GLOBAL INSTITUTE OF MANAGEMENT AND EMERGING TECHNOLOGIES, 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 CSE Department (2011 Onwards)

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	COUT1: Student should be able to define the basics of

	Elements of Mechanical Engineering	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	COUT1: Students should be able to have the knowledge of the computer registers and instructions for designing a basic computer

	Architecture	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	COUT1: Students should be able to define the essential features and elements of the C++ programming language.

	Oriented Programming using C++	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 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.
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 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
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	COUT1: Students should be able to configure local area network using IPv4 and IPV6. COUT2: Students should be able to implement wireless ad hoc

	Lab	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	COUT1: Students should be able to apply normalization to the database. COUT2: Students should be able to analyze the basic query

	Management System-II	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 Relational Database Management System-II Lab	COUT1: Students should be able to implement the concept of normalization. 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 Free/Open Source Sofwtare Lab	COUT1: Students should be able to describe the basics of Information Security 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	COUT1: Students should be able to define compelling and viable problems

	Training	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)

1.	**BTPH101-18 Mechanics of Solids**	**CO1** Understand the vector mechanics for a classical system. **CO2** Identify various types of forces in nature, frames of references, and conservation laws. **CO3** Know the simple harmonic, damped, and forced simple harmonic oscillator for a mechanical system. **CO4** Analyze the planar rigid body dynamics for a mechanical system. **CO5** Apply the knowledge obtained in this course to the related problems.
	BTPH111-18 Mechanics of Solids Lab	**CO1** Able to understand the concepts learned in the mechanics of solids. **CO2** Learning the skills needed to verify some of the concepts of theory courses. **CO3** Trained in carrying out precise measurements and handling sensitive equipment. **CO4** Able to understand the principles of error analysis and develop skills in experimental design. **CO5** Able to document a technical report which communicates scientific information in a clear and concise manner.
2	**BTPH103-18 Electromagnetism**	**CO1** Specify the constitutive relationships for fields and understand their important. **CO2** Describe the static and dynamic electric and magnetic fields for technologically important structures. **CO3** Measure the voltage induced by time varying magnetic flux. **CO4** Acquire the knowledge of Maxwell equation and electromagnetic field theory and propagation and reception of electro-magnetic wave systems. **CO5** have a solid foundation in engineering fundamentals required to solve problems and also to pursue higher studies.
	BTPH113-18 Electromagnetism Lab	**CO1** Able to verify some of the theoretical concepts learnt in the theory courses. **CO2** Trained in carrying out precise measurements and handling sensitive equipment. **CO3** understand the methods used for estimating and dealing with experimental uncertainties and systematic "errors." **CO4** Learn to draw conclusions from data and develop

		skills in experimental design. **CO5** Write a technical report which communicates scientific information in a clear and concise manner.
3	**BTPH104-18 Semiconductor Physics**	**CO1** Understand and explain the fundamental principles and properties of electronic materials and semiconductors **CO2** Understand and describe the interaction of light with semiconductors in terms of fermi golden rule. **CO3** Understand and describe the impact of solid-state device capabilities and limitations on electronic circuit performance. **CO4** Understand the design, fabrication, and characterization techniques of Engineered semiconductor materials. **CO5** Develop the basic tools with which they can study and test the newly developed devices and other semiconductor applications.
	BTPH114-18 Semiconductor Physics Lab	**CO1** Able to verify some of the theoretical concepts learnt in the theory courses. **CO2** Trained in carrying out precise measurements and handling sensitive equipment. **CO3** Introduced to the methods used for estimating and dealing with experimental uncertainties and systematic "errors." **CO4** Learn to draw conclusions from data and develop skills in experimental design. **CO5** Write a technical report which communicates scientific information in a clear and concise manner.
4	**BTPH105-18 Semiconductor and Optoelectronics Physics**	**CO1** Understand and explain the fundamental principles and properties of electronic materials and semiconductors. **CO2** Understand and describe the interaction of light with semiconductors in terms of fermi golden rule. **CO3** Understand and describe the impact of solid-state device capabilities and limitations on electronic circuit performance. **CO4** Understand the design, fabrication, characterization techniques, and measurements of Engineered semiconductor materials. **CO5** Learn the basics of the optoelectronic devices, LEDs, semiconductor lasers, and photo detectors.
	BTPH115-18 Semiconductor and	**CO1** Able to verify some of the theoretical concepts learnt in the theory courses.

	Optoelectronics Physics Lab	**CO2** Trained in carrying out precise measurements and handling sensitive equipment. **CO3** Introduced to the methods used for estimating and dealing with experimental uncertainties and systematic "errors." **CO4** Learn to draw conclusions from data and develop skills in experimental design. **CO5** Write a technical report which communicates scientific information in a clear and concise manner.
5	**BTAM101-18 Mathematics-I (Calculus & Linear Algebra)**	**CO1**The fallouts of Rolle's Theorem that is fundamental to application of analysis to Engineering problems. **CO2**To apply differential and integral calculus to evaluate definite, improper integrals and its applications. **CO3**The convergence of sequence and series and to apply different tests of convergence. **CO4** To deal with functions of several variables that are Essentialin most branches of engineering. **CO5**The essential tool of matrices and linear algebra in a comprehensive manner.
6	**BTAM201-18 Mathematics-II**	**CO1**The mathematical tools needed in evaluating multiple integrals and their usage. **CO2**The effective mathematical tools for the solutions of differential equations that model physical processes. **CO3**The tools of differentiation and integration of functions that are used in various techniques dealing engineering problems.
7	**BTAM202-18 Mathematics-II**	**CO1**understand the methods which can be used to solve a variety of ordinary and partial differential equations **CO2**demonstrate knowledge of a range of applications of analytical and numerical methods **CO3**develop their attitude towards problem solving. **CO4** Understand how to apply numerical methods to solve the Mathematical models.
8	**BTAM203-18 MATHEMATICS II**	**CO1**The effective mathematical tools for the solutions of differential equations that model physical processes. **CO2**The tools of differentiation and integration of functions of a complex variable that are used in various techniques dealing engineering problems.
9	**BTAM104-18**	

	Mathematics Paper-I (Calculus & Linear Algebra)	**CO1**To apply differential and integral calculus to notions of curvature and to improper integrals. Apart from various applications, they will have a basic understanding of Beta and Gamma functions. **CO2**The essential tools of matrices and linear algebra including. linear transformations, eigenvalues, diagonalization and orthogonalization
10	**BTA204-18 Mathematics Paper-II (Probability & Statistics)**	**CO1**The ideas of probability and random variables and various discrete and continuous probability distributions and their properties. The basic ideas of statistics including measuresof central tendency, correlation and regression and the statistical methods of studying data samples
11	**BTAM202-18 Mathematics-II (Differential Equations & Numerical Methods)**	**CO1**understand the methods which can be used to solve a Variety of ordinary and partial differential equations. **CO2**demonstrate knowledge of a range of applications of analytical and numerical methods **CO3** Develop their attitude towards problem solving. **CO4**Understand how to apply numerical methods to solve the Mathematical models.
12	**BTEE-101-18 Basic Electrical Engineering**	**CO1** Have the knowledge of DC circuits, AC Circuits, basic magnetic circuits, working principles of electrical machines, and components of low voltage electrical installations **CO2** Be able to analyze of DC circuits, AC Circuits **CO3** Understand the basic magnetic circuits and apply it to the working of electrical machines **CO4** Be introduced to types of wiring, batteries, and LT switchgear.
13	**BTEE-102-18 Basic Electrical Engineering Laboratory**	**CO 1** The ability to use common electrical measuring instruments and understand the fundamentals of electrical engineering. **CO 2** The ability to make electrical connections, and measure power, power factor using appropriate equipments. **CO 3** Have the knowledge of electrical machines, components and their ratings. **CO 4** Understand the operation of transformers and electrical machines.
14	**BTME101-18**	**CO1** To prepare you to design a system, component, or

	Engineering Graphics & Design	Processto meet desired needs within realistic constraints such aseconomic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability **CO2**to prepare you to communicate effectively **CO3**to prepare you to use the techniques, skills, and modern engineering tools necessary for engineering practice.
15	**BTCH101-18 Chemistry-I**	**CO1**Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces. **CO2**Rationalise bulk properties and processes using thermodynamic considerations. **CO3**Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques. **CO4** Rationalise periodic properties such as ionization potential, electronegativity, oxidation states and electronegativity.
16	**BTCH102-18 Chemistry-I Lab.**	**CO1**Estimate rate constants of reactions from concentration of reactants/products as a function of time **CO2**Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc **CO3**Synthesize a small drug molecule and analyse a salt sample
17	BTPS101-18 **Programming for Problem Solving**	**CO1**To formulate simple algorithms for arithmetic and logical problems. **CO2**To translate the algorithms to programs (in C language). **CO3**To test and execute the programs and correct syntax and logical errors. **CO4**To implement conditional branching, iteration and recursion. **CO5**To decompose a problem into functions and synthesize a complete program using divide and conquer approach. **CO6**To use arrays, pointers and structures to formulate algorithms and programs. **CO7**To apply programming to solve matrix addition and multiplication problems and searching and sorting problems. **CO8**To apply programming to solve simple numerical method

		problems, namely rot finding of function, differentiation of function and simple integration.
18	BTPS102-18 **Programming for Problem Solving** Lab	**CO1**To formulate the algorithms for simple problems **CO2**To translate given algorithms to a working and correct program **CO3**To be able to correct syntax errors as reported by the compilers **CO4**To be able to identify and correct logical errors encountered at run time **CO5**To be able to write iterative as well as recursive programs **CO6**To be able to represent data in arrays, strings and structures and manipulate them through a program **CO7**To be able to declare pointers of different types and use them in defining self referential structures. To be able to create, read and write to and from simple text files.
19	BTMP101-18 Workshop/Manufacturing Practices	the students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.
20	**BTHU-101-18 English**	**CO1**The objective of the course is to help the students become the independent users of English language. **CO2**Students will acquire basic proficiency in reading & listening, comprehension, writing and speaking skills. **CO3**Students will be able to understand spoken and written English language, particularly the language of their chosen technical field. **CO4**They will be able to converse fluently. **CO5**They will be able to produce on their own clear and coherent texts.
	BTHU-102-18 English Laboratory	**CO1**The objective of the course is to help the students become the independent users of English language. **CO2**Students will acquire basic proficiency in listening and speaking skills. **CO3** Students will be able to understand spoken English language, particularly the language of their chosen technical

		field. **CO4**They will be able to converse fluently **CO5**They will be able to produce on their own clear and coherent texts.

DEPARTMENT OF MECHANICAL ENGINEERING

Program Outcome

Students will have

- 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, 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

PSO – 1:

Apply all fundamental principles of core subjects of Mechanical in every aspect of day to day life.

PSO – 2:

Use the Machine design and manufacturing concepts for developing machines and products.

PSO – 3:

Use heat transfer and refrigeration concepts to make an efficient system for society.

Course Outcomes of ME Department

1	BTPH-101 Engineering Physics	1. Students will be able to understand the various concepts of Engineering Physics effectively and will be able to solve the engineering problems. 2. Students will be able to interpret EM wave theory and magnetic materials. 3. Students will be able to analyse dispersion effects of fibre optics. 4. Student will be able to apply the concept of EM waves in waveguides and antennas. 5. Students can design a laser useful in engineering field.
	BTPH-102 Engineering Physics Laboratory	1. Students will be able to understand the various concepts of Engineering Physics effectively and will be able to understand various characteristics of laser beam. 2. Students will be able to interpret magnetic materials and dispersion effects of fibre optics. 3. Students will be able to analyze polarization of dielectric material. 4. Students will able to apply concept of refractive index of a material. 5. Students can design a laser useful in engineering field.
2	BTAM-101 Engineering Mathematics-1	1. Students should be able to define partial derivative functions. 2. Students can explain vector calculus techniques and different solenoidal and irrotational vector point functions. 3. Students can apply integration techniques to calculate area and volume of any solid. 4. Students will be able to apply Gauss Divergence, Green's and Stoke's theorem to open and closed surfaces. 5. Students should be able to evaluate multiple integral functions.

3	BTHU-101 Communicative English	1. Students should be able to speak in English in real life situation. 2. Students should inculcate reading habits and gain effective reading skills. 3. Students should learn more on active and passive vocabulary. 4. Students should develop listening skills for academic and professional purpose. 5. Students should be able to comprehend scientific and technical English. 6. Students should develop writing skills to prepare CVs, letters and reports in formal and business situation. 7. Students should be able to analyze and interpret engineering problems expressed in English.
	BTHU-102 Communicative English Laboratory	1. Students should be able to speak in English in real life situations. 2. Students should develop listening skills for academic and professional purpose. 3. Students should be able to comprehend scientific and technical English. 4. Students should be able to analyze and interpret engineering problems expressed in English.

4	BTEE-101 Basic Electrical and Electronics Engineering	1. Students should be able to analyze DC and AC circuits. 2. Students should be able to explain the magnetic circuits and working of transformer, electrical machines etc. 3. Students should be able to analyze RL, RC and RLC circuits for ac and dc. 4. Students should be able to discuss semiconductors and transducer 5. Students should be able to solve basic digital electronics problem
	BTEE-102 Basic Electrical and Electronics Engineering Laboratory	1. Students will be able define the fundamentals of DC and AC circuits with Ohm's law and Kirchhoff's laws. 2. Students will be able to interpret the various measuring equipments such as multimeter and LVDT. 3. Students can analyze the power factor of RL circuit and resonance of series and parallel RLC circuit. 4. Students can design and verify the various logic gates and rectifiers. 5. Students can apply the Kirchhoff's law and others in solving electrical circuits. 6. Students can evaluate the characteristics of Transistors, CE and CB configuration and PN junction diode.

5	HVPE-101 Human Values and Professional Ethics	1. Students are able to discriminate between valuable and superficial in life. 2. Students develop the critical ability to distinguish between essence and form. 3. Students can describe sensitivity and awareness leading to commitment and courage to act on their own belief. 4. Students become aware of Self exploration- to know what we are and what we really want to be. 5. Students are aware regarding the importance of Sanyama and Swasthya in life. 6. Students will come to know the ways to achieve harmony in self, family, society and nature. 7. Students can summarize the importance of professional ethics in different walks of life especially for engineers.

6	BTCH-101 Engineering Chemistry	1. Students should be able to describe various techniques of spectroscopy and its applications. 2. Students should be able to classify the law of photochemistry and various applications like semiconductor photochemistry including photovoltaic cell and optical sensors. 3. Students should be able to discuss different problems related to boilers in industry and are able to suggest solutions for the same. 4. Students should be able to analyze the green chemistry to make the industrial and engineering processes environment friendly. 5. Students should be able to generalize various conversion processes for production. 6. Students should be able to memorize the mechanism of corrosion and prevention methods. 7. Students should be able to categorize the basics of fuel like natural gas, liquid and crude oil. 8. Students should be able to define nanochemistry and its future perspective.
	BTCH-102 Engineering Chemistry Laboratory	1. Students should gain an appreciation of the scientific discipline of chemistry and the principles used by chemists to solve complex problems. 2. Students should be able to identify different problems and will be able to suggest possible solutions for the same in industry. 3. Students should be able to analyze the importance of modern chemistry for technical improvements. 4. Students should be able to apply the various practical skills to solve the technical problems.

7	BTME-101 Elements of Mechanical Engineering	1. Students will be able to define the basics of thermodynamics, types of engineering materials, centre of gravity and moment of inertia. 2. Students will be able to understand the basic operation of devices based on flow processes. i.e. turbines, compressor, heat/IC engines etc. 3. Students will be able to solve the problems related to basics of thermodynamics, centroid, centre of gravity and moment of inertia. 4. Students will be able to compare the working of 2 stroke and 4 stroke engines.
8	BTME-102 Engineering Drawing	1. Students will be able to state about drawing equipment and use of instruments, symbols and conventions in drawing Practice. Types of lines & BIS codes. Dimensioning. 2. Students will be able to describe Concepts & types of lettering. 3. Students will be able to construct plain & diagonal scales. 4. Students will be able to solve the problems of Projection of points, projection lines, projection of planes and projection solids. 5. Students will be able to draw & develop Section of solids, intersection and development of surfaces. 6. Students will be able to draw and judge Isometric projection, orthographic projection and missing lines of simple solid blocks.
9	BTMP-101 Manufacturing Practice	1. Students will describe actual working of various types of tools & equipments used in workshops as well as gain knowledge of design. 2. Students will be identify and select the appropriate tools required to perform marking

		out tasks also recognize how to work as an individual as well as a team. 3. Students will be able to operate different processes welding, machining etc. 4. Students will be able to analyze different safety measures required while working. 5. Students will design different jobs in workshops. 6. Students will evaluate different failures in job,after job is made.
10	BTCS-101 Fundamentals of Computer Programming and IT	1. Students will have sufficient knowledge of basic computer operations. 2. Students will be able to use Microsoft word and can use it productivity and for their personal use. 3. Students will be able to work with spreadsheets, reports, generation and perform calculations by using Microsoft excel. 4. Students will be able to prepare presentations, slide shows by using Microsoft Power Point features. 5. Students will have sufficient knowledge of program planning and problem solving tools like algorithm, pseudo-code and flowcharts. 6. Students will have knowledge of basic C++ features. 7. Students will be able to make program to implement basic concepts by using C++ programming language.
	BTCS-102 Fundamentals of Computer Programming and IT Laboratory	1. Students should be able to understand the basics of computers and technology. 2. Students should be able to work with MS Office. 3. Students should be able to design and develop basic programs in C language. 4. Students should be able to apply operations on

		range of cells using built in formulae. 5. Students should be able to create email account, sending mails, receiving mails, sending files a attachments, etc.
11	BTME-103 Computer Graphics Lab	1. Students will be able to define points, line, plane and solids. 2. Students will be able to understand the orthographic and isometric view of various objects. 3. Students will be able to analyze the Sectional view of solids. 4. Students will be able to draw the various mechanical components. 5. Students will be able to evaluate the two and three dimensional views of object.

12	EVSC-101 Environmental Science	1. Students get deep knowledge of components of environment and multidisciplinary nature of the students get deep knowledge of components of environment and multidisciplinary nature of the subject. 2. Students get awareness regarding importance, types and conservation of natural resources. 3. Students get an overview of structure and function of ecosystem as well as the deep knowledge of biodiversity, its importance for mankind and conservation techniques. 4. Students are able to understand the types and causes of pollution, solid waste management, nuclear waste and e waste and how to deal with natural disasters. 5. Students 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. 6. Students get aware of population related problems in India and various programmes launched by Indian government related to population and environment protection.

13	BTAM-102 Engineering Mathematics-2	1. Students should be able to define linear ordinary differential equations to electric R-L-C circuits, Deflection of beams, Simple harmonic motion, and Simple population model. 2. Students should be able to describe the basic concepts of linear algebra. 3. Students should be able to compare and analyze different tests of convergence. 4. Students should be able to evaluate the elementary functions of complex variables and distinguish between their real and imaginary parts.
14	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.
15	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.

16	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.
17	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.
18	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.

19	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.

20	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.
21	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.

22	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.
23	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.
24	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.

25	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
26	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.

27	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.

28	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.

29	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.

30	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.
31	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.

32	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.
33	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.

34	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.
35	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 Fluid Machinery Lab.	1. Students will be able to analyze the working of the hydraulic ram. 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.
36	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.
37	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.
38	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.

39	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.
40	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.
41	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.
42	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.
43	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.
44	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.
45	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.

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

Serial No.	Course Code and Name	Course outcomes
15	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.
16	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.
17	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.
18	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.
19	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. .
20	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.

21	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.

22	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 coefficient 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.

23	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.
24	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.
25	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.
26	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.

27	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.
28	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.

29	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.

30	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.

31	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.
32	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.
33	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.
34	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.
35	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.

36	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.
37	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.
38	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.

39	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.
40	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.
41	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.

42	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.
43	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.

44	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.

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

46.	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.
47.	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.
48.	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.
49.	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.
	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.
50.	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.
51.	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.
52.	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.
53.	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.
54.	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.
55.	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.
56.	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.
	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
57.	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.

58.	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
59.	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.
60.	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.
61.	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.

62.	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.
63.	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;
64.	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.
65.	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
66.	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.
67.	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.
68.	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
69.	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 Applications Lab	COUT1: Students should be able to Understand different testing involved with enterprise application and the process of rolling out an enterprise application. 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.
70.	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
71.	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
72.	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.
73.	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
74.	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
75.	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

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

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 Technology 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.
	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.

DEPARTMENT OF MASTER OF BUSINESS ADMINISTRATION

Program Outcome

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

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

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

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

Course Outcomes of MBA Department

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.

Program Specific Outcome:

1. Developing the skills and knowledge about functioning of local and global business environment and society.
2. To analyse the business data, application of relevant analysis and problem solving in other functional areas such as marketing, business strategy ,finance and human resources.
3. To imbibe the students with requisite domain knowledge, skills & right attitude necessary to provide effective leadership in a global environment.
4. To harness the various aspects of the global business and Cross Cultural Understanding

MBA101 Principles & Practices of Management

Objective: This course presents a thorough and systematic coverage of management theory and practice. The course aims at providing fundamental knowledge and exposure of the concepts, theories and practices in the field of management. It focuses on the basic roles, skills and functions of management, with special attention to managerial responsibility for effective and efficient achievement of goals.

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.

MBA102 Organisational Behaviour

Objectives: The course aims to provide an understanding of basic concepts, theories and techniques in the field of human behaviour at the individual, group and organizational levels in the changing global scenario. The course must be taught using case study method.

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

CO1- To explain the basics of Orgnaizational 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 organisational culture.
CO5: To analyse the process of conflict management and approaches to stress management.

MBA-103 Accounting for Management

Objective: The objective of this course is to acquaint the students regarding various accounting concepts and its application in managerial decision making. The course attempts to build potential to use appropriate accounting tools and techniques of financial accounting and management accounting for preparing and analyzing financial statements.

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

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 analyse financial statements using various tools for financial analyse and interpret the financial position of a business organization.
CO5 – To familiarize the students about the contemporary developments in the accounting.

MBA-104 Quantitative Techniques

Objective: The objective of this paper is to acquaint the students with various statistical tools and techniques used to business decision making. . The course aims at providing fundamental knowledge and exposure to the students to use various statistical methods in order to understand, analyze and interpret data for decision making.

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

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.
CO 5: To have a understanding of Hypothesis and various test.

MBA 105 Managerial Economics

Objective: This course is intended to make students understand various social, political, legal and economic and other factors that influence business in India so as to enable them appreciate associated opportunities, risks and challenges and their relevance for managerial decisions.

Course Outcomes: After completing this course,, students shall be able to:
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 companyand 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.

MBA106 Business Communication

Objective: This course is designed to give students a comprehensive view of communication, its scope and importance in business, the role of communication in establishing a favourable image of the organization. The aim is to develop students' ability to communicate correctly and effectively on matters having relevance to day-to-day business operations. This course will make student conversant with fundamentals of communication, help them honing oral, written and non-verbal communication skills and to transform their communication abilities

Course Outcomes: At the end of the course, the student will be able to:
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.

MBA 107 Information Technology for Management

Objective: The primary objective of this course is to familiarize the student with basic concepts of information technology and their applications to business processes. Through this course it is intended to familiarize the students with the computer hardware and software applications for data/file management.

Course Outcomes: After completing the course, the students shall be able to:
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.

MBA 201 Business Environment

Objectives: To provide students with an understanding of basic economic principles of production & exchange-essential tools in making business decisions in today's global economy. The objective is to make the student understanding how the economy works, covering microeconomic description of business applications, including pricing for profit maximization, price elasticity, market structures and modeling of business in varying economic climates.

Course Outcomes: At the end of the course, student should be able to
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.

MBA 202 Productions & Operations Management

Objective: It is a subject where a student learns various steps of product design, development, production, plant location, storage, production planning and control. The students are motivated to apply concepts and principles of management to become more effective professional.

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

MBA-203 Human Resource Management

Objectives: The objective of the paper is to make student aware of the various functions and importance of the HR department in any organization. It is basically concerned with managing the human resources, whereby the underlying objective is to attract retain and motivate the human resources in any organization, which is the most challenging and daunting look for any organization today.

Course Outcomes: At the end of the course, the student will be able to:
CO1- To explain the basics of Human Resource Management and analyse 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 analyse 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.

MBA 204Marketing Management

Objectives: The course aims at making students understand concepts, philosophies, processes and techniques of managing the marketing operations of a firm in turbulent business environment. This course will provide better understanding of the complexities associated with

marketing functions, strategies and provides students with the opportunity to apply the key concepts to practical business situations.

Course Outcomes: At the end of the course, the student will be able to:
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.

MBA 205 Financial Management

Objectives: To provide an understanding of the function, the roles, the goals and the processes of corporate financial management, covering the sourcing of finances and their issues in investment and operations. Problem-solving methodology will be used to illustrate the theories and tools in financial decision making.

Course Outcomes: At the end of the course, the student will be able to:

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 analyse 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.

MBA206 Research Methodology

Objectives: The course aims at equipping students with an understanding of the research process, tools and techniques in order to facilitate managerial decision making.

Course Outcomes (COs): After completion of the course, the students shall be able to:
CO1: Explain the objectives and process of conducting research and its application in business.
CO2: Analyse 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: Understand the use of SPSS software.

CO 6: To have a understanding of Hypothesis and various test.

HVPE 101 Human Values & Professional Ethics

Course Outcomes: This course is intended to provide a much needed orientational input in Value Education to the young enquiring minds.
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.

Applied Operation Research (MBA 301)

Objective: objective of the syllabus is to acquaint the students with the knowledge of various tools and techniques which helps in optimal utilization the scarce resources of an organization.

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 queuing problems.

Corporate Legal Environment (MBA 302)

Objective: The objective of this paper is to acquaint the students with the corporate legal framework prevalent in the country.

Course Outcomes: Following are the expected outcomes of the course:
CO1. Students shall be able to understand the legal and regulatory framework of business environment.
CO2. Students shall be able to identify the fundamental legal principles behind contractual agreements.
CO3. Students shall be able to understand the legal provisions of sales of goods.

CO4. Students shall be able to understand the concept of negotiable instruments as well as rules pertaining to crossing, transferring and dishonouring of negotiable instruments.

CO5. Students shall have understanding of legal rules governing admission, retirement and death of partner and dissolution of partnership firm.

CO6. Students shall be able to understand the legal framework relating to the process of incorporation of Joint Stock Company .

CONUMER BEHAVIOUR (MBA 901)

Objective: The objective of this course is to help students understanding the various factors effecting consumer behavior and to understand the process of consumer buying. Based on the understanding of Consumer behavior, the students are expected to design the strategy.

Course Outcomes: Upon completion of this course, students will be able to:
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.

Advertising Management (MBA 902)

Objective: The objective of this course is to develop the understanding about the marketing communication tools and implement them in designing Advertisement strategies.

Course Outcomes: After completion of the course, the students shall be able to:
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: Understand the concept of Measuring Advertising Effectiveness and Advertising agencies.

Security Analysis and Portfolio Management (MBA 921)
Objectives: To acquaint the students with the working of security market and principles of security analysis; and to develop the skills required for portfolio management so as to be able to judge the competitive position of firm in capital market to support investment decisions.

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.

MANAGEMENT OF FINANCIAL SERVICES (MB 922)
Objectives: The objective of this paper is to acquaint the students with emerging trends in financial services.
Course Outcomes: Upon completion of this course, students will be able to:
CO1: To understand the concept of financial services and their importance.
CO2: To know the structure and schemes of mutual funds.
CO3: To understand the importance and process of Dematerialisation and rematerialisation.
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 securitisation.
CO6: To understand the concept of plastic money.

Social Security & Labour Welfare (MBA 961)
Objective: To acquaint the students with basic Acts pertaining to social security and labour welfare as applicable in India.
Course Outcomes (COs): After completion of the course, the students shall be able to:
CO1: Describe fundamental concepts and scope of social security.
CO2: To understand the nature and role of trade unions for workers and industries.
CO3: To study the implications of Employment State Insurance Act,1948, Provident Fund & Miscellaneous Provision Act,1951, Gratuity Act,1972.
CO4: To understand the scope of labour welfare.
CO5: To apply various industrial legislations in business.

Training & Development (MB-962)

Objective: To create understanding among students for need, importance and implementation of training so as to achieve employee development.

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

Programming in C (MBA 981)

Objective: The objective of the C programming language is to make user familiar with the programming approach. The C programming offers a new powerful way to cope with the complexity of a program. We can familiarize our self with the development environment.

Course Outcomes (COs): After completion of the course, the students shall be able to:
CO1 Understand the concepts of programming Coding and Execution.
CO2 Develop understanding about control statements and different fuctions.
CO2 Able to assess Pointer expressions and different types of Arrays.
CO3 Develop understanding of opening and closing of files.

Relational Database Management System (MBA 982)

Objective: The course has been designed to provide an introduction of Database Management Systems. The student will be introduced to various fundamental concepts of Database Management Systems including various models, database design and languages. Overview of DBMS, Relational Database Management System, Object Based Data Bases

Course Outcomes (COs): After completion of the course, the students shall be able to:
CO1: Describe fundamental concepts and components of DBMS.
CO2: To understand the different type of Model.
CO3: To study the concept of Concurrency, Recovery, Integrity and types of database Security.
CO4: To develop understanding of Oracle data types.

Strategic Management (MBA 401)
Objective: This course helps students to combine strategic and managerial approach towards various decisions of management.
Course Outcomes: After studying this course, the students should be able to:
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 organisational systems and techniques of strategic evaluation and control.

Entrepreneurship and Managing Small Medium Business (MBA 402)
Objective: The purpose of this paper is to prepare a ground where the students view Entrepreneurship as a desirable and feasible career option. In particular the paper seeks to build the necessary competencies and motivation for a career in Entrepreneurship.

Course Outcomes: After completing the course, the students shall be able to:
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 analyse different phases of project management viz. generation and screening of project ideas, project analysis, selection, financing, implantation and review.

SERVICES MARKETING (MBA-906)
Objectives: This course aims at creating understanding among the students to apply service marketing concepts and strategies to the create customer value in today's highly competitive environment.
Course Outcomes: Upon completion of this course, students will be able to:
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.

INTERNATIONAL MARKETING (MBA 907)
Objectives: The course aims at acquainting students with the concepts and procedures for international marketing and trains them to develop and implement plans and strategies for entering international markets and managing overseas operations.

Course Outcomes: Upon completion of this course, students will be able to:
CO1: Understand the fundamental concepts of International Marketing.
CO2: Identify the role and significance of International marketing environment.
CO3: Examine the import and export policy.
CO4: Analyze International distribution policy and international distribution channels.
CO5: Examine various International Trade barriers.

International Finance (MBA 926)

Objective: The objective of this paper is to help students to understand finance in global settings.

Course Outcomes: After studying this course, the students should be able to:
CO1: Understand the framework of international exchange rate system including factors influencing exchange rates.
CO2: Discuss the basics of different types of derivative contracts like futures, options and swaps.
CO3: Understand various types of risks / exposures in forex trading and their management.
CO4: Describe various theories underlying the concepts of international finance.
CO5: Understand International Sources of finance.

Banking & Insurance Operations (MB 927)

Objective: The purpose of this paper is to make students understand the applications of banking and insurance operations in the business.

CO1: Understand the concepts of banking system in India.
CO2: Discuss various new concepts of banking such as Debit, Credit, and Smart cards, EFD, RTGS.
CO3: Explain types of loans, and understand the concept of Overdraft facilities
CO4: Understand the concept of Insurance and various provisions of Insurance Act,1938.
CO5: Understand the framework of Bancassurance.

Organizational Development (MB-966)

Objective: The objective of this course is to make students understand interventions processes in the organization
Course Outcomes: Upon completion of this course, students will be able to:
CO1:Develop understanding of organization development and Define, explain and illustrate theories of planned change, their relevant foundations, strengths and weaknesses.
CO2:To Understand concepts related to system theory, Action Research and Models,
CO3:Understand the role of various intervention strategies in organizational development.
C04:: Examine various issues in the relationship between client and consultant relationship.

INTERNATIONAL HUMAN RESOURCE MANAGEMENT (MB-967)

Objective: The aim is to make student understand HR Policies in Global settings

Course Outcomes: Upon completion of this course, students will be able to:

CO1:Develop understanding of Cross cultural management .
CO2:To Understand various models of comparing culture.
CO3:Understand the role of cross cultural communication.
CO4: Understand the concept of Cross –cultural Negotiation and cross –cultural ethics.

Programming in C++ (MBA 986)

Objective: The objective of this course to learn programming from real world examples and understanding object oriented approach for finding solutions to various problems with the help of C++ language. Students will learn to create computer based solutions to various real-world problems using C++ and will learn various concepts of object oriented approach towards problem solving.

Course Outcomes: Upon completion of this course, students will be able to:
CO1: Understand the fundamental concepts of Object Oriented Programming and C++.
CO2: Identify the types of functions , Arrays and Pointers.
CO3: Examine the functions of Polymorphism and Rules for operator overloading.

E-Commerce and Cyber Securities (MBA 987)

Objective The overall objective of this subject is to familiarize the students with internet, online system and html tags. A brief description of how web pages are made and knowledge of ASP.Net

Course Outcomes: After completion of the course, the students shall be able to:
CO1: Understand the concept of E-Commerce.and Internet Protocols.
CO2: Know the Security Issues in e-business and Cyber-laws.
CO3: Describe the Java Script, HTML and creation of HTML web pages.
CO4: Know about ASP.Net and Web Services.

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 MCA Department

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: StudentsshouldbeabletoapplyManagementInformation 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 Accounting & Financial Management	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.
5.	MCA105 Technical	COUT1: Students should be able to speak in English, in real life situation.

	Communication& Professional Ethics	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. COUT5: 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. 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.
8.	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.
9.	MCA 201	COUT1: Knowledge of Sets, Relations and their properties with

	Mathematical Foundations of Computer Science	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.
10.	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.
11.	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.
12.	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.
13.	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.
14.	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.
15.	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.
16.	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
17.	MCA 301 Database Administration	COUT1: Students should be able to define database administrator's roles and responsibilities and also able to install and upgrade database packages. 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.
18.	MCA 302 Computer Based Optimization Techniques	COUT1:Students should be able to recognize the importance and value of Operations Research and mathematical modeling in solving practical problems in industry COUT2:Students should be able to formulate a managerial decision problem into a mathematical model COUT3:Students should be able to understand Operations Research models and apply them to real-life problems COUT4:Students should be able to use computer tools to solve a mathematical model for a practical problem.

19.	MCA 303 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.
20.	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.
21.	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
22.	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.
23.	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.
24.	MCA 401 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.
25.	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
26.	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.
27.	MCA 404	COUT1:Discuss the evaluation of operating systems.

	Advanced 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
28.	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.
29.	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.
30.	MCA 407 Software Lab X (Advanced Operating Systems)	COUT1:Students should be able to understand the concepts of MOSIX operating system along with its system requirements. COUT2: Students should be able to understand and describe the functioning of various LINUX commands and MOSIX commands such as mosrun, mosmon, mosps, etc.
31.	MCA 501 Embedded Systems	COUT1:Students will be able to understand what is embedded systems and the embedded system design process COUT2:Students will be able to interpret the different COUT3:Component of Embedded systems /PIC COUT4: Students will able to interpret addressing modes and instructions used. COUT5:Students will able to Understand the Different application of PIC COUT6:Students will be able to evaluate the designing of PIC
32.	MCA 502 Network Security &Administration	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 analysing, designing, implementing and validating solutions to computer network security challenges using common network security tools and formal methods.
33.	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.
34.	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.
35.	MCA 505 Hardware Lab – I (Embedded Systems)	COUT1:Understand basic concepts in the embedded computing systems area; COUT2:Determine the optimal composition and characteristics of an embedded system; COUT3:Design and program an embedded system at the basic level
36.	MCA 506 Software Lab –XI (Web	COUT4: Students should be able to design dynamic and creative webpages using XHTML. COUT5: Students should be able to design webpages using

	Technologies	technologies like JavaScript, CSS, HTML, and AJAX. COUT6:Students should have clear understanding of hierarchy of objects in HTML and XML. COUT7:Students should have knowledge about internet related technologies and Web Services.
37.	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.
38.	MCA601 Industrial Training	The 6 Months industrial training enables students to get an exposure to industrial standards. Students will be able to handle the online project development in various platform.

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
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4.	MCA 104 Accounting & Financial Management	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.
5.	MCA105 Technical	COUT1: Students should be able to speak in English, in real life situation.

	Communication	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	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

	System)	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 Database Administration	COUT1: Students should be able to define database administrator's roles and responsibilities and also able to install and upgrade database packages. 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 Mobile Application Development	CO1: Students will be able to do work on Android OS. CO2: Students will be able to create different type of Android based applications. CO3: Students will be able to discuss various security issues in Android platform. CO4: Students will be able to implement various database applications and content providers. CO5: Students will be able to differentiate among various types of operating systems.
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	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

	Application Development)	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 & Quality Management	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: 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.