur 14.
96	**BSAG-521: Biopesticides and Biofertilizers**	Course Outcome: At the end of the course the student should be able to 1. Acquire knowledge on scope and importance of biopesticides 2. Demonstrate mass production and application technology of biopesticides

		3. Comprehend the types of biofertilizers and their characteristics features 4. Explain the mechanism and mass production of biofertilizers 5. Demonstrate the different methods of biofertilizer application 6. Mass produce biopesticides and biofertilizers
97	**BSAG-522: Biopesticides and Biofertilizers (Practical)**	Course Outcome: At the end of the course the student should be able to 1. Acquire knowledge on scope and importance of biopesticides 2. Demonstrate mass production and application technology of biopesticides 3. Comprehend the types of biofertilizers and their characteristics features 4. Explain the mechanism and mass production of biofertilizers 5. Demonstrate the different methods of biofertilizer application 6. Mass produce biopesticides and biofertilizers
98	**BSAG-523: System simulation and Agro-advisory**	Course Outcome: At the end of the course the student should be able to 1. Illustrate crop model concepts and soil-plant-atmospheric continuum 2. Summarize the importance of crop growth models to increase crop production 3. Develop yield models for different crops to predict yield 4. Comprehend weather forecasting 5. Explain about various simulation models for preparation of agro advisories 6. 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)**	**Course Outcome**: At the end of the course the student should be able to 1. Illustrate crop model concepts and soil-plant-atmospheric continuum 2. Summarize the importance of crop growth

		models to increase crop production 3. Develop yield models for different crops to predict yield 4. Comprehend weather forecasting 5. Explain about various simulation models for preparation of agro advisories 6. 6. 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**	COUT1: To give the basic knowledge of cooking to the beginners. COUT2: To make them understand about the meaning, aims, objectives, kitchen organization. COUT3: This course will give knowledge of structure, different kinds of ingredients and techniques of pre-preparation and cooking. COUT4: They will get versed with knowledge of various stocks, sauces and soups, various cuts of vegetables.
2.	**BHMCT-103 FOOD & BEVERAGE SERVICE FOUNDATION**	COUT1: To inculcate knowledge of food service principles. COUT2: To give the knowledge of functions of food and beverage services. COUT3: The course aims to provide knowledge of food and beverage procedures among trainees
3.	**BHMCT-105 FRONT OFFICE FOUNDATION**	COUT1: This course familiarizes the students with various functions of front office. COUT2: The course is aimed at familiarizing the students with various functions of to develop work ethics towards customers and satisfaction.

		COUT3: Special efforts will be made to inculcate practical skill.
4.	**BHMCT-107 ACCOMODATION OPERATIONS**	COUT1: The course familiarizes students with the organization of housekeeping, its systems and functions. COUT2: A blend of theory and practical will be used to develop sensitivity and high work ethics towards guest care and cleanliness.
5.	**BTHU103** **English**	COUT1: The objective of this course is to introduce students to the theory, fundamentals and tools of communication. COUT2: To help the students become the independent users of English language. COUT3: To develop in them vital communication skills which are integral to their personal, social and professional interactions COUT4: The syllabus shall address the issues relating to the Language of communication. COUT5: 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**	COUT1: 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. COUT2: 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 COUT3: 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. COUT4: 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**	COUT1: This course gives the basic knowledge of cooking to the beginners. COUT2: To get versed with different kinds of ingredients, techniques of pre-preparation and cooking. COUT3: 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**	COUT1: To inculcate knowledge of food service principles. COUT2: The course aims to inculcate knowledge of functions, and procedures among trainees. COUT3: The students will be well versed with menu planning and sale control system.
9.	**BHMCT – 205 FRONT OFFICE FOUNDATION**	COUT1: The course is aimed at familiarizing the students with various functions of front office COUT2: The course is aimed at familiarizing the students to develop work ethics towards customer care and satisfaction. COUT3: Special efforts will be made to inculcate practical skills.
10.	**BHMCT-207 ACCOMODATION OPERATION**	COUT1: The course familiarizes students with the organization of housekeeping, its system and functions. COUT2: 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**	COUT1: Students will enable to understand environmental problems at local and national level through literature and general awareness. COUT2: 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. COUT3: The students will apply inter-disciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate these problems. COUT4: 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**	COUT1: The students will gain day to day on-hand practical exposure in real life business activity under the supervision of industry experts. COUT2: They will also learn to co-relate theoretical knowledge with practical realities.
13.	**BHMCT401 – 18 INTRODUCTION TO INDIAN COOKERY**	COUT1: This paper will give the practical knowledge of Indian cooking to students. COUT2: They will get versed with Indian regional cuisine, basic Indian spices. COUT3: They will get versed with basic Indian gravies, traditional Indian cooking methods. COUT4: They will get versed with cooking equipment used and required for Indian cuisine and specific cooking ingredients.
14.	**BHMCT-403 – 18 FOOD AND**	COUT1: The students will be well versed with viticulture and viniculture.

	BEVERAGES ERVICE OPERATIONS	COUT2: 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**	COUT1: The course is aimed at familiarizing the students with various functions of Night Auditing & Accounting COUT2: Students will learn about the various software being used in the Hospitality Industry.
16.	**BHMCT-407 – 18 ACCOMODATION OPERATIONS**	COUT1: The students will be well versed with the supervisory responsibility, Linen handling process. COUT2: 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**	COUT1: The aim is to provide an understanding of the basic principles of accounting and their application in the hospitality industry. COUT2: 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**	COUT1: The technical skills of cold kitchen of a hotel. COUT2: To learn about Larder, Charcuterie. COUT3: To learn various kinds of cold meats.
19.	**BHMCT- 503-18 BAR OPERATIONS & MANAGEMENT**	COUT1: To inculcate knowledge of food & beverage service principles, functions, and procedures among students. COUT2: To learn the importance, planning and execution of Food and beverage outlets COUT3: Students will get the knowledge about the bar operations management.

		COUT4: To induce the knowledge of all type of alcoholic and non-alcoholic drinks.
20.	**BHMCT 505-18 FRONT OFFICE OPERATIONS & MANAGEMENT**	COUT1: This makes familiarizing the students with various functions of front office COUT2: To develop work ethics towards customer care and satisfaction. COUT3: Special efforts will be made to inculcate practical skills.
21.	**BHMCT 507-18 ACCOMMODATION OPERATIONS AND MANAGEMENT**	COUT1: The course familiarizes students with the organization of housekeeping, its systems and functions. COUT2: 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**	COUT1: This course will provide knowledge about Principles of Purchasing, Receiving, Storing and Controlling. COUT2: To learn about procedures, functions, production and sales control.
23.	**BMPD 502-18 MENTORING AND PROFESSIONAL DEVELOPMENT**	COUT1: The course familiarizes students, that how to improve the body language. COUT2: How to enhance the communications skills. COUT3: How to present them in front of others.
24.	**BHMCT 601-18 INTERNATIONAL CUISINE- AN**	COUT1: To make student in understanding the various International cuisines. COUT2: To learn about various sauces.

	EXPLORATION	COUT3: This course will make them understand about different cultures and traditions followed World Wide. COUT4: Different types of Spices & Herbs Used in International Cuisines.
25.	**BHMCT 603-18 BANQUET AND RESTAURANT OPERATIONS & MANAGEMENT**	COUT1: The course aims to inculcate knowledge of food service principles, functions, and procedures among students. COUT2: The students will learn the importance, planning and execution of Food and beverage outlets
26.	**BHMCT 605-18 FRONT OFFICE MANAGEMENT**	COUT1: To learn about various functions of front office. COUT2: To develop work ethics towards customer care and satisfaction. COUT3: Special efforts will be made to inculcate practical skills.
27.	**BHMCT 607-18 ACCOMMODATION MANAGEMENT**	COUT1: The students will get knowledge about the organization of housekeeping COUT2: Its systems and functions. COUT3: 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**	COUT1: This course will provide the basic knowledge of marketing. COUT2: The hospitality products effectively and efficiently to the clients of service industry
29.	**BHMCT-701A-18**	COUT1: This subject will give the basic knowledge of cooking to the potential students.

	FOOD PRODUCTION	COUT2: 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**	COUT1: Students will acquire knowledge on Dum cooking and Tandoor Cooking. COUT2: This course will provide knowledge about different types of marinations used in Indian section. COUT3: Methods to control the temperature of tandoor during operation.
31.	**BHMCT-701B-18 FOOD AND BEVERAGE MANAGEMENT**	COUT1: The course aims to inculcate knowledge of food service principles, functions, and procedures among students. COUT2: The students will be well versed with menu planning and sale control system.
32.	**BHMCT-703B–18 EVENT MANAGEMENT**	COUT1: Explain all the components and various roles involved in planning, organizing, running and evaluating an event. COUT2: Apply the theory and skills necessary to professionally plan, organize and run a business event. COUT3: 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**	COUT1: To learn about functions of front office and to develop work ethics towards customer care and satisfaction. COUT2: To special efforts will be made to inculcate practical skills.
34.	**BHMCT-703C-18 TOUR & TRAVEL**	COUT1: To make them understand basics of Tour & travel Management, functions, objectives.

	MANAGEMENT	COUT2: This course shall introduce students to tourism's growth and development. To appreciate the future of tourism. COUT3: This highlights the role of tourism as an economic intervention and its significance in economy. COUT4: Course discusses the global nature of tourism, Tourism product and emerging trends in tourism industry.
35.	**BHMCT 701D-18 ACCOMODATION OPEARTIONS**	COUT1: Students will get an insight about purchase and stockcontrol COUT2: Along with that students also learn about managing contractual services and crisis situation. COUT3: Students also learn aboutrenovation COUT4: Contract Cleaning concepts & ManagerialHandling
36.	**BHMCT 703D-18 INTERIOR DECORATION**	COUT1: The main objective of the course is to impart knowledge about the interior design solutions and architectural knowledge. COUT2: Identify and Evaluate the technical aspects of Interior Design. COUT3: This subject is to make students familiar with 2D and 3D geometrical figures. COUT4: To learn about Different color schemes used in different area of hotel.
37.	**BHMCT 705-PRINCIPLES OF MARKETING**	COUT1: Explain the basics of marketing, selling, marketing mix and its core concepts. COUT2: Describe the intricacies of the marketing environment and marketing information systems for effective marketing planning and strategies. COUT3: Develop necessary skills for effective market segmentation, targeting and positioning. COUT4 – Illustrate various components of product mix, product life cycle and comprehend the new product development process. COUT5– Develop an understanding of promotion mix and strategies for successful promotion

38.	**BHMCT- 706-18** **FINANCIAL MANAGEMENT**	COUT1: Apply financial data for use in decision making by applying financial theory to problems faced by business enterprises. COUT2: Apply time value of money to various pricing and money value. COUT3: Apply modern techniques in capital budgeting analysis. COUT4: Assess dividend policy's impacts on share prices
39.	**BHMCT- 707-18** **ENTREPRENEURSHIP**	COUT1: Describe the concept and theories of entrepreneurship and its role in economic development of nation. COUT2: Develop business plan and identify the reasons of failure of business plans. COUT3: Illustrate the steps in starting MSME. COUT4: Comprehend government policies and regulatory framework available in India to facilitate the process of entrepreneurial development. COUT5: 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**	COUT1: The students will gain day to day on-hand practical exposure in real life business activity under the supervision of industry experts. COUT2: They will also learn to co-relate theoretical knowledge with practical realities.

DEPARTMENT OF MASTER OF BUSINESS ADMINISTRATION

(Batch 2018 onwards)

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.

(Source: Model Curriculum for Management programs (MBA) Janauary, 2018, AICTE, New Delhi. www.aicte.india.org)

MBA101-18

FOUNDATIONS OF MANAGEMENT

Course Outcomes (COs): After completion of the course, the students shall be able to:

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.

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**	1. Students shall be able to understand the legal and regulatory framework of business environment. 2. Students shall be able to identify the fundamental legal principles behind contractual agreements. 3. Students shall be able to understand the legal provisions of sales of goods. 4. Students shall be able to understand the concept of negotiable instruments as well as rules pertaining to crossing, transferring and dishonoring of negotiable instruments. 5. Students shall have understanding of legal rules governing admission, retirement and death of partner and dissolution of partnership firm. 6. Students shall be able to understand the legal framework relating to the process of incorporation of Joint Stock Company
10.	**Marketing Management MBA 203-18**	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.	**MBA ge 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**	Understanding the need, basic guidelines, content and process for Value Education Understanding Harmony in the Human Being - Harmony in Myself. Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship Understanding Harmony in the Nature and Existence - Whole existence as Co-existence. Implications of the above Holistic Understanding of Harmony on Professional Ethics 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 Continuous Happiness and Prosperity- A look at basic Human Aspirations Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority 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 services and their importance.

	Management Of Financial Services	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.	**MBA 401-18 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**	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.

	Financial Derivatives	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**	CO1: Increase the awareness of the process and principles of performance Management / appraisal.

	Performance And Compensation Management	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.

Department of BBA (2018 Onwards)

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.

Serial 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.	**AECC BTHU103/18 English**	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 taking etc. 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. AECC
5.	**BTHU104/18 English Practical/Laboratory**	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 reading skills as well as writing skills such as report writing, note taking etc. 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.	AECC **HVPE 101-18 Human Values, De-addiction and Traffic Rules**	a. 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. b. 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. c. 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.	**AECC** **HVPE 102-18 Human Values, De-addiction and Traffic Rules (Lab/Seminar)**	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**	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 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**	1. Students will enable to understand environmental problems at local and national level through literature and general awareness. 2. The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who have done practical work on various environmental Issues. 3. The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate these problems. 4. 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 &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 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 Behaviour 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**	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 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**	The objective of mentoring will be development of: Overall Personality Aptitude (Technical and General)

	Mentoring and Professional Development	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 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**	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. 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**	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. For achieving the above, suggestive list of activities to be conducted are various Class Activities and Outdoor Activities.

Department of Bachelor of Commerce (Hons.) (Batch 2018 onwards)

Program Educational Objectives (PEOs)

PEO1: Graduates will develop expertise in the area of accounts, 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: 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.

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**	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 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 taking etc. 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**	a. 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. b. 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. c. 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.	**AECC HVPE 102-18 Human Values, De-addiction and Traffic Rules (Lab/Seminar)**	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**	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.**
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**	1. Students will enable to understand environmental problems at local and national level through literature and general awareness. 2. The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who have done practical work on various environmental Issues. 3. The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate these problems. 4. 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**	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 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**	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 □ 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 students 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**	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. 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.