DEPATMENT OF INFORMATION TECHNOLOGY (PEOs, POs, PSOs, COs)

Program Educational Objectives

PEO1: To empower students with substantial knowledge in mathematics, scientific and primitive engineering concepts required to solve computing problems and pursue higher studies.

PEO2: To equip students with profound knowledge about the vital information technology and allied engineering concepts to deal with industry oriented problems and develop novel products.

PEO3: To inculcate professional-social ethics, team work in students and acquaint them with requisite technical and managerial skills to attain a successful career.

Program Outcomes

After the successful completion of undergraduate course IT Engineering, Graduates will be able to:

PO1. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.

PO2. Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

PO4. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling to complex engineering activities, with an understanding of the limitations.

PO6. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes

Students will be able to :

PSO1 Apply standard practices for software project development using hands-on programming skills for analysis, design and creation of software solutions.PSO2 Design networks and also aware of network security related issuesPSO3 Create and maintain database for providing back-end support to IT applications

COURSE OUTCOMES

Data Structure & Algorithms BTIT301-18

1. Understand the concept of Dynamic memory management, data types, algorithms, Big O notation.

2. Understand basic data structures such as arrays, linked lists, stacks and queues.

3. Describe the hash function and concepts of collision and its resolution methods

4. Solve problem involving graphs, trees and heaps

5. Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data

Object Oriented Programming

BTIT302-18

The student will be able to:

1. Identify classes, objects, members of a class and the relationships among them needed to solve a specific problem.

2. Demonstrate the concept of constructors and destructors. And create new definitions for some of the operators.

3. Create function templates, overload function templates.

4. Understand and demonstrate the concept of data encapsulation, inheritance, polymorphism with virtual functions; &

5. Demonstrate the concept of file operations, streams in C++ and various I/O manipulators.

Computer Architecture

BTES301-18

- 1. To understand block diagram of microprocessor.
- 2. Apply instruction set for writing assembly language programs.
- 3. Design a memory module and analyze its operation by interfacing with CPU.
- 4. Classify hardwired and micro programmed control units.

Understand the concept of pipelining and its performance metrices.

Mathematics-III

BTAM304-18

- 1. Understand the functions of several variables that are essential for most branches of engineering.
- 2. Apply multiple integrals to deal with areas and volumes of various structures which are quite significant in real world.

 Formulate and solve engineering problems related to convergence infinite series and Taylor series.

Develop knowledge to solve higher order differential equations

Digital ElectronicsBTES301-18

1.Demonstrate the operation of simple digital gates, identify the symbols, develop the truth table

2. Demonstrate the operation of a flip-flop. Design counters and clear the concept of shift v

3. Setup different types of memories and their applications. Convert digital signal into analog and

Data Structures Lab (BTCS306)

- 1. Implement basic data structures such as arrays and linked list.
- 2. Programs to demonstrate fundamental algorithmic problems including Tree Traversals, Graph traversals, and shortest paths.
- 3. Implement various searching and sorting algorithms.

Programs to demonstrate the implementation of various operations on stack and queue.

Digital Electronics Lab

BTES302-18

At the end of this course student will demonstrate the ability to:

- 1. Realize combinational circuits using logic gates.
- 2. Realize sequential circuits using logic gates.
- 3. Realize various flip flops and counters.

Object Oriented Programming LabBTIT304-18

- 1. Develop solutions for a range of problems using objects and classes.
- 2. Programs to demonstrate the implementation of constructors, destructors and operator overloading.
- 3. Apply fundamental algorithmic problems including type casting, inheritance, and polymorphism.
- 4. Understand generic programming, templates, file handling.

Operating Systems (BTCS401)

- 1. Identify the functions, structure and design issues associated with operating systems.
- 2. Familiarize with different concepts of process management like inter-process communication, semaphore, message passing, classical IPC problems, CPU scheduling, deadlock detection and prevention.
- **3.** Understand and analyze the theory and implementation of physical and virtual memory, memory management policies, I/O system and secondary storage structure.
- 4. Implement the different CPU scheduling, page replacement and device algorithms in C++.
- 5. Install the various types of operating systems including UNIX, Windows.
- 6. Contrast and compare the various file systems and their corresponding protection and security mechanisms.

Discrete Structures (BTCS402)

- 1. Perform operations on various discrete structures such as sets, functions, relations, and sequences.
- 2. Ability to solve problems using Counting techniques, Permutation and Combination, Recursion and generating functions.
- 3. Apply algorithms and use of graphs and trees as tools to visualize and simplify Problems.
- 4. Apply algorithms and use of graphs and trees as tools to visualize and simplify Problems.
- 5. Use of K-Maps and Truth Tables to construct and verify correctness of a Boolean expression.
- 6. Understand the various properties of algebraic systems

Computer Networks (BTIT 401-18)

- 1. Understand the basic concepts of data communication and transmission.
- **2.** Knowledge of computer networks, various topologies and their use in real word applications.
- **3.** Able to understand OSI model with complete structure, functions and its role in data communication.
- 4. Understand the use of network devices at various levels of data communication.

Design and Analysis of Algorithms BTIT403-18.

- 1. For a given algorithms analyze worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms.
- 2. Explain when an algorithm design situation calls for which paradigm.
- 3. Explain a given engineering problem with a tree or graph and write the corresponding algorithm to solve the problem.
- 4. Demonstrate the ways to analyze approximation/ randomized algorithms.
- 5. Examine the necessity for NP class-based algorithms.

Development of Societies HSMC101-18

Students will develop strong natural familiarity with humanities along with right understanding enabling them to eliminate conflict and strife in the individual and society. Students shall be able to relate philosophy to literature, culture, society and lived experience can be considered.

Operating System Lab (BTCS406)

- 1. Demonstrate the installation process of various operating systems.
- 2. Implement virtualization by installing Virtual Machine software.
- 3. Apply Unix/Linux operating system commands.

Understand different Unix/Linux shell scripts and execute various shell programs.

Computer Networks-I Lab

BTIT 404-18

After attending Lab, students will

- 1. Implementation of basic network topologies and their application.
- 2. Able to understand the functional concept of Switches, hubs or routers.
- **3.** Configure basic commands on computer networks.

Design and Analysis of Algorithms Lab

BTIT406-18

The student will be able to:

- 1. Improve practical skills in designing and implementing complex problems with
- 2. Understand comparative performance of strategies and hence choose appropriate,
- 3. Implement various tree and graph-based algorithms

4. Design and implement heuristics for real world problems.

Formal Language & Automata TheoryBTIT501-18

1. Understand a formal notation for strings, languages and machines.

2. Design finite automata to accept a set of strings of a language.

3. Design context free grammars to generate strings of context free language.

4. Write the hierarchy of formal languages, grammars and machines.

5. Distinguish between computability and non-computability and Decidability and undecidability.

Database Management System BTIT502-18

1. Write relational algebra expressions for that query and optimize the Developed expressions

2. Design the databases using ER method and normalization.

3. Construct the SQL queries for Open source and Commercial DBMS-MYSQL, ORACLE, and DB2.

4. Determine the transaction atomicity, consistency, isolation, and durability.

5. Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling.

Cyber laws and IPR (BTIT 509-18

1. Explain the various digital crimes and comprehend the basic features of these crimes.

2. Analyze how laws are enforced in the digital and cyber environment and the challenges that are forced in their enforcement.

3. Understand to identify what is a Protectable Subject matter under Copyright Laws and what is the manner of obtaining Copyright protection.

4. Gain expert knowledge in application of various provisions of Copyright law to determine the rights to which the IP holder will be entitled.

Programming in Java

BTIT503-18

1. Understand the features of Java such as operators, classes, objects, inheritance, packages and exception handling

2. Learn latest features of Java like garbage collection, Console class, Network interface, APIs.

3. Acquire competence in Java through the use of multithreading, applets.

4.Get exposure to advance concepts like socket and database connectivity.

Software EngineeringBTIT504-18

1.Understanding of Software process models such as the waterfall, prototyping and spiral models

2. Understanding of the role of project management including planning, scheduling, risk management, etc.

3. Understanding of object models, data models, context models and behavioral models.

4. Describe implementation issues such as modularity and coding standards.

5. Understanding of software testing approaches such as unit testing, integration testing and system testing.

Database Management System Lab BTIT505-18

1. This practical will enable students to retrieve data from relational databases using SQL.

- 2. students will be able to implement generation of tables using datatypes
- 3. Students will be able to design and execute the various data manipulation queries.
- 4. Students will also learn to execute triggers, cursors, stored procedures etc.

Programming in JAVA Lab BTIT506-18

1. Implement the features of Java such as operators, classes, objects, inheritance, packages and exception handling.

2. Design problems using latest features of Java like garbage collection, Console class, Network interface, APIs.

3. Develop competence in Java using multithreading, Applets etc.

4. Apply advance concepts like socket and database connectivity, and develop project based on industry orientation.

Software Engineering Lab BTIT507-18

1. Select a software engineering process life cycle model.

- 2. Define the requirements of the software.
- 3. Analyze the given specification into a design
- 4. Contrast the various testing and quality assurance techniques.
- 5. 5. Apply modern engineering tools for specification, design, implementation, and testing

Big Data BTIT 601-18

- 1. Understand fundamental concepts of Big Data and its technologies
- 2. Apply concepts of MapReduce framework for optimization
- 3. Analyze appropriate NoSQL database techniques for storing and processing large volumes of structured and unstructured data
- 4. Understand various components of Hadoop ecosystems
- 5. Explore modern tools and packages for data visualization

Web Technologies BTIT602-18

- 1. 1.Understand and apply the knowledge of web technology stack to deploy various web services.
- 2. Analyze and evaluate web technology components for formulating web related problems.
- 3. Design and develop interactive client server internet application that accommodates user specific requirements and constraint analysis.
- 4. Program latest web technologies and tools by creating dynamic pages with an understanding of functions and objects.
- 5. Apply advance concepts of web interface and database to build web projects in multidisciplinary environments.
- 6. Demonstrate the use of advance technologies in dynamic websites to provide performance efficiency and reliability for customer satisfaction.

Machine Learning BTIT 608-18

- 1. 1. Analyse methods and theories in the field of machine learning
- 2. Analyse and extract features of complex datasets
- 3. Deploy techniques to comment for the Regression
- 4. Comprehend and apply different classification and clustering techniques
- 5. Understand the concept of Neural Networks and Genetic Algorithm

Management Information System (BTIT 611-18)

- 1. 1.Understand the basic elements of Cellular Radio Systems and its design
- 2. 2.Learn about the concepts Digital communication through fading multipath channels
- 3. 3.Understand various Multiple Access techniques for Wireless communication
- 4. 4.Know about the Wireless standards and systems

Big Data Lab BTIT 604 -18

- 1. Install and setup Hadoop environment and its various components
- 2. Understand the working of distributed computing by using MapReduce.
- 3. Write scripts and work with R commands and packages
- 4. Apply data visualization by using packages available in R

Web Technologies Lab BTIT 605-18

Students will be able to make web pages using

- 1. HTML and HTML5
- 2. JavaScript
- 3. PHP
- 4. AJAX

Management Informatio n System Lab (BTIT 619-18)

After attending Lab, students will

- 1. Able to understand real world case studies on ERP, SCM and CRM
- 2. Able to know about B2B, B2C e-commerce activities.
- 3. Understand real world scenarios with DSS, AI, and Expert Systems.

Machine Learning Lab BTIT616-18

- 1. 1.Comprehend and apply different classification and clustering techniques
- 2. Understand the concept of Neural Networks and Genetic Algorithm

Software Testing and Quality Assurance BTIT701-18

1. Analyze different approaches to software testing and quality assurance, and select optimal solutions for different situations and project.

- 2. Create test strategies and plans, design test cases, prioritize and execute them
- 3. Manage incidents and risks within a project and generate a risk projection.
- 4. Contribute to efficient delivery of software solutions and implement improvements in the software development processes.
- **5.** Compare and Contrast the various activities of Quality Assurance, Quality planning and Quality Control

Software Project Management BTIT-702

- 1. After undergoing this course, the students will be able to:
- 2. Explain project management in terms of the software development process•
- 3. Estimate project cost and perform cost-benefit evaluation among projects.
- 4. Apply the concepts of project scheduling and risk management.
- 5. Explain Software configuration management and the concepts of contract management.
- 6. Apply quality models in software projects for maintaining software quality and reliability.

Data Warehousing and Data Mining BTIT -706-18

After undergoing this course, the students will be able to:

- 1. Understand the functionality of the various data mining and data warehousing component.
- 2. Understand patterns that can be discovered by association rule mining, classification, and clustering.
- 3. To select the appropriate data mining algorithm for solving practical problems.
- 4. To understand the functionality of search engine.
- 5. To understand the concept of web data mining

Major Project BTIT-703

- 1. Students should be able to design and construct a hardware and software system, component, or process to meet desired needs.
- 2. Students are provided to work on multidisciplinary Problems.

 Students should be able to work as professionals, with portfolio ranging from data management, network configuration, designing hardware, database and software design to management and administration of entire systems.

Department of Computer Science Programme Educational Objectives

PEO1 Graduates will be able to outperform in technical/managerial roles ranging from problem analyzing, solving, designing, development to

production support in software industries as well as in R&D sectors.

PEO2 Graduates will be able to successfully pursue higher education/research in reputed i nstitutions within country or abroad.

PEO3 Graduates will have the ability to adapt, contribute and innovate advance technologies and systems in the key domains of Computer Science & Engineering.

PEO4 Graduates will be ethically and socially responsible solution providers/entrepreneurs in Computer Science disciplines.

Program Outcomes

After the completion of undergraduate course in Computer Science & Engineering, graduates will be able to:

PO1 Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.

PO2 Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

PO4 Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. **PO5** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling to complex engineering activities, with an understanding of the limitations.

PO6Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change."

Programme Specific Outcomes

PSO1: Apply the knowledge of computer system and design principles in building the software and hardware components.

PSO2: Apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications. **PSO3** :Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society

Course Outcomes

Course Title: Data Structure & Algorithms (BTCS301-18)

Course Outcomes:

The student will be able to:

1. For a given algorithm student will able to analyze the algorithms to determine the time and computation complexity and justify the correctness;

2. Student will be able to handle operation like searching, insertion, deletion, traversing on various Data Structures and determine time and computational complexity;

3. Student will able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity;

4. Students will be able to choose appropriate Data Structure as applied to specific problem definition.

5. Demonstrate the reusability of Data Structures for implementing complex iterative problems.

Course Title: Object Oriented Programming Code: BTCS302-18

Course Outcomes:

The student will be able to:

1. Identify classes, objects, members of a class and the relationships among them needed to solve a specific problem;

2. Demonstrate the concept of constructors and destructors. And create new definitions for some of the operators;

3. Create function templates, overload function templates;

4. Understand and demonstrate the concept of data encapsulation, inheritance,

polymorphism with virtual functions; &

5. Demonstrate the concept of file operations, streams in C++ and various I/O manipulators.

Course Code: BTCS303-18	Course Title: Data Structure & Algorithms Lab
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Lab Outcomes:

The student will be able to:

1. Improve practical skills in designing and implementing basic linear data structure algorithms;

2. Improve practical skills in designing and implementing Non-linear data structure algorithms;

3. Use Linear and Non-Linear data structures to solve relevant problems;

4. Choose appropriate Data Structure as applied to specific problem definition; &

5. Implement Various searching algorithms and become familiar with their designmethods.

Lab Outcomes:

The student will be able to:

1. Develop classes incorporating object-oriented techniques;

2. Design and implement object-oriented concepts of inheritance and polymorphism;

3. Illustrate and implement STL class of containers and need for exceptions to handle errors for object oriented programs; &

4. Design and implement any real world based problem involving GUI interface using objectoriented concepts.

BTAM304-18	Mathematics	Paper-III	(Calculus	and	Ordinary
	Differential Eq	uations)			

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

1. Understand the functions of several variables that are essential in mostbranches of engineering;

2. Apply multiple integrals to deal with areas and volumes of various structures which are quitesignificant in real world;

3. Formulate and solveengineering problems related to convergence, infinite series, power series and Taylor series;

4. Create, select and utilize the learnt techniques of first degree ordinary differential equationstomodel real world problems &; Be acquainted with the knowledge required to solve higher order ordinary differential equations.

PHILOSOPHY Coursecode: HSMC102-18

Course Outcomes:

Students will develop strong natural familiarity with humanities along with right understanding enabling them to eliminate conflict and strife in the individualand society. Students shall be able to relate philosophy to literature, culture, society and lived experience can be considered.

^{5.}

COURSE OUTCOME:

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

1. Demonstrate the operation of simple digital gates, identify the symbols, develop the truth table for those gates; combine simple gates into more complexcircuits; change binary, hexadecimal, octal numbers to their decimal equivalentan vice versa.

2. Demonstrate the operation of a flip-flop. Design counters and clear the concept of shift registers.

3. Study different types of memories and their applications.Convert digital signal into analog and vice versa.

Course Outcomes

At the end of this course student will demonstrate the ability to:

- 1. Realize combinational circuits using logic gates.
- 2. Realize sequential circuits using logic gates.
- 3. Realize various types of Flip-flops and counters

Course Code: BTES401-18 Course Title: Computer Organization & Architecture

Course Outcomes:

The student will be able to:

- 1. Understand functional block diagram of microprocessor;
- 2. Apply instruction set for Writingassembly language programs;
- 3. Design a memory module and analyze its operation by interfacing with the CPU;
- 4. Classify hardwired and microprogrammed control units; &
- 5. Understand the concept of pipelining and its performance metrics.

Course Code: BTCS402-18 Course Title: Operating Systems

Course Outcomes:

The student will be able to:

1. Explain basic operating system concepts such as overall architecture, system calls, user mode and kernel mode;

2. Distinguish concepts related to processes, threads, process scheduling, race conditions and critical sections;

3. Analyze and apply CPU scheduling algorithms, deadlock detection and prevention algorithms;

4. Examine and categorize various memory management techniques like caching, paging, segmentation, virtual memory, and thrashing;

5. Design and implement file management system; &

6. Appraise high-level operating systems concepts such as file systems, disk-scheduling algorithms and various file systems.

Course Code: BTCS403-18 **Course Title:** Design and Analysis of Algorithms

Course Outcomes:

The student will be able to:

1. For a given algorithms analyze worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms;

2. Explain when an algorithmic design situation calls for which design paradigm(greedy/ divide and conquer/backtrack etc.);

3. Explain model for a given engineering problem, using tree or graph, and write the corresponding algorithm to solve the problems;

4. Demonstrate the ways to analyze approximation/randomized algorithms (expected running time, probability of error); &

5. Examine the necessity for NP class based problems and explain the use of heuristic techniques.

Course Code: BTES402-18 Course Title: Computer Organization & ArchitectureLab

Lab Outcomes:

The student will be able to:

1. Assemble personal computer;

2. Implement the various assembly language programs for basic arithmetic andlogical operations; &

3. Demonstrate the functioning of microprocessor/microcontroller based systems with I/O interface.

Course Code: BTCS404-18 **Course Title:** Operating Systems Lab

Lab Outcomes:

The student will be able to:

1. Understand and implement basic services and functionalities of the operating system;

2. Analyze and simulate CPU Scheduling Algorithms like FCFS, Round Robin, SJF, and Priority;

3. Implement commands for files and directories;

4. Understand and implement the concepts of shell programming;

5. Simulate file allocation and organization techniques; &

6. Understand the concepts of deadlock in operating systems and implement them in multiprogramming system.

Course Code: BTCS405-18	Course Title: Design and Analysis of
	Algorithms Lab

Lab Outcomes:

The student will be able to:

1. Improve practical skills in designing and implementing complex problems with different techniques;

2. Understand comparative performance of strategies and hence choose appropriate, to apply to specific problem definition;

3. Implement Various tree and graph based algorithms and become familiar with their

design methods; &

4. Design and Implement heuristics for real world problems.

Course code: HSMC122-18

Course Outcomes

By the end of the course, students are expected to become more aware of themselves, and their surroundings (family, society, nature); they would becomemore responsible in life, and in handling problems with sustainable solutions, whilekeeping human relationships and human nature in mind. They would have better criticalability. They would also become sensitive to their commitment towards what they haveunderstood (human values, human relationship and human society). It is hoped that theywould be able to apply what they have learnt to their own self in different day-to-daysettings in real life, at least a beginning would be made in this direction. This is only an introductory foundational input. It would be desirable to follow it upby

- a) Faculty -student or mentor-mentee programs throughout their time with theinstitution.
- b) Higher level courses on human values in every aspect of living. E.g. as aprofessional

Course Code: HSMC102-18	Course Title: PHILOSOPHY

OUTCOME OF THE COURSE:

Students will develop strong natural familiarity with humanities along with right understanding enabling them to eliminate conflict and strife in the individual and society. Students shall be able to relate philosophy to literature, culture, society and lived experiencecan be considered.

BTCS401-18	Discrete Mathematics	
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Course Outcomes

- 1. To be able to express logical sentence in terms of predicates, quantifiers, and logical connectives
- 2. To derive the solution for a given problem using deductive logic and prove the solution based on logical inference
- 3. For a given a mathematical problem, classify its algebraic structure
- 4. To evaluate Boolean functions and simplify expressions using the properties of Boolean algebra

6. To develop the given problem as graph networks and solve with techniques of graph theory.

BTES501-18	Enterprise Resource Planning
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Course outcomes: The students at the end will be able;

- 1. To know the basics of ERP
- 2 To understand the key implementation issues of ERP
- 3. To know the business modules of ERP
- 4. To be aware of some popular products in the area of ERP

Course Code: BTCS501-18 Course Title: Database Management Systems

Course Outcomes:

At the end of study the student shall be able to:

- 1. write relational algebra expressions for a query and optimize the Developed expressions
- 2. design the databases using ER method and normalization.
- 3. construct the SQL queries for Open source and Commercial DBMS-MYSQL, ORACLE, and DB2.
- 4. Determine the transaction atomicity, consistency, isolation, and durability.
- 5. Implement the isolation property, including locking, time stamping based onconcurrency control and Serializability of scheduling.

Course Code: BTCS502-18	Course Title: Formal Language &
	Automata Theory

<u>Course Outcomes:</u> The student will be able to:

- 1. Write a formal notation for strings, languages and machines.
- 2. Design finite automata to accept a set of strings of a language.
- 3. Design context free grammars to generate strings of context free language .

- 4. Determine equivalence of languages accepted by Push Down Automata and languages generated by context free grammars
- 5. Distinguish between computability and non-computability and Decidability and undecidability.

Course Code: BTCS503-18 **Course Title:** Software Engineering

Course Outcomes:

At the end of the course the student should be able to:

- 1. Students should be able to identify the need for engineering approach to software development and various processes of requirements analysis for software engineering problems.
- 2. Analyse various software engineering models and apply methods for design and development of software projects.
- 3. Work with various techniques, metrics and strategies for Testing software projects.
- 4. Identify and apply the principles, processes and main knowledge areas for Software Project Management
- 5. Proficiently apply standards, CASE tools and techniques for engineering software projects

Course Outcomes: Software Engineering Lab (BTCS 506-18)

- 1. Familiarization of different open source software for project plan.
- 2. Study of Software to track the progress of the project.
- 3. Preparation of SRS document, Design Document & Test cases.
- 4. Preparation of SCM & Risk Management Documents.
- To conduct different types of testing for a website. <u>Course Outcomes:</u> The student will be able to:

the

Course Code: BTCS 504-18	Course Title: Computer Networks		
		CO1:	Explain

functions of the different layer of the OSI Protocol;

CO2: Describe the function of each block of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs);

CO3: Develop the network programming for a given problem related TCP/IP protocol; &

CO4: Configure DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.

Course Outcomes:

- 1. This practical will enable students to retrieve data from relational databases using SQL.
- 2. students will be able to implement generation of tables using datatypes
- 3. Students will be able to design and execute the various data manipulation queries.
- 4. Students will also learn to execute triggers, cursors, stored procedures etc.

Course Code: BTCS507-18 Course Title: Computer Networks Lab

Course Outcomes: The students will be able to:

- 1. Know about the various networking devices, tools and also understand the implementation of network topologies;
- 2. Create various networking cables and know how to test these cables;
- 3. Create and configure networks in packet trace rtool using various network devices and topologies;
- 4. Understand IP addressing and configure networks using the subnet in;
- 5. Configure routers using various router configuration commands.

Course Code: BTCS 510-18 **Course Title:** Programming in Python

Course Outcomes:

The students should be able to:

- 1. Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
- 2. Demonstrate proficiency in handling Strings and File Systems.
- Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
- 4. Interpret the concepts of Object-Oriented Programming as used in Python.
- Implement exemplary applications related to Network Programming, Web Services and Databases in Python

Programming in python Lab Course Outcomes:

- 1. To learn and understand Python programming basics and paradigm.
- 2. To learn and understand python looping, control statements and string manipulations.
- 3. Students should be made familiar with the concepts of GUI controls and designing GUI applications.
- 4. To learn and know the concepts of file handling, exception handling and database connectivity.

Course Code: BTCS521- Course Title: Computational Biology

Course Outcomes: The student will be able to:

- 1. Understand the basic of cell structure, divisions involved in reproduction of a cell, andits generic functionality;
- 2. Recognize the base line elements of a RNA and DNA; including fundamental behindtheir complex structure;
- 3. Comprehend primary structure of the protein and various related data-sets.
- 4. Demonstrate the concept of gene sequence alignment and simulate various related algorithms for the same.

Course Code: BTCS 515-18 Course Title: Computer Graphics

Course Outcomes: The students shall be able to:

- 1. Understand about fundamentals of Graphics to enable them to design animated scenes for virtual object creations.
- 2. Make the student present the content graphically.
- 3. Work in computer aided design for content presentation for better analogy data with pictorial representation

Students shall be able to:

- 1. Understand and apply the knowledge of web technology stack to deploy various web services.
- 2. Analyze and evaluate web technology components for formulating web related problems.
- 3. Design and develop interactive client server internet application that accommodates user specific requirements and constraint analysis.
- 4. Program latest web technologies and tools by creating dynamic pages with an understanding of functions and objects.
- 5. Apply advance concepts of web interface and database to build web projects in multidisciplinary environments.
- 6. Demonstrate the use of advance technologies in dynamic websites to provide performance efficiency and reliability for customer satisfaction.

Course Code: BTCS601-18	Course Title : Compiler Design
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Course Outcomes:

After undergoing this course, the students will be able to:

- 1. Build concepts on lexical analysis.
- 2. Understand strategies of syntax analysis.
- 3. Learn techniques of Intermediate code generation.
- 4 Undestand code design issues and design code generator.
- 5. Design and develop optimized codes.

Lab Outcomes of Complier Design Lab

Course Objectives:

- To implement Lexical Analyzer using Lex tool & Syntax Analyzer or parser using YACC Tool
- 2. To implement NFA and DFA from a given regular expression
- 3. To implement front end of the compiler by means of generating Intermediate codes.
- 4. To implement code optimization techniques.

Course Outcomes: At the end of this course student will:

- 1. Design Lexical analyzer for given language using C and LEX tools.
- 2. Design and convert BNF rules into YACC form to generate various parsers.
- 3. Generate machine code from the intermediate code forms
- 4. Implement Symbol table

Course Coue: DICS002-16 Course Thie : Artificial Intelligence	Course Code:BTCS602-18	Course Title : Artificial Intelligence
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Course Outcomes:

After undergoing this course, the students will be able to:

- 1. Build intelligent agents for search and games
- 2 Solve AI problems by learning various algorithms and strategies
- 3. Understand probability as a tool to handle uncertainity
- 4. Learning optimization and inference algorithms for model learning
- 5. Design and develop programs for an reinforcement agent to learn and act in astructured environment

Course Outcomes: AI Lab (BTCS 605-18)

- 1. Familiarization of different uninformed & informed Search Algorithms.
- 2. Understanding of game search algorithm.
- 3. Familiarization and Inference from Bayesian Network.
- 4. Problem solving by using value iteration & Policy iteration in Grid World.
- 5. Understanding of Reinforcement Learning.

Course Code: BTCS 606-18 **Course Title:** Simulation and Modeling

Course Outcomes:

- 1. After undergoing this course, the students will be able to
- 2. Discuss the fundamental elements of discrete-event simulation including statistical models, random processes, random variates, and inputs to simulation
- 3. Analyze a real world problem and apply modelling methodologies to develop adiscreteevent simulation model
- 4. Interpret discrete-event techniques for solving a simulation problem
- 5. Compare and evaluate alternative system designs using sampling and regression

Lab Outcomes of Simulation and Modelling Lab

Course Outcomes: After the successful completion of the course, the students will be able to:

- 1. Describe the role of important elements of discrete event simulation and modelling paradigm.
- 2. Conceptualize real world situations related to systems development decisions, originating from source requirements and goals.
- 3. Develop skills to apply simulation software to construct and execute goal-driven system models.
- 4. Interpret the model and apply the results to resolve critical issues in a real world environment.

Course Code: BTCS608-18 Course Title:Internet of Things

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

- 1. Understand internet of Things and its hardware and software components
- 2. Interface I/O devices, sensors & communication modules
- 3 Remotely monitor data and control devices
- 4. Develop real life IoT based projects

Course Code:BTCS 610-18 Course Title : Digital Image Processing

Course Outcomes:

After undergoing this course, the students will be able to:

- 1. Understand the basic concepts of DIP.
- 2. Improve the quality of digital images.
- 3. Understand and De-noise Digital Images
- 4. Segment digital images and extract various features from digital images
- 5. Understand various image compression techniques and apply such techniques tocompress digital images for reducing the sizes of digital images.

Course Outcomes:

After undergoing this course, the students will be able to:

- 1. Understand the core concepts of the cloud computing paradigm
- 2. Understanding importance of virtualization along with their technologies
- 3. Analyze various cloud computing service and deployment models and apply them tosolve problems on the cloud.
- 4. Implementation of various security strategies for different cloud platform

Course outcomes of Cloud Computing Lab:

- 1. Learn the installation of VMware and Cloudsim
- 2. Implement Various scheduling algorithms on Cloudsim.
- 3. To study various cloud platforms.

Course Outcomes:

After undergoing this course, the students will be able to:

- 1. Explain project management in terms of the software development process
- 2. Estimate project cost and perform cost-benefit evaluation among projects
- 3. Apply the concepts of project scheduling and risk management.
- 4. Explain Software configuration management and the concepts of contractmanagement.
- 5. Apply quality models in software projects for maintaining software quality and reliability

Course Code: BTCS 615-18	Course Title: Software Project
	ManagementLab

Course Outcomes:

After undergoing this course, the students will be able to:

- 1. Plan and manage projects.
- 2. Consolidate and communicate information about their project.
- 3. Create Gantt charts and PERT (Project Evaluation Review Technique) chart of their project
- 4. Manage resources, assignments, work allocation and generate reports to assess projectstatus, project cost status and resource utilization.
- 5. Identify factors affecting the critical path of their project.

Course Outcomes:

After undergoing this course, the students will be able to:

- CO1: Analyse methods and theories in the field of machine learning
- CO2: Analyse and extract features of complex datasets
- CO3: Deploy techniques to comment for the Regression
- CO4: Comprehend and apply different classification and clustering techniques
- CO5: Understand the concept of Neural Networks and Genetic Algorithm

Course Outcomes of Machine Learning Lab

Students will be able to:

- 1. Recognize the characteristics of machine learning that make it useful to real-world problems.
- 2. Characterize machine learning algorithms as supervised, semi-supervised, and unsupervised.
- 3. Effectively use machine learning toolboxes.
- 4. Be able to use support vector machines.
- 5. Be able to use regularized regression algorithms.
- 6. Understand the concept behind neural networks for learning non-linear functions.
- 7. Understand and apply unsupervised algorithms for clustering.
- 8. Understand the foundation of generative models.
- 9. Understand the inference and learning algorithms for the hidden Markov model.
- 10. Understand the learning algorithm for hidden Markov model with latent variables.
- 11. Understand algorithms for learning Bayesian networks.
- 12. Understand reinforcement learning algorithms.

Course Code: BTCS620-18 Course Title:Mobile Application Development

Course Outcomes:

CO 1: Describe those aspects of mobile programming that make it unique fromprogramming for other platforms,

CO 2: Critique mobile applications on their design pros and cons,

CO 3: Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces,

CO 4: Program mobile applications for the Android operating system that use basic and advanced phone features, and

CO 5: Deploy applications to the Android marketplace for distribution

Course Code: BTCS 701-18	Course Title : Network Security an	d
	Cryptography	

Course Outcomes:

After undergoing this course, the students will be able to:

CO1: Understand the fundamental principles of access control models and techniques, authentication and secure system design

CO2: Have a strong understanding of different cryptographic protocols and techniques andbe able to use them.

CO3: Apply methods for authentication, access control, intrusion detection and prevention.CO4: Identify and mitigate software security vulnerabilities in existing systems.

Course Code: BTCS 704-18 Course Title : Deep Learning

Course Outcomes:

After undergoing this course, the students will be able to:

CO1: Comprehend the advancements in learning techniques

CO2: Compare and explain various deep learning architectures and algorithms.

CO3: Demonstrate the applications of Convolution Networks

CO4: Apply Recurrent Network for Sequence Modelling

CO5: Deploy the Deep Generative Models

Course Code:BTCS706-18	Course Title: Distributed Databases

COURSE OUTCOMES

After completion of course, students would be able to:

Agile Software Development Lab Course Objectives:

- 1. Understand agile development processes and the principles behind the Agile Manifesto.
- 2. Learn Scrum, Extreme Programming (XP), and Kanban frameworks
- 3. Develop an understanding of when to use agile methodologies (and when not to) and how to tailor agile practices

Course Code:	Course Title: Block Chain
BTCS721-18	Technology

COURSE OUTCOMES

CO1: Understand emerging abstract models for Block chain Technology.

CO2: Identify major research challenges and technical gaps existing between theory and practice incrypto currency domain.

CO3: It provides conceptual understanding of the function of Blockchain as a method of securing distributed ledgers, how consensus on their contents is achieved, and the new applications that they enable.

CO4: Apply hyperledger

BTCS 716-18 Adhoc and Wireless Sensor Networks

Course Outcomes:

After undergoing this course, the students will be able to: Fabric and Etherum platform to implement the Block chain Application.

- 1. Explain the Fundamental Concepts and applications of ad hoc and wireless sensor networks and apply this knowledge to identify the suitable routing algorithm based on the network
- 2. Apply the knowledge to identify appropriate physical and MAC layer protocols
- 3. Understand the transport layer and Describe routing protocols for ad hoc wireless networks with respect to TCP design issues
- 4. Be familiar with the OS used in Wireless Sensor Networks and build basic modules.
- 5. Understand the Challenges in security provisioning ,Security Attacks and security issues possible in Adhoc and Sensors Networ

Adhoc and Wireless Sensor Networks Lab (BTCS 717-18)

Course Outcomes:

- 1. Familiarization of different Simulation Tools for Wireless Networks.
- 2. Installation of Simulation Tools for WSN.
- 3. Implementation of various Reactive Routing Protocols in NS2.
- 4. of various Proactive Routing Protocols in NS2.

Course Code: BTCS718-18 Course Title: Quantum Computing

Course Outcomes;

At the end of the course students should:

- 1. understand the quantum model of computation and the basic principles of quantum mechanics;
- 2. be familiar with basic quantum algorithms and their analysis;
- 3. be familiar with basic quantum protocols such as teleportation and super dense coding;
- 4. see how the quantum model relates to classical models of deterministic and probabilistic computation.

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution are stated and displayed on website and communicated to teachers and students

Vision of Institute:

"To attain the coveted status of a growth-oriented resource of National Importance known for quality professional education, research and innovation".

Mission of the Institute:

"To provide professional education with a difference confirming a confluence of inter-/multidisciplinary knowledge domains; targeting excellence in collaboration with Industry; promoting creative competence and innovation aimed at producing skilled human resource and entrepreneurs; sustaining Indian ethics & moral values".

Vision of the Department:

"We, the department of Electrical Engineering, perceive amalgamation of academia, research and industry paving the way to zenith for innovative, competent and self-sustainable professionals."

Mission of the Department:

- **M1.** To create and sustain environment of learning in which Electrical engineering graduates acquire knowledge and implement it professionally with due consideration of ethical and economical issues.
- M2. To produce innovative, vibrant leaders and entrepreneurs in core and allied fields to minimize skill gap between academia & industry.
- **M3.** Transforming the Department of Electrical Engineering into nationally recognized Centre of Excellence.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO's)

PEO1. Graduates will have Technical, Analytical abilities & skills suitable to cater the need of Industry & Society.

- **PEO2.** Graduates will have successful career in core and inter disciplinary fields.
- **PEO3.** Graduates will follow professional ethics and generate an attitude of research oriented continuous learning.

PROGRAMME SPECIFIC OUTCOMES (PSO's)

- **PSO1.** Graduates will have knowledge of principles, design and performance & testing of static & dynamic electrical machines.
- **PSO2.** Graduates will gain knowledge and acquire skills for analysis, operation, control and protection of electrical power system for generation, transmission, distribution & utilization.
- **PSO3.** Graduates will gain knowledge of instrumentation, control & automation and powertronics applicable in core and related fields.

<u>PO's</u>

After the successful completion of undergraduate course, Electrical Engineering, Graduates will be able to:

- **PO1:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.
- **PO2:** Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO3:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

- **PO4:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- **PO5:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling to complex engineering activities, with an understanding of the limitations.
- **PO6:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- **PO7:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- **PO8:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **PO9:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- **PO10:** Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- **PO11:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **PO12:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

SYLLABUS

BTEE-301-18	Electrical Circuit Analysis		3L:1T:0P	4 credits
Internal Marks: 40	External Marks: 60	Total Marks	: 100	

Course Outcomes:

At the end of this course, students will demonstrate the ability to:

CO 1	Apply network theorems for the analysis of electrical circuits.
CO 2	Obtain the transient and steady-state response of electrical circuits.
CO 3	Analyze circuits in the sinusoidal steady-state (single-phase and three-
	phase). Analyze two port circuit behavior.
CO 4	Synthesize networks and filters.

Module 1: Basic Network Analysis (14 Hours)

Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Reciprocity theorem, Compensation theorem. Analysis with dependent current and voltage sources. Node and Mesh Analysis. Concept of duality and dual networks. Solution of first and second order differential equations for series and parallel R-L, R-C, R-L-C circuits, initial and final conditions in network elements, forced and free response, time constants, steady state and transient state response.

Module 2: Electrical circuit and steady state analysis (14 Hours)
Representation of sine function as rotating phasor, phasor diagrams, impedances and admittances, AC circuit analysis, effective or RMS values, average power and complex power. Three-phase circuits. Mutual coupled circuits, Dot convention in coupled circuits, Ideal Transformer. Analysis of electrical circuits using Laplace Transform for standard inputs, transformed network with initial conditions. Frequency response (magnitude and phase plots), series and parallel resonances.

Module 3: Network functions and two port network (10 Hours)

Driving point impedance and admittance, natural response of a network, transfer impedance and admittance, concept of pole and zeros in a network function, Routh Hurwitz criterion of stability. Two Port Networks: terminal pairs, relationship of two port variables, impedance parameters,

admittance parameters, transmission parameters and hybrid parameters, interconnections of two port networks.

Module 4: Network Synthesis and Filters (10 Hours)

Network synthesis techniques for 2-terminal network, Foster and Cauer forms.

Filters: Classification of filters, characteristics impedance and propagation constant of pure reactive network, ladder network, T-section, π -section, terminating half section, pass bands and stop bands, Design of constant-K, m-derived filters.

Text / References:

1. M. E. Van Valkenburg, "Network Analysis", Prentice Hall, 2006.

- 2. D. Roy Choudhury, "Networks and Systems", New Age International Publications, 1998.
- 3. W. H. Hayt and J. E. Kemmerly, "Engineering Circuit Analysis", McGraw Hill Education, 2013.
- 4. C. K. Alexander and M. N. O. Sadiku, "Electric Circuits", McGraw Hill Education, 2004.
- 5. K. V. V. Murthy and M. S. Kamath, "Basic Circuit Analysis", Jaico Publishers, 1999.

Course Objectives:

- 1. To develop an understanding of the fundamental laws and elements of electric circuits and networks.
- 2. To solve the electrical circuits using different theorems.
- 3. To represent the basic circuits in time and frequency response with application of mathematics in engineering like Laplace transforms, first and second order differential equations.
- 4. To understand the concept of two port networks and realize the networks using different properties.
- 5. To design different types of passive filters.

Course Outcomes

After the completion of the course the student will be able to:

- CO1. Apply network theorems for the analysis of electrical circuits.
- CO2. Obtain the transient and steady-state response of electrical circuits.
- CO3. Analyze circuits in the sinusoidal steady-state (single-phase and three-phase). Analyze two port circuit behavior.

DAV Institute of Engineering & Technology

Department of Electrical Engineering

<u>Course Outcomes</u>

Upon successful completion of this course, the student will intend to apply the various outcome as:

Course code: BTEE-101-18 Course Title: Basic Electrical Engineering

Course Outcomes:

- **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.

Course code: BTEE-301-18 Course Title: Electrical Circuit Analysis

Course Outcomes:

- **CO1.** Apply network theorems for the analysis of electrical circuits.
- CO2. Obtain the transient and steady-state response of electrical circuits.
- **CO3.** Analyze circuits in the sinusoidal steady-state (single-phase and three-phase). Analyze two port circuit behavior.
- CO4. Synthesize networks and filters.

Course code: BTEE-302-18 Course Title: Analog Electronics

Course Outcomes:

- CO1. Understand the characteristics of transistors.
- CO2. Design and analyse various rectifier and amplifier circuits.
- CO3. Design sinusoidal and non-sinusoidal oscillators.
- CO4. Understand the functioning of OP-AMP and design OP-AMP based circuits.

Course code: BTEE-303-18 Course Title: Electrical Machines-I

Course Outcomes:

CO1. Understand the concepts of magnetic circuits.

- CO2. Understand the operation of DC machines.
- CO3. Analyse the differences in operation of different DC machine configurations.
- CO4. Analyse single phase and three phase transformers circuits.

Course code: BTEE-304-18 Course Title: Electromagnetic Fields

Course Outcomes:

- **CO1.** To understand the basic laws of electromagnetism.
- **CO2.** To obtain the electric and magnetic fields for simple configurations under static conditions.
- CO3. To analyse time varying electric and magnetic fields.
- CO4. To understand Maxwell's equation in different forms and different media.
- CO5. To understand the propagation of EM waves.

Course code: BTEE-305-18 Course Title: Engineering Mechanics

Course Outcomes:

- CO1. Understand the concepts of co-ordinate systems.
- **CO2.** Analyse the three-dimensional motion.
- CO3. Understand the concepts of rigid bodies.
- **CO4.** Analyse the free-body diagrams of different arrangements.
- CO5. Analyse the free-body diagrams of different arrangements.

Course code: BTEE-401-18 Course Title: Digital Electronics

Course Outcomes:

- CO1. Understand working of logic families and logic gates.
- CO2. Design and implement Combinational and Sequential logic circuits.
- **CO3.** Understand the process of Analog to Digital conversion and Digital to Analog conversion.
- **CO4.** Be able to understand memories.

Course code: BTEE-402-18 Course Title: Electrical Machines – II

Course Outcomes:

- **CO1.** Understand the concepts of rotating magnetic fields.
- CO2. Understand the operation of AC machines.
- **CO3.** Analyse performance characteristics of AC machines.
- **CO4.** To understand the difference between the synchronous machines and asynchronous machines.

Course code: BTEE-403-18

Course Title: Power Electronics

Course Outcomes:

- CO1. Understand the differences between signal level and power level devices.
- CO2. Analyse controlled rectifier circuits.
- **CO3.** Analyse the operation of DC-DC choppers.
- CO4. Analyse the operation of voltage source inverters.

Course code: BTEE-404-18 Course Title: Signals and Systems

Course Outcomes:

- **CO1.** Understand the concepts of continuous time and discrete time systems.
- CO2. Analyse systems in complex frequency domain.
- **CO3.** Understand sampling theorem and its implications.
- CO4. Understand mathematical tools to be able to apply in state variable modeling

Course code: BTAM-302-18

Course Title: Mathematics-III (Probability and Statistics)

Course Outcomes:

- **CO1.** Have basics knowledge about measure of central tendency, skewness, kurtosis and moments and their applications in engineering fields.
- **CO2.** Familiarize the student with expectations of discrete and continuous random variable.
- **CO3.** Familiarize probability techniques and random variables and detailed knowledge of probability distribution with so as to use it with any date of engineering problem formulation.
- **CO4.** Have basic idea about statistics including correlation, regression and then up to advanced level with testing of large samples that is important in solving problems related to engineering.
- **CO5.** To fit the given data into curves by various methods which forms an important application in engineering.

Course code: BTEE-501-18

Course Title: Power Systems-I (Apparatus and Modelling)

- **CO1.** Understand the concepts of power systems.
- CO2. Understand the various power system components.
- **CO3.** Evaluate fault currents for different types of faults.
- **CO4.** Understand the generation of over-voltages and insulation coordination.
- **CO5.** Understand basic protection schemes.
- **CO6.** Understand concepts of HVDC power transmission and renewable energy generation.

Course code: BTEE-502-18 Course Title: Control Systems

Course Outcomes:

- **CO1.** Understand the modelling of linear-time-invariant systems using transfer function and state-space representations.
- **CO2.** Understand the concept of stability and its assessment for linear-time invariant systems. Design simple feedback controllers.

Course code: BTEE-503-18 Course Title: Microprocessors

Course Outcomes:

- CO1. Study of 8085 and 8086 Microprocessors
- **CO2.** Do assembly language programming.
- CO3. Do interfacing design of peripherals like 8255, 8253,8279,8251 etc.
- CO4. Develop systems using different microprocessors.

Course code: BTEE-504A-18

Course Title: Electrical Engineering Materials – PE-1

Course Outcomes:

- **CO1.** To Understand the basic concepts of materials.
- **CO2.** To use simplified materials selection concepts for design purposes.
- **CO3.** To Understand the properties of Materials.

Course code: BTEE-504B-18 Course Title: Switchgear and Protection – PE-1

Course Outcomes:

- CO1. Understand power system protection.
- **CO2.** Understand the main components used in power system protection for electric machines, transformers.
- **CO3.** Understand the bus bars, overhead and underground feeders.
- **CO4.** Understand the earthing protection.

Course code: BTEE-504C-18

Course Title: Electrical Machine Design – PE-1

Course Outcomes:

CO1. Understand the construction and performance characteristics of electrical machines.

- **CO2.** Understand the various factors which influence the design: electrical, magnetic and thermal loading of electrical machines
- **CO3.** Understand the principles of electrical machine design and carry out a basic design of an ac machine.
- **CO4.** Use software tools to do design calculations.

Course code: BTEE-404-18 Course Title: Renewable Energy Sources – PE-1

Course Outcomes:

- **CO1.** To Understand the Need, importance and scope of non-conventional and alternate energy resources.
- CO2. To understand role significance of solar energy and wind energy
- CO3. To understand the role of ocean energy in the Energy Generation.
- CO4. To get the utilization of Biogas plants and geothermal energy
- $\ensuremath{\textbf{CO5.}}$ To understand the concept of energy Conservation

Course code: BTEE-601-18

Course Title: Power Systems – II (Operation & Control)

Course Outcomes:

- **CO1.** Use numerical methods to analyze a power system in steady state.
- CO2. Understand stability constraints in a synchronous grid.
- **CO3.** Understand methods to control the voltage, frequency and power flow.
- CO4. Understand the monitoring and control of a power system.
- **CO5.** Understand the basics of power system economics.

Course code: BTEE-602-18 Course Title: Power Generation and Economics

Course Outcomes:

- CO1. Understand the load curves, load-duration Curve.
- **CO2.** Understand the power plant economics and tariff
- **CO3.** Explore the significance of economic operation of steam plants
- **CO4.** Understand the hydro-thermal coordination.

Course code: BTEE-603A-18

Course Title: Electromagnetic Waves – PE-2

- **CO1.** Analyse transmission lines and estimate voltage and current at any point on transmission line for different load conditions.
- CO2. Provide solution to real life plane wave problems for various boundary conditions.
- **CO3.** Analyse the field equations for wave propagation in special cases such as lossy and low loss dielectric media.
- **CO4.** Visualize TE and TM mode patterns of field distributions in a rectangular waveguide.
- **CO5.** Understand and analyse radiation by antennas.

Course code: BTEE-603B-18

Course Title: Power System Dynamics and Control – PE-2

Course Outcomes:

- **CO1.** Understand the problem of power system stability and its impact on the system.
- **CO2.** Analyse linear dynamical systems and use of numerical integration methods.
- CO3. Model different power system components for the study of stability.
- **CO4.** Understand the need and plan the methods to improve stability.

Course code: BTEE-603C-18 Course Title: Electrical Drives – PE-2

Course Outcomes:

- **CO1.** Understand the characteristics of dc motors and induction motors.
- **CO2.** Understand the principles of speed-control of dc motors and induction motors.
- **CO3.** Apply the knowledge of power electronics to understand the working of dc-dc converters.
- **CO4.** Apply the knowledge of control system for the speed control of electrical machines.
- **CO5.** Understand the working of AC and DC drives

Course code: BTEE-603D-18 Course Title: Wind and Solar Energy Systems – PE-2

- **CO1.** Understand the global energy scenario and the consequent growth of the power generation from renewable energy sources.
- CO2. Understand the basic physics of wind and solar power generation.
- CO3. Apply the knowledge of electrical machines to generate electrical power from wind
- CO4. Understand the power electronic interfaces for wind and solar generation.

CO5. Understand the issues related to the grid-integration of solar and wind energy systems.

Course code: BTEE-604A-18 Course Title: High Voltage Engineering – PE-3

Course Outcomes:

- **CO1.** Understand the basic physics related to various breakdown processes in solid, liquid, and gaseous insulating materials.
- CO2. Knowledge of generation and measurement of D.C., A.C., & Impulse voltages.
- **CO3.** Knowledge of tests on H. V. equipment and on insulating materials, as per the standards.
- **CO4.** Knowledge of how over-voltages arise in a power system, and protection against these over-voltages.

Course code: BTEE-604B-18 Course Title: Power System Reliability – PE-3

Course Outcomes:

- **CO1.** Understand the basic quantitative reliability analysis
- **CO2.** Understand the reliability modeling and analysis of electric power systems.
- CO3. Knowledge of reliability assessment for elements of transmission system.
- **CO4.** Understand the risk analysis in power system planning.

Course code: BTEE-604C-18

Course Title: Line-Commutated and Active PWM Rectifiers – PE-3 Course Outcomes:

- CO1. Analyse controlled rectifier circuits.
- **CO2.** Understand the operation of line-commutated rectifiers 6 pulse and multi-pulse configurations.
- **CO3.** Understand the operation of PWM rectifiers operation in rectification and regeneration modes and lagging, leading and unity power factor mode.

Course code: BTEE-604D-18

Course Title: Energy Efficient Systems – PE-3

- CO1. Understand the basic electricity billing and electrical load management
- **CO2.** Understand the refrigeration and air conditioning system

- **CO3.** Knowledge of light source, choice of lighting, luminance requirements, and energy conservation avenues.
- CO4. Understand the diesel generating system and energy efficient technologies.

Course code: BTEE-701D-18

Course Title: Electrical and Hybrid Vehicles

Course Outcomes:

- **CO1.** Understand the conventional vehicles models and electric trains.
- **CO2.** Understand the different possible ways of energy storage
- **CO3.** Compare the different strategies related to energy storage systems and knowledge of the implementation issues.

Course code: BTEE-702D-18 Course Title: Distributed Generation

Course Outcomes:

- **CO1.** To impart knowledge about distributed generation technologies.
- CO2. Their interconnection in grid
- **CO3.** To understand relevance of power electronics in DG, to understand concept of microgrid

Course code: BTEE-703D-18

Course Title: Energy Storage System

Course Outcomes:

- **CO1.** Understand the different possible ways of energy storage.
- **CO2.** Understand the different strategies related to energy storage systems.
- CO3. Link the real-life examples with various industry related case studies.

Course code: HSMC-103-18

Course Title: Education, Technology and Society

Course Outcomes:

CO1. On successful completion of this course, the students will be able to integrate their technical education for betterment of society as well motivates them to lead a good human life.

DAV Institute of Engineering & Technology

Department of Electrical Engineering

<u>Laboratory Outcomes</u>

Upon successful completion of this course, the student will intend to apply the various outcome as:

Course code: BTEE-102-18

Course Title: Basic Electrical Engineering Laboratory

Laboratory Outcomes:

- **CO1.** The ability to use common electrical measuring instruments and understand the fundamentals of electrical engineering.
- **CO2.** The ability to make electrical connections, and measure power, power factor using appropriate equipments.
- CO3. Have the knowledge of electrical machines, components and their ratings.
- CO4. Understand the operation of transformers and electrical machines.

Course code: BTEE-311-18

Course Title: Analog Electronics Laboratory Laboratory

Laboratory Outcomes:

- **CO1.** Understand the use and importance of various types of equipments used in the laboratory.
- CO2. Ability to make circuits on bread-board.
- **CO3.** Analyze, take measurements to understand circuit behavior and performance under different conditions.
- CO4. Troubleshoot, design and create electronic circuits meant for different applications.
- **CO5.** Evaluate the performance electronic circuits and working small projects employing semiconductor devices.

Course code: BTEE-312-18 Course Title: Electrical Machines – I Laboratory

Laboratory Outcomes:

- **CO1.** Analyze three-phase transformer/system connections.
- **CO2.** Evaluation of equivalent circuit parameters, efficiency and voltage regulation by performing various tests on transformer.
- **CO3.** Analyze parallel operation of transformers.
- **CO4.** Analyze performance characteristics of DC generators.

Course code: BTEE-411-18

Course Title: Measurements and Instrumentation Laboratory

Laboratory Outcomes:

- CO1. Design and validate DC and AC bridges.
- CO2. Analyze the dynamic response and the calibration of few instruments.
- **CO3.** Learn about various measurement devices, their characteristics, their operation and their limitations.

CO4. Understand statistical data analysis.

CO5. Understand computerized data acquisition.

Course code: BTEE-412-18 Course Title: Digital Electronics Laboratory

Laboratory Outcomes:

- **CO1.** To understand of basic electronic components and circuits
- **CO2.** Understanding verify truth tables of TTL gates
- CO3. Design and fabrication and realization of all gates and basic circuits
- CO4. Design the truth tables and basic circuits
- CO5. Testing of basic electronics circuits

Course code: BTEE-413-18 Course Title: Electrical Machines-II Laboratory

Laboratory Outcomes:

- CO1. Construct equivalent circuits induction motors by routine tests.
- **CO2.** Comprehend the requirement of starting and speed control methods of induction motors in the various applications of industry.
- CO3. Construct equivalent circuits of synchronous generator and motor.
- **CO4.** Apply knowledge to show utility of alternator, synchronous motors and synchronous condenser for various applications in power system.
- CO5. Construct characteristic curves for induction and synchronous machines
- **CO6.** Understand the concept of parallel operation of three phase alternators.

Course code: BTEE-414-18 Course Title: Power Electronics Laboratory

Laboratory Outcomes:

- **CO1.** Understand the properties and characteristics of thyristors.
- CO2. Understand the different types of waveforms of inverter and chopper circuits.
- **CO3.** Analyze speed and direction control of single phase and three phase electric motors using ac and dc drive.
- **CO4.** Understand the effect of free-wheeling diode on pf with RL load.
- **CO5.** Check the performance of a choppers, and inverter.

Course code: BTEE-511-18

Course Title: Power Systems – I Laboratory

Laboratory Outcomes:

Hands-on experiments related to the course contents of BTEE501-18.

CO1. Understand the concepts of power systems.

- **CO2.** Understand the various power system components.
- **CO3.** Evaluate fault currents for different types of faults.
- CO4. Understand the generation of over-voltages and insulation coordination.
- **CO5.** Understand basic protection schemes.
- **CO6.** Understand concepts of HVDC power transmission and renewable energy generation.

Visits to power system installations (generation stations, EHV substations etc.) are Exposure to fault analysis and Electro-magnetic transient program (EMTP) and Numerical Relays are suggested.

Course code: BTEE-512-18 Course Title: Control Systems Laboratory

Laboratory Outcomes:

Hands-on experiments related to the course contents of BTEE502-18

- **CO1.** Understand the modelling of linear-time-invariant systems using transfer function and state-space representations.
- **CO2.** Understand the concept of stability and its assessment for linear-time invariant systems. Design simple feedback controllers.

Course code: BTEE-513-18

Course Title: Microprocessors Laboratory

Laboratory Outcomes:

Hands-on experiments related to the course contents of BTEE503-18

- CO1. Study of 8085 and 8086 Microprocessors
- **CO2.** Do assembly language programming.
- CO3. Do interfacing design of peripherals like 8255, 8253,8279,8251 etc.
- **CO4.** Develop systems using different microprocessors.

Course code: BTEE-611-18

Course Title: Electronics Design Laboratory

Laboratory Outcomes:

- **CO1.** Understand the practical issues related to practical implementation of applications using electronic circuits.
- CO2. Choose appropriate components, software and hardware platforms.
- **CO3.** Design a Printed Circuit Board, get it made and populate/solder it with components.
- **CO4.** Work as a team with other students to implement an application.

Course code: BTEE-612-18

Course Title: Power Systems-II Laboratory

Laboratory Outcomes:

Hands-on and computational experiments related to the course contents of BTEE-601-18. This should include programming of numerical methods for solution of the power flow problem and stability analysis.

- **CO1.** Use numerical methods to analyze a power system in steady state.
- CO2. Understand stability constraints in a synchronous grid.
- **CO3.** Understand methods to control the voltage, frequency and power flow.
- **CO4.** Understand the monitoring and control of a power system.
- **CO5.** Understand the basics of power system economics.

Visit to load dispatch centre is suggested.

Course code: BTEE-513-18 Course Title: Project -1

Laboratory Outcomes:

CO1. Apply and verify basic scientific principals and technologies.

- CO2. Identify the scope of interdisciplinary knowledge
- CO3. Make and design a prototype which is preferably a working model

Course code: BTEE-721-18 Course Title: Project-2

Course Outcomes:

CO1. Apply and verify basic scientific principals and technologies.

- CO2. Application of interdisciplinary knowledge
- **CO3.** To identify possible product that can be made from the project for commercial purpose.

DAV Institute of Engineering and Technology, Jalandhar

Department of Business Management

MBA 1st Semester

MBA 101-18 FOUNDATIONS OF MANAGEMENT

Course Objectives

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

After the completion of the course the student will be able to:

CO1.Understand the key management concepts, principles and contribution by different Management thinkers.

CO2. Plan, forecast and make rational decisions.

CO3. Analyzeand design organization for effective management.

CO4. Apply controlling and modern management techniques.

MBA 102-18 MANAGERIAL ECONOMICS

Course Objectives

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 appreciates associated opportunities, risks and challenges and their relevance for managerial decisions.

Course Outcomes

After the completion of the course the student will be able to:

CO1. Understand the roles of managers in firms.

CO2. Analyze the demand and supply conditions and assess the position of a company.

CO3. Design competition strategies, including costing, pricing, product differentiation, and market environment according to the natures of products and the structures of the markets.

CO 4. Analyze real-world business problems with a systematic theoretical framework.

CO5. Make optimal business decisions by integrating the concepts of economics, mathematics and statistics.

MBA 103-18 QUANTITAIVE TECHNIQUES

Course Objectives

To acquaint the students with quantitative and operations research techniques that

play an important role in managerial decision

Course Outcomes

Students will be able to

CO1. Demonstrate their understanding of the various measures of central tendency

CO2 Demonstrate their understanding of the symmetry of the various frequency distributions and

the concept of moments and their relation with frequency distribution.

CO3 Classification of Correlation and regression of variables and relation of its

coefficients

CO4 Generate various coefficients of correlation and regression lines from the data.

CO5 Compile Probability distributions from the frequency distributions.

CO6.Illustrate various examples from daily life related to transportation, game

theory and PERT/CPM.

MBA104-18 ACCOUNTING FOR MANAGEMENT AND REPORTING

Course Objectives:

- 1. To Acquaint the students regarding various Accounting Concepts and its application in managerial decision making.
- 2. To familiarize the students about financial analysis and various tools of analysis
- 3. To accustom the students about various costing and budgeting techniques.
- 4. To familiarize the students about latest developments in cost management and Financial Reporting

- CO1 Understand the role of different branches of accounting i.e. Cost, Management and Financial Accounting. The importance of accounting standards and the balance sheets of Public Limited, Banking and Insurance companies.
- CO2 Analyse the financial statements using various tools such as common size statement, comparative statements, ratio analysis, fund flow and cash flow statements.
- CO3 Understand various types of costs, break even analysis, Variance analysis and budgeting techniques.
- CO4 Illustrate latest developments in accounting such as HRA, ABC, Life Cycle Costing, Target Costing, Inflation Accounting and Financial Reporting.

MBA 105-18 - BUSINESS ENVIRONMENT AND INDIAN ECONOMY

Course objectives

1. This course systematically explores the external environment in which businesses operate- legal& regulatory, macroeconomic, cultural, political, technological and natural.

2. The course will examine the critical opportunities and threats that arise from an analysis of external business conditions. Students will apply scenario planning to a selected industry and synthesize trends in the external environment in the presence of risk and uncertainty.

Course Outcomes

CO1. Understand the business environment and its impact on business.

CO2. Analyze the constituents of micro and macro environment.

CO3. Illustrate the knowledge of public sector and consumerism in India.

CO4. Understandthe Indian economy and development strategies

MBA 106-18 BUSINESS ETHICS AND CORPORATE SOCIAL RESPONSIBILITY

Course Objective

This Paper introduces students to the relationship between business and ethics, and tries them to understand how ethical principles could influence management decisions. It also signifies the concept of CSR and its implications on business.

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

CO1: To integrate and apply contemporary Ethics & Governance issues in a business context

CO2: To analyse and apply ethics to contemporary business practices.

CO3: To analyse key perspectives on corporate social responsibility and their application.

CO4: To evaluate different corporate ownership structures and their key governance features.

CO5: To understand the ethical decision making, ethical reasoning, the dilemma resolution process.

CO6: To analyse and apply corporate governance perspectives to contemporary business practices

MBA 2nd Semester

MBA 201-18 BUSINESS ANALYTICS FOR DECISION MAKING

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

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

CO1: To have a deeper and rigorous understanding of fundamental concepts in business decision making under subjective conditions

CO2: To enhance knowledge in probability theory and normality and its distribution concepts

CO3: To conduct research surveys through multiple regression and multiple correlation

CO4: To design a good quantitative purpose statement and good quantitative research questions and hypotheses

CO5: To know the various types of quantitative sampling techniques and conditions to use.

CO6: To utilize the time series method to predict the future of sales in a concern.

MBA 202-18LEGAL ENVIRONMENT FOR BUSINESS

Course Objective: The objective of this paper is to give an exposure to students about important commercial, corporate and taxation laws, so that they can relate the impact of these legal enactments on business in an integrated manner.

Course Outcomes: Following are the expected outcomes of the course:

1. Students shall be able to understand the legal and regulatory framework of business environment.

2. Students shall be able to identify the fundamental legal principles behind contractual agreements.

3. Students shall be able to understand the legal provisions of sales of goods.

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

5. Students shall understand legal rules governing admission, retirement and death of partner and dissolution of partnership firm.

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

MBA 203-18MARKETING MANAGEMENT

Course Objective: 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 204-18

HUMAN RESOURCE MANAGEMENT

Course Objective: The objective of the paper is to make student aware of the various functions and importance of 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.

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

CO1- To explain the basics of Human Resource Management and analyze the evolution of HRM.

CO2- To comprehend the environment of HRM.

CO3: To appraise various functions of HRM that facilitate employee hiring viz. human resource planning, job analysis recruitment and selection.

CO4: To understand the role of training, development, career planning and performance appraisal functions in human resource development.

CO5: To examine the provisions of employee health, safety, and welfare.

CO6: To analyze the concerns of government, employees and employers in establishing Industrial relations.

CO7: To illustrate mechanisms adopted by the organizations for settlement of disputes and grievances

MBA 205-18 PRODUCTION & OPERATIONS MANAGEMENT

Course 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 206-18 CORPORATE FINANCE AND INDIAN FINANCIAL SYSTEM

Course Objective: To provide an in-depth understanding of the core finance functions and decisions in corporate financial management. Further provide a practical and problem insight for effective financial decision-making.

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

CO1- To explain the evolution, objectives and functions of corporate finance and interface of corporate finance with other functional areas.

CO2- To illustrate the concept of time values of money and valuation of securities.

CO3: To comprehend the significance of capital structure theories in capital structure decisions.

CO4: To understand the applications of approaches of working capital management.

CO5: To be able to describe the role of various financial institutions on Indian financial system.

CO6: To discuss the evolution of financial markets and various financial instruments.

MBA 207-18 ENTREPRENEURSHIP DEVELOPMENT AND PROJECT MANAGEMENT

Course Objective: To provide a comprehensive understanding of the concept of an entrepreneur and intricacies involved in managing entrepreneurial projects. The prime aim is to imbibe the necessary entrepreneurial competencies among students and motivate them choose Entrepreneurship as a feasible and desirable career option.

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 analyze different phases of project management viz. generation and screening of project ideas, project analysis, selection, financing, implantation, and review.

MBAGE 201-18 COMPUTER APPLICATIONS FOR BUSINESS

Course Objective: The purpose of this course is to provide a through exposure to the operating and office management tools available in different packages. A student can be exposed to the working knowledge of Windows based operating systems and software packages such as Windows-95, 98, 2000-Professional, windows -XP and MS -Office.

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 3rdSemester

MBA -301 APPLIED OPERATION RESEARCH

Course Objectives

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.

Course outcomes

After successful completion of the course, student will be able to understand and grasp the concept of Applied Operations Research.

CO1 To have the knowledge of role of O.R. in solving industrial problems.

CO2 To introduce the important ideas in operations research which are both fundamental and long lasting.

CO3 To provide those students not going beyond a single introductory course with enough understanding and confidence to appreciate the strengths and inherent limitations of the operations research approach.

CO4 To prepare and motivate future specialists to continue in their study by having an insightful overview of operations research.

CO5 To demonstrate the cohesiveness of operations research methodology.

MBA-302 CORPORATE LEGAL ENVIRONMENT (CLE)

Course Objectives

The goal of this course is to acquaint the students with corporate legal framework prevailing in the India. Through a multi-faceted curriculum, students will learn to understand and appreciate the interrelationship between law and business, so as to enable them to analyze legal problems, recognize how law influences business and management decision making in these areas, and improve their management skills when faced with legal issues.

Course Outcomes

After the completion of the course student will able to:

- CO1 Acquire a sound understanding of the legal aspects of various laws affecting businesses and apply basic principles of law to various problems which business faces.
- CO2 Develop an understanding of Sale of Goods Act, various negotiable instruments, Insurance Laws and Law relating to Carriers.
- CO3 Explain and apply the fundamental Principles of Company Law.
- CO4 Develop basic understanding of Direct tax and Indirect Tax Laws i.e.GST

MBA -922MANAGEMENT OF FINANCIAL SERVICES (MFS)

Course Objectives

- 1. This course aims to expose the students to various types of financial services in the Indian financial system.
- 2. The course aims to provide in-depth knowledge of the mechanism underlying financial services viz; money market, leasing, merchant banking, factoring, mutual funds, insurance, credit rating, venture capital, etc.
- 3. To make the students aware about actual scenario of various financial services, impediments to growth of these services and future scope of these services.

- CO1 To make student understand the role, scope and growing contribution of financial services in the service sector of the economy.
- CO2 Student will be able to comprehend the role of online depository system, dematerialization and re-materialization of the securities.
- CO3 Student will define the role, types of mutual funds and comutaption of NAV
- CO4 Student will know the impact and role of Credit rating in the corporate world language.
- CO5 Student will analyze the contribution of leasing, merchant banks and venture capital in the promotion of the business.
- CO6 Student will understand the benefits of Plastic Money, Factoring and forfeiting and debt securitization.

MBA-921 SUBJECT; SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT (SAPM)

Course 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

Course Outcomes

CO1: Understand the basic structure and working of primary and secondary financial markets in India and conversant with computation of risk and return measures for financial instruments.

CO2: Understand secondary market trading

CO3: Understand and appreciate the Fundamental and Technical analysis tools for analyzing financial securities.

CO4: Well versed with the concept of a Portfolio and understand the principle portfolio theories.

CO5: Acquaint and understand portfolio analysis, portfolio evaluation and portfolio revision techniques.

CO6: Understand the basic concept of Derivates.

MBA 961SOCIAL SECURITY & LABOUR WELFARE

Course Objectives

To acquaint the students with basic Acts pertaining to social security and labour welfare as applicable in India.

- CO1 Students will have sufficient knowledge of basic Acts pertaining to labour welfare as applicable in India.
- CO2 Students will have sufficient knowledge of basic Acts pertaining to social security as applicable in India.

MBA-962 TRAINING & DEVELOPMENT

Course Objective

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

Course Outcomes

CO1 The historical and theoretical basis of organisation design and development and their context in terms of value and contribution to organisational life.

CO2 Available design options regarding organisational structures and relationships. The importance of the HR role in advising on design and development choices and supporting their implementation.

CO3 Develop, analyze and apply advanced training strategies and specifications for the delivery of training programs and evaluate training programs using appropriate design and data collection procedure.

MBA 901 – CONSUMER BEHAVIOUR

Course Objectives

1. The objective of this course is to help the students to understand the various factors effecting consumer behaviour and the process of consumer buying.

2. This course will provide understanding of consumer behaviour and the students are expected to design the strategy.

Course Outcomes

CO1 Understand the consumer behavior and its role in the corporate world.

CO2 Apply the knowledge about individual determinants of consumer behavior

CO3 Analyze the external influences on consumer behavior.

CO4 Illustrate the consumer decision making process.

MBA 4th Sem

MBA401-18CORPORATE STRATEGY

Course Objective: This course aims to familiarize the students with organization perspective from strategic viewpoint integrating different functional areas of management. The aim is to develop an understanding of how organizational strategies are formulated and implemented in a changing global environment.

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

MBA 923-18INTEGRATED MARKETING COMMUNICATION AND SALES MANAGEMENT

Course Objective: This course will help the students to understand the principles and practices of marketing communication, tools used by marketers to inform consumers and to provide a managerial framework for integrated marketing communications planning as well as sales management.

Course Outcomes: After successfully completing this course, students will be able to:

CO1: Apply the key terms, definitions, and concepts used in integrated marketing communications.

CO2: Conduct and evaluate marketing research and apply these findings to develop competitive IMC Programme.

CO3: Examine the role of various promotional strategies such as advertising, direct marketing, sales promotion and PR in effectiveness of marketing communication.

CO4: Understand and apply the concepts of sales management and organization.

CO5: Develop sales related marketing policies such as product policies, distribution policies & pricing policies.

CO6: Explain various sales operations such as sales budget, sales territories, sales Quota's, control of sales, sales meeting and sales contest, organizing display, showroom and exhibition.
MBA 924-18RETAIL MANAGEMENT

Course Objectives: This course enables students to understand the evolution of retailing and the strategic role of retailing in the distribution of consumer goods and services. The content of the course is useful for students interested in a retail career, working for companies that interface with retailers, or interested in owning or running a retail business.

Course Outcomes: After studying this course, the students should be able to:

CO1: Understand opportunities and challenges in retail management and retail management decision process.

CO2: Examine various types of retail formats and comprehend the application of theories of retail development on business models in retail.

CO3: Discuss and apply various function of store management.

CO4: Recognize the importance of store design and apply the concepts of store design to determine store layout and merchandising.

CO5: Understand the importance of customer service in improving retail service qualities.

CO6: Describe the applications of IT in retailing.

MBA 925-18INTERNATIONAL AND SOCIAL MEDIA MARKETING

Course 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. The course also helps students to understand the basics in Social Media Marketing and Blogging.

Course Outcomes: After successfully completing this course, students will be able to:

CO1: Assess the challenges in international marketing and understand various international market entry strategies.

CO2: Evaluate international marketing environment and identify various international trade barriers and regional blocks.

CO3: Develop international product, pricing and communication policy and examine international distribution system.

CO4: Discuss the evolution of social media marketing and identify various benefits and applications of social media.

CO5: Explain how to develop effective social media marketing strategies for various types of industries and businesses.

CO6: Describe the major social media marketing portals that can be used to promote a company, brand, product, service or person.

MBA 926-18PRODUCT AND BRAND MANAGEMENT

Course Objective: To create understanding among students for concepts, process, techniques of product and management. The course also aims to familiarize students with the concept of a 'brand', the role of branding in marketing strategy; brand equity, its importance and measurement, how to create and retain brand equity; operational aspects of brand management.

Course Outcomes: After studying this course, the students should be able to:

CO1: Understand what a product is, the various levels which make it up, and different types of products. CO2: Examine various challenges and issues involved in product planning and development.

CO3: Discuss and apply the concepts of test marketing and market entry of a product.

CO4: Recognize the features and importance of a brand and conduct branding research.

CO5: Understand the concept of brand loyalty and measuring brand performance.

CO6: Describe the role of various branding strategies in brand equity management.

MBA 913-18BEHAVIOURAL FINANCE

Course Objective: The primary objective of the course is to make the students understand how behavioural bias affects the classical financial theory.

Course Outcomes: After studying this course, the students should be able to:

CO1: Understand and differentiate between different theories of behavioural finance.

CO2: Examine the concepts of bounded rationality.

CO3: Discuss various anomalies in the market giving rise to behavioral bias.

CO4: Describe the basis of behavioral bias of professional investors trading in market.

CO5: Understand the concept of market efficiency and will be able to relate it with the concept of behavioral finance.

CO6: Describe the challenges to the efficient market hypothesis.

MBA 914-18MERGERS, ACQUISITIONS AND CORPORATE RESTRUCTURING

COURSE OBJECTIVE: The main objective of this course is to enable the students to understand, evaluate, and interpret the significance of Mergers, Acquisitions and Corporate Restructuring in the current global business environment, and enable them to appreciate how these strategic decisions are affected by various issues like valuation, regulatory environment and methods of payment.

Course Outcomes:

1) To explain the popularity of merger and acquisition strategies in firms competing in the global economy.

2) To describe the reasons why firms use an acquisition strategy to achieve strategic competitiveness.

3) To describe the issues that are significant in valuation decisions, and the factors which work against achieving success when using an acquisition strategy.

4) To define the restructuring strategy and distinguish among its common forms.

5) To explain the regulatory aspects of mergers, acquisitions and corporate restructuring

MBA 915-18INTERNATIONAL FINANCE AND FINANCIAL DERIVATIVES

Course Objective: The primary objective of the course is to familiarize the students with the different aspects of finance in respect of international trading and investing and to equip them with the trading framework of different types of derivative contracts.

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 trading strategies using options contracts.

CO6: Describe the regulatory framework of derivatives contracts in India.

MBA 916-18TAXATION AND PERSONAL FINANCIAL PLANNING

Course Objective - To enable the students to understand the importance of tax management and various methods available for tax planning. This course also aims to acquaint students with the importance and methods for personal financial planning.

Course Outcomes:

CO1 – The students will be familiarised with the concepts of tax management, tax avoidance and tax evasion and the methods of ways of tax planning.

CO2 – To acquaint students with the provision of the current finance act with regard to various head of income.

CO3 – To enable students to compute the tax liability of individuals after considering their residential status, various exempted incomes, permissible deduction, clubbing of income and setting off of losses.

CO4 – To familiarise students with the concept, objectives and importance of personal financial planning and enable the students to understand the implications of environmental factors and time value of money on the personal financial statements.

CO5 - To enable students to identify various types of risks any individual is exposed to and how they can hedge diversifiable risk.

CO6 – To familiarise students with various instruments available for investment by an individual for achieving their personal financial goals

MBA 933-18 INTERNATIONAL HUMAN RESOURCE MANAGEMENT

Course Objective: This course provides an understanding of the role of human resource management (HRM) in international contexts. The course is divided into three areas of study: the context of international HRM, strategic and functional HRM in international contexts, and comparative international contexts.

Course Outcomes:

CO1: Understand issues, opportunities and challenges pertaining to international HRM.

CO2: Develop competency in dealing with cross cultural situations.

CO3: Understand the strategic and functional roles of HRM in various international contexts, especially in areas such as recruitment and selection, performance management, training, learning and development, career management, compensation, motivation and repatriation;

CO4: Identify the role of cross cultural leadership in managing multicultural teams.

CO5: Understand external forces (e.g.globalisation, sociocultural changes, political and economic changes) that have the potential to shape international HRM.

CO6: Develop generic and transferable skills-especially in diagnosing international HRM issues critically and analytically and discussing specific cases relating to international HRM.

MBA 934-18 STRATEGIC HUMAN RESOURCE MANAGEMENT

Course Objective: The aim of this course is to help students to understanding the strategic approach to human resources as distinguished from the traditional functional approach, understanding the relationship of HR strategy with overall corporate strategy, strategic role of specific HR systems and appreciating SHRM in the context of changing form of organizations in the global environment.

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

CO1: Understand an integrated approach to the development of HR strategies that enable the organization to achieve its goals.

CO2: Describe the process of strategic HRM.

CO3: Discuss the strategic role of HR systems such as strategic staffing, strategic appraisal, strategic reward system etc.

CO4: Explain various human aspects of strategy implementation.

CO5: Identify the role of leadership in implementing strategic change.

CO6: Understand Global HRM and role of global HRM in successful implementation of MNC strategy

MBA 935-18

Course Objective: This course is designed to be an interactive exploration of team dynamics and leadership. Through the introduction of current theories and models, students will learn to work effectively in groups, increase their understanding of leadership, make effective decisions, and stimulate the development of new skills through demonstration and practice.

Course Outcomes:

CO1: Understand the history of leadership and current leadership theories.

CO2: Explain how leadership models are put into practice personally, locally, and globally.

CO3: Discuss the knowledge of developing leadership abilities.

CO4: Describe the concept of Strategic Leadership and ethical leadership.

CO5: Explain composition, formation, and development of teams.

CO6: Illustrate the dynamics of team Performance and motivation and the role of leadership in dynamics of team management and decision making.

MBA 936-18

Course Objective: The objective of the course is to impart relevant knowledge required to perform the functions of human resource planning in an organisation and equipping seekers with comprehensive and practical skills to manage employees' performance effectively, and to understand the structure and components of wages and salaries, and the wage administration in India

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

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

CO2: Identify the negative aspects of appraisal systems and consider how these might be overcome.

CO3: Discuss performance with regard to pay awards, and whether these should, or should not be automatically related to each other.

CO4: Demonstrate a familiarity with the appeal process relating specifically to the performance review.

CO5: Illustrate different ways to strengthen the pay-for-performance link and also learn the concepts of Payment and employee benefits issues for contingent workers.

CO6: Develop appropriate reward and compensation policies.

MBA 943 – 18

Course Objective: The objective of this paper is to acquaint the students with major issues and techniques of Managing Software Projects. Understanding approaches for managing and optimizing the software development process and choosing an appropriate project development methodology (e.g. waterfall, spiral, agile etc.). Applying efficient techniques for managing each phase of the systems development lifecycle

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

CO1: Understanding approaches for managing and optimizing the software development process

CO2: Examine contemporary software life cycle processes, activities and work products

CO3: Apply different methods to identify, analyze, and manage software project risks

CO4: Estimate software project effort, cost, and schedule for an intermediate size project

CO5: To make aware about the various software project teams in terms of roles and responsibilities and managers can plan their projects and minutely work out the cost and time overrun of projects.

MBA 944 – 18 MANAGING DIGITAL INNOVATION AND TRANSFORMATION

Objective: The objective of this paper is to acquaint the students with introduction to digital transformations and innovation and build Digital Capabilities.

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

CO1: Identify how Digital Transformation impacts corporate strategies

CO2: Understand Security Issues in Digital Transformations

CO3: Understand the risk associated with evolving international clients and environment

CO4: To learn Security Issues, Methods & Laws CO5 :Understanding cloud computing

CO5:Understanding cloud computing

MBA 945 – 18

Course Objective: The objective of this paper is to acquaint the students with role of IT Consulting in Business Processes. It shall enable them to understand Consulting Life Cycle, Consulting Projects, Service Level Agreements (SLA) and Ethics in Consulting.

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

CO1: To analyze the IT requirements of the organization and the underlying environment.

CO2: Toadvise IT solutions and services based on requirements.

CO3: To understand RFP Analysis.

CO4: To provide an understanding about SLA.

CO5: To familiar with ethics in consulting

MBA 946 – 18 STRATEGIC MANAGEMENT OF IT

Objective: The objective of this paper is to acquaint the students with the value of IT in strategic management and its processes. This course is designed to explore an organisation's vision, mission, examine principles, techniques and models of organisational and environmental analysis, discuss the theory and practice of strategy formulation and implementation such as corporate governance and business ethics for the development of effective strategic leadership through the use of IT.

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

CO1: To develop an understanding of strategic management concepts and techniques and acquire the ability to apply the same in business situations

CO2: Learning how to use IT as a tool to implement business strategies and gain competitive advantage, not merely to support business operations.

CO3: In addition to familiarizing students with new technological changes in management, students are expected to integrate and apply their prior learning to strategic decision making in organisations

CO4: Integrate and apply knowledge gained in basic courses to the formulation and implementation of strategy from holistic and multi-functional perspectives.

CO5: Analyze and evaluate critically real life company situations and develop creative solutions, using a strategic management perspective.

MBA953-18 SUPPLY CHAIN & LOGISTIC MANAGEMENT

Course Objective: To make students understand about the growing recognition that the twin goals of cost reduction and service enhancement can be achieved through logistics and supply chain management.

CO1: Demonstrate a clear understanding of the key concepts applied in logistics and supply chain management.

CO2: To highlight the importance of all activities of the supply chain and an understanding of concepts like inbound and outbound logistics, offshore and inshore logistics.

CO3: To develop skills for planning, designing the operational facilities of supply chain with the analytical and critical understanding.

MBA954-18 QUALITY TOOLKIT FOR MANAGERS

Course Objective: The course aims at giving an insight to students about a well-designed quality management system, that will help in identification of problems and help improve output quality to better meet the changing market scenario.

CO1: Evaluate the principles of quality management and to explain how these principles can be applied within quality management systems.

CO2: To provide students with the requisite knowledge of concepts and to impart practical skills and techniques required in the area of strategies for managing technology in business

CO3: Critically appraise the organizational, communication and teamwork requirements for effective quality management

CO4: Critically analyze the strategic issues in quality management, including current issues and developments, and to devise and evaluate quality implementation plans.

MBA 963-18 DATA VISUALIZATION FOR MANAGERS

Objective: The objective of this paper is to acquaint the students with Visualization Imperative like Message to Charts and Visual Perception. Also help students discover the power of storytelling and the way to make data an essential idea to enhance business as manager.

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

CO1: Employ best practices in data visualization to develop charts, maps, tables, and other visual representations of data.

CO2: Use Tableau's visualization tools to conduct data analysis, especially exploration of an unfamiliar dataset.

CO3: Create compelling, interactive dashboards to combine several visualizations into a cohesive and functional whole.

CO4: Utilize advanced Tableau features including parameters, data blending, custom SQL, very large datasets, custom date hierarchies, and others.

CO5: Use data visualizations, dashboards and Tableau Stories to support relevant communication for diverse audiences.

MBA 964-18 BUSINESS FORECASTING

Objective: The objective of this paper is to acquaint the students with Forecasting Process, Exploratory Data and Regression Analysis. Students should learn Time Series Forecasting Models.

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

CO1: Understand the importance of forecasting in making accurate decisions in economic and business environments

CO2: Understand the basics in regression analysis, time series analysis and their applications in forecasting

CO3: Understand how to handle the trend, seasonal and cyclical issues in forecasting analysis.

CO4: Construct forecasting reports to higher level management for vital decision-making process.

CO5: Use the software packages for developing forecasting models.

CO6: Be prepared for more advanced study of economic and business forecasting

MBA 403-18 WORKSHOP ON INDIAN ETHOS

Course Objective: The course is an attempt for the students to learn about how to apply the concepts and theories of ancient Indian management in business.

Courses Outcomes:

CO1: Comprehend and practice Indian Ethos and values system.

CO2: Applying value-based management and ethical practices in business.

CO3: To gain the knowledge of management principles from Vedas and other holy books and explain the application of Indian heritage in business.

CO4: To comprehend various stress management techniques and their applications in organizations. CO5: To describe salient features and advantages of ancient Indian system of learning. CO6: To describe various laws of Karma and explain the concept of corporate karma

2.6.1 Program Outcomes, program specific outcomes and courseoutcomes for the program B. Tech. (ECE)

PROGRAM OUTCOMES (PO's)

After the successful completion of undergraduate course, Electronics & Communication Engineering, Graduates will be able to:

PO-1: Apply the knowledge of Mathematics, Science and Engineering fundamentals to solve complex problems related to Electronics, Communication Engineering and Information Technology.

PO-2: Identify, formulate & review research literature and analyze complex Electronics, Communication Engineering and Information Technology problems.

PO-3 Design solutions for complex Electronics, Communication Engineering and Information Technology problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety and cultural and social considerations.

PO-4 Design and conduct experiments, as well as to analyze and interpret data.

PO-5 Apply appropriate techniques, resources and modern engineering & IT tools for computing practice.

PO-6: Analyze the local and global impact of computing on individuals, organizations and society.

PO-7 Knowledge of contemporary issues to understand the impact of engineering solutions in a global. economic, environmental, and societal context.

PO-8 An understanding of professional, ethical, legal, security and social issues and responsibilities. PO-9 An ability to function effectively individually and on teams, including diverse and multidisciplinary, to accomplish a common goal.

PO-10 An ability to communicate effectively with engineering community and society at large.

PO-11 An understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects.

PO-12 Recognize of the need for and an ability to engage in continuing professional development.

PROGRAMME SPECIFIC OUTCOMES (PSO's)

PSO-1 Apply the knowledge of Mathematics, Science and Engineering fundamentals to solve problems related to Electronics, Communication and allied Engineering fields.

PSO-2 Identify, formulate & review research literature and analyze complex Electronics, Communication Engineering and allied engineering fields.

DAV Institute of Engineering & Technology Department of ECE

COURSE OUTCOMES

Batch 2017

Upon successful completion of this course, the student will intend to apply the various outcome as::

BTEC-301, Analog Devices & Circuits

This course aims to expose the students to the principles of Analog Devices and basic circuits to acquaint beginners to various Technical concepts, in the core of **Design**, Implementation, Research& Invention of various Electronic Systems.

BTEC-302, Digital Circuits and Logic Design

CO1:-Students will be able to represent numerical values in various number systems and perform number conversions between different number systems.

CO2:-Students will demonstrate the knowledge of:

- operation of logic gates (AND, OR, NAND, NOR, XOR, XNOR) using IEEE/ANSI standard symbols
- Boolean algebra including algebraic manipulation/simplification, and application of DeMorgan's theorems
- Karnaugh map reduction method.

CO3:-Students will demonstrate the knowledge of operation of basic types of flip-flops, registers, counters, decoders, encoders, multiplexers, and de-multiplexers.

CO4:-Students will be able to analyze and design digital combinational circuits including arithmetic circuits (half adder, full adder, multiplier).

BTEC-303, Network Analysis & Synthesis

1) The student gain skills on analysis of electrical networks using complex frequency approach and Laplace transform. The student is capable of applying such approaches to two port networks.

2) Students can perform mathematical transformations to describe the behavior of networks which are

represented using differential equations.

2

3) Students are able to perform reduction of the circuit; they develop an ability to choose an appropriate analytical method.

BTCS-305, Object Oriented Programming using C++

- 1) Gain knowledge on basics of object oriented programming.
- 2) Understand template, file handling, exception handling concepts.

BTEE-402, Linear Control Systems

- 1) Apply systems theory to complex real world problems in order to obtain models that are expressed using differential equations, transfer functions
- 2) Predict system behavior based on the mathematical model of that system where the model may be expressed in time or frequency domain
- 3) Analyze the behavior of closed loop systems using tools such as root locus, Routh Hurwitz, Bode and Nyquist criteria.

BTEC-401, Analog Communication Systems

- 1) To develop the concept of analog communication System.
- 2) To understand different types of noise and predict its effect on various analog communication systems
- 3) To design the major building blocks of communication system

BTEC-402, Signals & Systems

- 1) Classify signals and systems and perform operations like folding, shifting, scaling etc. on them.
- 2) Apply Fourier series and Fourier transform to represent continuous and discrete time signals.
- Solve and apply DTFT and Z transform to analyze linear time invariant discrete time system:
- 4) Explain the behavior of random signals in terms of probability functions

BTEC-403, Electromagnetics & Antenna

- 1) Recognize the need of electromagnetic wave theory including the Maxwell equations in different form, Waveguides and Transmission Lines analogy with waveguide. .
- 2) Explain the various type of antennas and application in the field of communication engineering.
- 3) Aware of different wave propagation including free space equation, Surface and Space wave propagation and ionosphere propagation

BTEC-404, Electronics Measurement & Instrumentation

- 1) Identify electronics/ electrical instruments, their use, peculiar errors associated with the instruments and how to minimize such errors. 2) Explain the industrial and laboratory applications of such instruments.
- 3) Understand the basic design techniques of electronic equipments.

BTEC-405, Pulse Wave Shaping & Swtching

- 1) The students will be able to know the applications of clipping and clamping circuits in
- 2) The students will be able to design multivibrators for various purposes. 3) The students will be able to understand the basic swithching concepts and their applications to

BTCS-304, Computer Networks

- 1) Students will be able to understand basic networking concepts.
- 2) Students will be able to compare the data link protocols and networking layer protocols.
- 3) Students are able to design new protocols for data link layer and routing algorithms. 4) Students must understand the concept of interworking after going through this course.

BTEC-501, Digital Communication Systems

- 1) Analyze the performance of a baseband and pass band digital communication system in terms of error rate and spectral efficiency.
- 2) Perform the time and frequency domain analysis of the signals in a digital communication system.
- 3) Select the blocks in a design of digital communication system.
- 4) Analyze Performance of spread spectrum communication system.

BTEC-502, Digital Signal Processing

- 1) Apply the concept of discrete time signals and various manipulations on them.
- 2) Analyze the Discrete time system using Z-transform and Discrete Fourier Transform
- 3) Learn and understand realizations of various forms of structures' for discrete time systems
- 4) Develop the capability to design FIR and IIR filters depending upon the specific application
- 5) Analyze the effects of finite word length on filter performance
- 6) Describe the architecture and characteristics of digital signal processors.

BTEC-502, Linear Integrated Circuits

1) Students will be able to understand the basic concepts of Linear Integrated Circuits.

- 2) Students will be able to **apply** the knowledge of operational amplifiers and design various op-amp circuits.
- 3) Students will be able to able to complete accurate and comprehensive analysis of Linear Integrated Circuits.
- 4) Students will be able to demonstrate the working of various circuits using 741C and 555 ICs

BTEC-504, Microprocessor & Microcontrollers

- To understand the detailed architecture of 8085-microprocessor & 8051 microcontrollers.
 The students will be able to apply the knowledge of addressing modes and instruction sets for
- writing assembly language programmes for problem solving.
- 3) The students will be able to compare microprocessors and microcontrollers.
- 4) The students will be able to demonstrate the interfacing of various peripheral devices to microcontroller and design of interfacing systems.

BTEC-601, Microwave & Radar Engineering

- 1) The students will be able to know the basics of Microwave Range and its advantages and disadvantages.
- 2) They will be able to understand the importance of various microwave components
- 3) They will be able to measure various microwave parameters to judge the performance of the Microwave systems.

BTEC-602, VLSI Design

- 1) To understand mathematical methods and circuit analysis models in analysis of CMOS digital electronics circuits, including logic components and their interconnect.
- 2) To create models of moderately sized CMOS circuits that realizes specified digital functions.
- 3) To apply CMOS technology-specific layout rules in the placement and routing of transistors

and interconnect, and to verify the functionality, timing, power, and parasitic effects.

BTEC-701 Embedded Systems

- 1) Get insight of design metrics of Embedded systems to design real time applications to match recent trends in technology.
- 2) Understand Real time systems concepts.
- 3) Apply interfacing of devices using LPC2148

BTEC-702 Optical Communication Systems

1)The students will **learn** the need of optical communication system with basic knowledge to elements of optical fiber transmission link, fiber modes configurations and structures

2)The student will understand the different kind of losses, signal distortion in optical wave guides

and other signal degradation Factors

3) The student will become skilled at the various optical source materials, LED & Laser structures, quantum efficiency of optical source as well as photo detector, fiber optical receivers such as PIN, APD diodes, noise performance in photo detector, receiver Operation and configuration

4)The student will gain knowledge of the fiber optical network components, variety of optical communication system & network aspects

BTEC-912 Speech & Image Processing

- 1) After studying this course, the students will be able to understand the basics of image and speech processing
- 2) Students will be able to analyze image tools on image enhancement, segmentation and color image models.
- 3) Students will conceptualize the basics of speech production, speech synthesis, music theory and filters used for practical applications.

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution are stated and displayed on website and communicated to teachers and students

Vision of Institute:

"To attain the coveted status of a growth- oriented resources of national importance known for quality professional education, research and innovation."

Mission of the Institute:

"To provide professional education with a difference confirming a confluence of inter multidisciplinary knowledge domains; targeting excellence in collaboration with industry; promoting creative competence and innovation aimed at producing skilled human resource and entrepreneurs; sustaining Indian ethics and moral values."

Vision of the Department:

"To emerge as a center of excellence in civil Engineering Education and research & consultancy upholding professional ethics and social values

Mission of the Department:

- M1. To provide an intellectually challenging, yet supportive and welcoming environment, that encourages and enables our students, faculty and staff to achieve their best in teaching, learning and research.
- M2: To create, disseminate and integrate knowledge of engineering, science and technology into our civil engineering knowledge base towards enabling the betterment of human society and improving civil engineering practice.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

The educational objectives developed by the Department for its undergraduate program reflect our commitment to providing a program that produces graduates who, within five years of graduation will be able:

- **PEO-1:** To apply technical expertise, effective design skills, and sustainability principles to address evolving engineering challenges affecting a diverse society
- **PEO-2:** To contribute effectively and ethically as a member, manager or leader of multidisciplinary teams through efficient communication of technical and nontechnical issues
- **PEO-3:** Continue to learn and adapt to an evolving professional environment.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: The programme graduates will apply knowledge of mathematics and physical sciences to analyze and solve the problems in core areas of civil engineering such as structural engineering, geotechnical engineering, environmental engineering and surveying.

PSO2: The programme graduates will design a system, component or process in structural, geotechnical and environmental engineering to meet desired needs within realistic constraints such as, economic, environmental, social, health and safety, and sustainability.

PSO3: The programme graduates will function and communicate effectively in a multidisciplinary team environment, and implement principles of project management with an understanding of professional and ethical responsibility.

PROGRAMME OUTCOMES (POs)

POs: The Civil Engineering Student Outcomes require that graduates perusing a B.Tech degree from DAVIET demonstrate the following.

PO1: Graduates will apply the knowledge of mathematics, science, and engineering fundamentals to provide the solution to the civil engg problems.

PO2: Graduates will analyze and interpret data to identify / formulate problems through critical thinking and familiarity with the computational procedure essential to the field.

PO3: Graduates will design a system, component, or process to meet desired needs within realistic constraints such as economic, social, ethical, health and safety.

PO4: Graduates will function effectively as an individual and as a member or leader in multi disciplinary team.

PO5: Graduates will understand the impact of engineering solutions in societal and environmental context and apply the knowledge for sustainable development.

PO6: Graduates will apply ethical principles and commit to professional ethics and responsibilities during engineering practice.

PO7: Graduates will communicate effectively with the Engineering community and society at large.

PO8: Graduates will demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team.

PO9: Graduates will recognize the need for, and the ability to engage in life-long learning in the context of technological change.

PO10: Graduates will use the appropriate techniques, resources, and tools for modern engineering practice.

PO11: Use research based knowledge and methods to provide valid conclusions and sustainable solutions to complex problems.

PO12: Apply reasoning through contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

DAV Institute of Engineering & Technology

Department of Civil Engineering

Course Outcomes Upon successful completion of this course, the student will intend to apply the various outcome as:

Fluid Mechanics-I BTCE - 301

Course Outcomes:

After studying the course the students of Civil Engineering will be competent:-

- 1. To apply the knowledge of the basic principles of fluid mechanics for analysis and design of type of flow regime in a given engineering system, to construct an appropriate (fixed, deforming, or moving) control volume for a given engineering system and apply the principles of conservation of mass, momentum, and energy to the control volume.
- 2. Ability to calculate the hydrostatic forces and moments on planar and curved submerged and floating surfaces to analyze fluid flow problems with the application of the momentum and energy equations.
- 3. Ability to present data or governing equations in non-dimensional form, design experiments, and perform model studies and to decide when appropriate to use ideal flow concepts and the Bernoulli equation.
- 4. Ability to solve for internal flow in pipes and channels through simple solutions of the Navier-Stokes equations, Moody chart and head-loss equations.
- 5. Ability to solve for external flow, evaluate lift and drag, know when there is possibility of flow separation, apply streamlining concepts for drag reduction by using experimental correlations.
- 6. An understanding of how fluid mechanics applies to mechanical, biological and environmental systems.

Rock Mechanics & Engineering Geology

BTCE-302

Course Outcomes

- 1. Students will be able to critically review the importance of Engg. Geology and their applications to Civil Engineering practices.
- 2. Students will be able to identify and classify common minerals and rocks using basic geological classification system.
- 3. Students will be able to know about Geological structures (Joint, veins, crack, faults, and fold), reasons of formation for each type and their side effects on the engineering projects.
- 4. Students will be able to know the characteristics of earthquake and measures taken to construct structures like tunnels, highways, dams etc. in rocks.

- 5. Students will be able to determine physical and mechanical properties of rock in term of density, porosity, permeability, and hardness.
- 6. Students will have knowledge of Field and laboratory test procedures and be able to interpret test results needed to estimate intact and rock mass properties.
- 7. Students will be to identify problems in rock mass and able to provide improvement in the properties of rock mass.
- 8. Students will be able to understand the role of Geology in the design and construction process of underground opening in Rock.
- 9. Students will be able to apply geological concepts and approaches on rock engineering projects.

Strength of Materials BTCE-303

Course Outcomes

Students should understand and be able to implement:

- 1. Concepts of free body diagrams of structures and to check stability (Beams and frames)
- 2. Concepts of stress and strain of axially loaded members, mechanical and thermal properties.
- 3. Concepts of shear force and bending moment diagrams of different beams with different loading conditions and relation between loads, shear force and bending moment.
- 4. Concepts of straight beams, bending stress of beams, flitched beams, shear stress formula for beams and shear stress distribution in beams.
- 5. Concepts of crippling load of an axially loaded column under different end conditions.
- 6. Concepts of torsion and failure theories.

Surveying BTCE-304

Course Outcomes

Students will be able to:

- 1. Understand the principles and objective of surveying.
- 2. Calculate the horizontal distance on plane and sloping surface.
- 3. Do angular and elevation measurements with different types of equipments.
- 4. Analyse the closed traverse and will be able to balance it.
- 5. Design simple circular curves for horizontal and vertical alignments.
- 6. Plot the topographical map of an area.

Building Materials and Construction BTCE-305

Course Outcomes

On completion of the course, the students will be able to:

- 1. Students will have sufficient knowledge of materials in construction
- 2. Students will be able to design the concrete mixes according to the situations
- 3. Students will have sufficient knowledge to think critically in terms of achieving the

goals

of "Shelter for all".

4. Students will have knowledge of the revolutionary materials in constructions

Geomatics Engineering BTCE-401

Course Outcomes

Students must be able to:

- 1. Get a brief idea about history of Photogrammetry and its advancement in the field of surveying
- 2. To aware students the different methods of survey measurements using EDM
- 3. To aware students to different types of Total station and make them able to use it in field.
- 4. To aware students the different components, uses, and operations involved in Remote Sensing
- 5. To introduce the concept of GIS, Its different Components and application in the field of Civil Engineering field.
- 6. To aware students to different types of GPS Recivers.

Construction Machinery and Works Management BTCE 402

Course Outcomes

On completion of the course, the students will be able to:

CO1. Design the bar charts and milestone charts for residential construction buildinigs.

CO2. Apply the PERT and CPM techniques to the various complex civil engineering projects

CO3. Solve the optimistic time and minimum cost for the various projects by applying various methods.

CO4. Design and use the different construction machinery in order to get the maximum output.

CO5. Understand the operations of concrete batching and bitumen plants.

DESIGN OF CONCRETE STRUCTURES -1 BTCE-403

Course Outcomes

Students will be able to:

- 1. Identify and utilize the cement, steel, aggregates and admixtures to obtain the desired reinforced cement concrete.
- 2. Prepare concrete mixture having desired properties and assess its quality in fresh and hardened state using Indian standard methods.
- 3. Analyze a reinforced concrete member under flexure, shear and torsion using limit state design philosophy.
- 4. Design the reinforced concrete beams and slabs using limit state design guidelines of Indian standards.
- 5. Access the structural safety and serviceability of reinforced concrete beams and slabs as per Indian standards for Limit state design.

STRUCTURAL ANALYSIS-I BTCE- 406

Course Outcomes

After the completion of the course the student will be able to

- Differentiate between determinate and indeterminate structures.
- Evaluate deflections in structures using various methods. (Beams, frames and trusses)
- Examine the causes for additional stresses in arches, trusses and cables.
- Draw ILD for various forces in determinate structural systems

DESIGN OF STEEL STRUCTURES -1 BTCE-501

Course Outcomes

Students will be able to:

- 1. Recognize the properties of structural steel and permissible stresses under different types of loading conditions as per Indian standards for limit state design.
- 2. Estimate safe load carrying capacity and efficiency of different steel fasteners like rivets, bolts & welds.
- 3. Select safe and economical steel sections for different structural members under various loading/stress conditions.
- 4. Analyse forces and stresses in tension, compression, flexural members and roof truss members of structural steel.
- 5. Design steel structural members i.e. ties, struts, beams, columns, bases, roof trusses, other associated components and connections under different conditions of limit states.
- 6. Evaluate structural safety, stability and economy of various steel structural members to achieve sustainability.

Geotechnical Engineering BTCE - 502

Course Outcomes

On completion of the course, the students will be able to:

- 1. Comprehend the various geotechnical field challenges and understand their fundamental properties and then use (apply) the soil as an engineering material.
- 2. Apply the various specifications of compaction of soils in the construction of highways and earthen dams.
- 3. Able to apply the knowledge of consolidation, soil deformation parameters, and calculate settlement magnitude and rate of settlement.
- 4. Investigate and write the laboratory reports for soil design properties and parameters by apply the concept of total and effective stress approaches in soil strength determination
- 5. Design the embankment slopes and check the stability of finite slopes.

STRUCTURAL ANALYSIS-II BTCE-503

Course Outcomes

After the completion of the course the student will be able to:

- 1. Identify determinate and indeterminate structures and compute the indeterminacies of those structures.
- 2. Predict the response of structures ((Beams, frames and trusses) in terms of bending moments, shear forces and displacements using classical methods.
- 3. Apply methods for analysis to indeterminate structures i.e. conventional methods and approximate methods to various structures.
- 4. Understand the causes of additional stresses in beams, arches, trusses & frames and draw the ILD of various force quantities.
- 5. Suggest suitable method for analysis of different types of multi-storeyed frames.

Environment Engineering-I BTCE-505

Course Outcomes

Students will be able to:

- 1. Understand the different water demands their estimation and forecasting.
- 2. Understand sources of water and their development.
- 3. Analyze water quality parameters.
- 4. Understand and design water treatment processes.
- 5. Design Water conveyance systems.
- 6. Develop and design drinking water system for rural areas

Design of Concrete Structures-2 BTCE 601

Course Outcomes:

Students will be able to:

- 1. Analyze and Design different types of R.C.C Stair Case.
- 2. Analyze and Design different types of R.C.C Foundation Systems.
- 3. Analyze and Design different types of R.C.C Compression Members.
- 4. Analyze and Design different types of R.C.C Continuous and Curved Beams.
- 5. Analyze and Design different types of R.C.C Domes.
- 6. Analyze and Design different types of Water Tanks.

Elements of Earthquake Engineering BTCE 602

Course Outcomes

After the completion of the course the student will be able to:

1. Understand the phenomenon of occurrence and history of earthquakes and classify their kinds and effects.

2. Recognize source and types of structural vibrations.

3. Evaluate and analyze Degree of Freedom, Spring action, Damping, Equations of motions, Lateral Force analysis, Floor Diaphragm action, Moment resisting frames and Shear walls.

4. Design structure for seismic forces having adequate Lateral Strength, Stiffness, ductility.

5. Appraise and implement provisions of IS 13920 and IS 4326.

FOUNDATION ENGINEERING BTCE-603

Course Outcomes

Upon successful completion of this course, it is expected that students will be able to:

- 1. Apply fundamental concept of mathematics, statics and mechanics to understand the essentials of the methods of soil exploration stability analysis.
- 2. Analyse and design a variety of geotechnical engineering structures including foundations, piles, retaining walls, slopes and interpret data.
- **3.** Recognize behavior of soils in slopes, behind retaining structures and phenomena affecting foundation capacity and settlement.
- **4.** Determine allowable bearing pressures and load carrying capabilities of different foundation systems.
- 5. Evaluate appropriate bearing capacity correction factors and apply related equations in design. Evaluate effects of water and layered soil systems on foundation performance.
- 6. Identify the appropriate deep foundation type for different soil profiles.
- 7. Specify pile material types for various applications and calculate side/tip capacity of driven piles in clay.

Fluid Mechanics Lab

BTCE-307-18

Course Outcome

- 1 Select appropriate pressure measuring device under different condition of flow.
- 2 Determine the stability of a floating body.
- 3 Understand and apply Bernoulli's theorem practically.
- 4 Find discharge of fluid through pipe, orifices and in open channel.
- 5 Estimate the major and minor losses in pipe.
- 6 Estimate the various elements and energy losses in hydraulic jump.

Solid Mechanics Lab

BTCE-308-18

Course Outcomes

- 1. Understand the importance of physical properties of steel.
- 2. Identify and comprehend code provisions for testing different properties of steel.
- 3. Develop stress-strain curve for axial compression, axial tension and shear.
- 4. Assess hardness and impact strength of steel.
- 5. Assess flexural strength of a given material.
- 6. Evaluate fatigue and impact strength of steel.
Concrete Testing Lab

BTCE-406-18

Course Outcomes

- 1. Evaluate properties of building materials, such as cement and aggregates.
- 2. Conduct experiments and check the acceptance criteria (if any).
- 3. Design concrete mixes as per BIS provisions.
- 4. Analyze the properties of concrete in fresh and hardened state.
- 5. Create a well organized document and present the results appropriately.
- 6. Understand and apply non destructive testing (NDT) for evaluating concrete quality.

Transportation Lab

BTCE-407-18

Course Outcomes After completing this course the student must demonstrate the knowledge and ability to:

1. Characterize the pavement materials as per the Indian Standard guidelines.

2. Evaluate the strength of subgrade soil by CBR test.

3.Conduct experiments to evaluate aggregate properties.

4.Determine properties of bitumen material and mixes

5. Evaluate the pavement condition by rough meter and Benkelman beam test.

6.Create a well organized report and present the results appropriately.

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution are stated and displayed on website and communicated to teachers and students

Engineering Physics BTPH 101 COURSE OUTCOMES

After the completion of the course the student will be able to:

CO1: understand the importance of Applied Physics in describing the physical phenomena.

CO2: employ the knowledge of crystallography and X-Rays to understand the structure-property relationship of materials.

CO3: implement the concept of Theory of relativity and Quantum mechanics for research applications.

CO4: recognize the use of Laser, Magnetic materials, Superconductors and optical fibers in various fields.

CO5: acquire Basic knowledge of EMFT in communication and Nanophysics for its applications in the field of medicine, data storage devices and electronics.

Engineering Mathematics-I BTAM 101 COURSE OUTCOMES

After Successful completion of the course the students are expected to:

CO1: apply differential and integral calculus to evaluate definite, improper, multiple integrals and its applications.

CO2: deal with functions of several variables that are essential in most branches of engineering.

CO3: develop their attitude towards problem solving.

CO4: enhance multi-dimensional skills namely problem defining analysis, logic development, path making for solutions and selecting appropriate techniques of solution.

CO5: introduce basics of curve tracing and fitting which is helpful for students for making forecasts in the data based on theoretical distributions.

Communicative English BTHU 101 COURSE OUTCOMES

After Successful completion of the course the students are expected to:

CO1: become the independent users of English language.

CO2: acquire basic proficiency in reading & listening, comprehension, writing and speaking skills.

CO3: understand spoken and written English language, particularly the language of their chosen technical field.

CO4: able to converse fluently.

CO5: produce on their own clear and coherent texts.

Basic Electrical and Electronics Engineering BTEE 101 COURSE OUTCOMES

After Successful completion of the course the students are expected to:

CO1: predict the behavior of any electrical and magnetic circuits.

CO2: identify the type of electrical machine used for that particular application.

CO3: acquire knowledge about basics of digital electronics.

CO4: understand various methods of electrical generation.

CO5: identify schematic symbols and understand the working principles of electronic devices.

Environmental Science EVSC 101 COURSE OUTCOMES

After the completion of the course the student will be able to:

CO1: develop critical thinking skills in relation to environmental affairs.

CO2: acquire knowledge about natural resources and their effective management.

CO3: expand awareness of self in a global society and effectively engage diverse perspectives, values, and cultures, ranging from local to global, in dealing with environmental and social issues.

CO4: interpret and propose solutions to various environmental pollution.

CO5: formulate an action plan for sustainable alternatives that integrate science, humanist, and social perspectives.

Engineering Physics Laboratory BTPH 102 COURSE OUTCOMES

After the completion of the course the student will be able to:

CO1: develop skills to impart practical knowledge in real time solutions.

CO2: understand principle, concept, working and application of new technology and comparison of results with theoretical calculations.

CO3: design new experiments/instruments with practical knowledge.

CO4: gain knowledge of new concept in the solution of practical oriented problems and to understand more deep knowledge about the solution to theoretical problems.

CO5: understand measurement technology, usage of new instruments and real time applications in engineering studies.

Communication Skills Laboratory BTHU 102 COURSE OUTCOMES

After Successful completion of the course the students are expected to:

CO1: become the independent users of English language.

CO2: acquire basic proficiency in reading & listening, comprehension, writing and speaking skills. **CO3:** understand spoken and written English language, particularly the language of their chosen technical field.

CO4: able to converse fluently.

CO5: produce on their own clear and coherent texts.

Basic Electrical and Electronics Engineering Laboratory BTEE 102 COURSE OUTCOMES

After Successful completion of the course the students are expected to:

CO1: get an exposure to common electrical components and their ratings.

CO2: make electrical connections by wires of appropriate ratings.

CO3: understand the usage of common electrical measuring instruments.

CO4: understand the basic characteristics of transformers and electrical machines.

CO5: get an exposure to the working of power electronic converters.

Manufacturing Practice BTMP 101 COURSE OUTCOMES

Upon completion of this course, the students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials

Engineering Chemistry BTCH 101 COURSE OUTCOMES

After the completion of the course, the learner will be able to:

CO1: analyze the need, design and perform a set of experiments.

CO2: identify the structure of unknown/new compounds with the help of spectroscopy.

CO3: differentiate hard and soft water, solve the related numerical problems on water purification and its significance in industry and daily life.

CO4: apply the principles of green chemistry in designing alternative reaction methodologies to minimize hazards and environmental degradation.

CO5: understand the causes of corrosion, its consequences and methods to minimize corrosion to improve industrial designs.

CO6: explain the properties, separation techniques of natural gas and crude oil along with potential applications and role of petrochemicals in national economy.

CO7: acquire Basic knowledge of Nano chemistry to appreciate its applications in the field of medicine, data storage devices and electronics.

CO8: equipped with basic knowledge of polymer reinforced composites, applications of semiconductor photochemistry in energy harnessing and optical sensors.

Engineering Mathematics-II BTAM 102 COURSE OUTCOMES

After Successful completion of the course the students will be able to:

CO1: study the convergence of sequence and series and to apply different tests of convergence.

CO2: study the essential tool of matrices and linear algebra in a comprehensive manner.

CO3: develop their attitude towards problem solving.

CO4: understand the tools of solving functions of complex variables that are used in various techniques dealing with engineering problems.

CO5: understand the effective mathematical tools for the solutions of differential equations that model physical processes.

Elements of Mechanical Engineering BTME 101 COURSE OUTCOMES

In the vast spectrum of Mechanical Engineering, this subject gives a very primitive but general information finding vide application in day to day life with emphasis upon the principles and fundamentals involved in the inter-conversion of thermal energy into mechanical energy and vice versa, viz. all Automobile, Air-Craft, Generator and other stationary Heat Engines besides cooling machinery like Refrigerators, Air-Conditioners and water-coolers etc. The subject also offers a birds eye-view to all students about the common engineering materials finding vide application in Mechanical Engineering. Industry and about their strength and other related vital aspects. Since every student of engineering is already exposed to all afore-said machinery, he/she would feel very much self-satisfied and self-confident after learning the basic intricacies and whys and how related with the fundamentals of the aforesaid machinery.

Fundamentals of Computer Programming and IT BTCS 101 COURSE OUTCOMES

After Successful completion of the course the students will be able to:

CO1: understand the basic building blocks of general purpose digital computer system like computer hardware/software, memory and peripheral devices, internet applications and services.

CO2: understand the program development life cycle using various tools like flowcharts and algorithms and pseudo-code.

CO3: classify operators, expressions, character set, data types and control structures.

CO4: understand the concept of modular programming and code reusability using library functions.

CO5: write programs using object oriented concepts like classes and objects, file handling.

Human values and Professional ethicsHVPE 101COURSE OUTCOMES

After the completion of the course the student will be able to:

CO1: recognize what is valuable to human being and what are the basic aspirations of life.

CO2: understand the importance of mutually satisfying human behavior and enriching interaction with nature.

CO3:develop appropriate technologies and management patterns to create harmony in Nature/Existence

CO4: implement the understanding of value education in solving the various practical problems of professional and personal life.

CO5: acquire basic knowledge of harmony in existence and to understand existence as coexistence.

Engineering Chemistry Laboratory BTCH 102 COURSE OUTCOMES

After the completion of the course the student will be able to:

CO1: analyze & generate experimental skills.

CO2: enhance the thinking capabilities in the modern trends in Engineering & Technology.

CO3: learn and apply basic techniques used in chemistry laboratory for preparation, purification and identification

CO4: employ the basic techniques used in chemistry laboratory for analyses such as Chromatography, Spectroscopy, Volumetric titrations, Conductometric, Pensky-Martens apparatus and Stalagmometer.

CO5: learn safety rules in the practice of laboratory investigations.

Engineering Drawing

BTME 102 COURSE OUTCOMES

After the completion of the course the student will be able to:

CO1: prepare and understand drawings.

CO2: use the principles of orthographic projections.

CO3: by studying about projections of solids, students will be able to visualize three dimensional objects and that will enable them to design new products.

CO4: design and fabricate surfaces of different shapes.

CO5: represent the objects in three dimensional appearances.

Fundamentals of Computer Programming and IT BTCS 102 COURSE OUTCOMES

After the completion of the course the student will be able to:

CO1: explain basic operations performed by the computer system along with its internal /external structure and input /output devices.

CO2: operate various types of OS specifically GUI.

CO3: examine and categorize various types of memories.

CO4: use utility programs such as MS office, internet explorer etc.

CO5: understand and implement high-level programming in c concepts such as control structure , structures , union and file systems.

Engineering Computer Graphics Laboratory BTME 103 COURSE OUTCOMES

After the completion of the course the student will be able to:

CO1: prepare and understand drawings.

CO2: use the principles of orthographic projections.

CO3: by studying about projections of solids, students will be able to visualize three dimensional objects and that will enable them to design new products.

CO4: design and fabricate surfaces of different shapes.

CO5: represent the objects in three dimensional appearances.

BTPH 101-18 Mechanics of Solids (Civil Engineering-I)

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

BTPH 111-18 Mechanics of Solids Lab (Civil Engineering-I)

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

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.

BTPH 102-18 Optics and Modern Physics (Electrical Engineering-I)

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

CO1: identify and illustrate physical concepts and terminology used in optics and other wave phenomena.

CO2: understand optical phenomenon, such as, interference, diffraction etc. in terms of wave model.

CO3: understand the importance of wave equation in nature and appreciate the mathematical formulation of the same.

CO4: appreciate the need for quantum mechanics, wave particle duality, uncertainty principle etc. and their applications.

CO5: understand some of the basic concepts in the physics of solids and semiconductors.

BTPH 112-18 Optics and Modern Physics Lab (Electrical Engineering-I)

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

CO1: verify some of the theoretical concepts learnt in the theory courses.

CO2: trained in carrying out precise measurements and handling sensitive equipment.

CO3: introduce 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.

BTPH 103-18 Electromagnetism (Mecanical Engineering-I)

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

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 pursue higher studies.

BTPH 113-18

Electromagnetism Lab (Mecanical Engineering-I)

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

CO1: able to verify some of the theoretical concepts learnt in the theory courses.

CO2: train 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.

BTPH 104-18

Semiconductor Physics (Computer Science Engineering/ Information Technology-I)

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

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.

BTPH 114-18

Semiconductor Physics Lab (Computer Science Engineering/ Information Technology-I)

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

CO1: able to verify some of the theoretical concepts learnt in the theory courses.

CO2: train in carrying out precise measurements and handling sensitive equipment.

CO3: introduce 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.

BTPH 105-18

Semiconductor and Optoelectronics Physics (Electronics and communication Engineering-I)

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

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.

BTPH 115-18

Semiconductor and Optoelectronics Physics Lab (Electronics and communication Engineering-I)

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

CO1: able to verify some of the theoretical concepts learnt in the theory courses.

CO2: train 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.

BTAM 101-18

Mathematics-I (Calculus & Linear Algebra) (Civil Engineering / Electrical Engineering/ Mechanical Engineering/ Electronics and communication Engineering-I)

Course Outcomes: The students will learn:

CO1: The fallouts of Rolle's Theorem that is fundamental to application of analysis to Engineering problems.

CO2: To apply differential and integral calculus to evaluate definite, improper integrals and its applications.

CO3: The convergence of sequence and series and to apply different tests of convergence

CO4: To deal with functions of several variables that are essential in most branches of engineering.

CO5: The essential tool of matrices and linear algebra in a comprehensive manner.

BTAM 104-18

Mathematics Paper-I (Computer Science Engineering/ Information Technology-I)

Course Outcomes: The students will be able

CO1: to apply differential and integral calculus to notions of curvature and to improper integrals. **CO2:** to have a basic understanding of Beta and Gamma functions.

CO3: to have the understanding of essential tools of matrices and linear algebra including linear transformations, eigen values, diagonalization and orthogonalization.

BTAM 201-18

Mathematics-II (Differential equations) (Civil Engineering-I)

Course Outcomes: The students will learn:

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.

BTAM 202-18

Mathematics-II (Differential Equations & Numerical Methods) (Electronics and communication Engineering /Electrical Engineering-I)

Course Outcomes: Students will be able to:

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.

BTAM 203-18

MATHEMATICS II (Ordinary Differential Equations and Complex Variable) (Mechanical Engineering-I)

Course Outcomes: The students will learn:

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.

BTAM 204-18

Mathematics Paper-II (Probability & Statistics) (Computer Science Engineering/ Information Technology-I)

Course Outcomes: The students will learn:

The ideas of probability and random variables and various discrete and continuous probability distributions and their properties. The basic ideas of statistics including measures of central tendency, correlation and regression and the statistical methods of studying data samples.

BTEE-101-18

Basic Electrical Engineering (Common for all branches)

Course Outcomes: Students will be able to:

CO1: understand and analyze basic electric and magnetic circuits

CO2: study the working principles of electrical machines and power converters.

CO3: introduce the components of low voltage electrical installations

BTEE-102-18

Basic Electrical Engineering Laboratory (Common for all branches)

Course Outcomes: Students will be able to:

CO1: get an exposure to common electrical components and their ratings.

CO2: make electrical connections by wires of appropriate ratings.

CO3: understand the usage of common electrical measuring instruments.

CO4: understand the basic characteristics of transformers and electrical machines.

CO5: get an exposure to the working of power electronic converters.

BTME101-18

Engineering Graphics & Design (Theory & Lab.) (Common for all branches)

Course Outcomes

All phases of manufacturing or construction require the conversion of new ideas and design concepts into the basic line language of graphics. Therefore, there are many areas (civil, mechanical, electrical, architectural and industrial) in which the skills of the CAD technicians play major roles in the design and development of new products or construction. Students prepare for actual work situations through practical training in a new state-of-the-art computer designed CAD laboratory using engineering software.

This course is designed to address:

CO1: to prepare you to design a system, component, or process to meet desired needs within realistic constraints such as economic, 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

BTCH101-18

Chemistry-I (Common for all branches)

Course Outcomes: The course will enable the student to:

CO1: analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.

CO2: rationalise bulk properties and processes using the thermodynamic considerations.

CO3: distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.

CO4: rationalize periodic properties such as ionization potential, electronegativity, oxidation states and electro negativity.

CO5: list major chemical reactions that are used in the synthesis of molecules.

BTCH 102-18 Chemistry Lab (Common for all branches)

Course Outcomes: After the completion of the course the student will be able to:

CO1: estimate rate constants of reactions from concentration of reactants/products as a function of time.

CO2: measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc.

CO3: synthesize a small drug molecule and analyze as alt sample

BTPS101-18 Programming for Problem Solving (Common for all branches)

Course Outcomes: The student will learn

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.

BTPS102-18 Programming for Problem Solving (Lab) (Common for all branches)

Laboratory Outcomes: The student will learn

CO1: to formulate the algorithms for simple problems

CO2: to translate given algorithms to a working and correct program

CO3: to be able to correct syntax errors as reported by the compilers

CO4: to be able to identify and correct logical errors encountered at run time

CO5: to be able to write iterative as well as recursive programs

CO6: to be able to represent data in arrays, strings and structures and manipulate them through a program

CO7: to be able to declare pointers of different types and use them in defining self referential structures.

CO8: to be able to create, read and write to and from simple text files.

BTMP101-18 (Theory and Lab) Workshop/Manufacturing Practices (Common for all branches)

Course Outcomes

Upon completion of this course, the students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.

Laboratory Outcomes

CO1: upon completion of this laboratory course, students will be able to fabricate components with their own hands.

CO2: they will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes.

CO3: by assembling different components, they will be able to produce small devices of their interest.

BTHU-101-18

English (Common for all branches)

After Successful completion of the course the students are expected to:

CO1: become the independent users of English language.

CO2: acquire basic proficiency in reading & listening, comprehension, writing and speaking skills.

CO3: to understand spoken and written English language, particularly the language of their chosen technical field.

CO4: able to converse fluently.

CO5: produce on their own clear and coherent texts.

BTHU-102-18

English Laboratory (Common for all branches)

Course Outcomes:

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 Educational Objective:

PEO 1: Their ability for a successful career in industries engaged in Mechanical and related engineering fields for solving real time problems maintaining ethical and moral values.

PEO 2: Their ability to shoulder managerial responsibilities and leadership positions resulting in creation of new entrepreneurs.

PEO 3: Effective technical communication, creativity and a commitment to continuing education aiming research for serving the community.

Program Specific Outcomes:

PSO 1: Able to apply learned principles in the various domains of manufacturing, design, thermal and fluid sciences to solve engineering problems utilizing conventional and modern technology.

PSO 2: Able to conceive and develop new ideas on product design and development with the help of modern tools.

PSO 3: Equipped with requisite managerial and technical skills for accomplishing efficient and safe industrial practices.

Program Outcomes:

PO1. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.
PO2. Identify, formulate, research literature, and analysis complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

PO4. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling to complex engineering activities, with an understanding of the limitations.

PO6. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.PO12. Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcomes :

BTME301-18 FLUID MECHANICS

Course Outcomes: After studying this course, students will be able to:

1. Understand the concept of fluids and their properties.

2. Apply the concept to solve the problems related to statics, dynamics and kinematics of fluids.

3. Use and apply dimensional analysis and similitude techniques to various physical fluid phenomena.

4. Distinguish various types of flows and learn flow measurement methods.

BTME302-18 THEORY OF MACHINES -I

Course Outcomes: After studying this course, students will be able to:

1. Understand constructional and working features of important machine elements.

2. Design belt, rope and chain drives for transmission of motion from one shaft to another.

3. Identify different Cam and follower pairs for different applications and construct cam profile for required follower motion.

4. Understand the function of brakes, dynamometers, flywheel and governors.

BTME303-18 MACHINE DRAWING

Course Outcomes: After studying this course; the student will be able to:

- 1. Read, draw and interpret the machine drawings and related parameters.
- 2. Use standards used in machine drawings of machine components and assemblies.
- 3. Learn the concept of limits, fits and tolerances in various mating parts.
- 4. Visualize and generate different views of a component in the assembly.
- 5. Use CAD tools for making drawings of machine components and assemblies.

BTME304-18 STRENGTH OF MATERIALS-I

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

1. Understand the concepts of stress and strain at a point, in the members subjected to axial, bending, torsional loads and temperature changes.

2. Determine principal stresses, maximum shearing stress and their angles, and the stresses acting on any arbitrary plane within a structural element.

3. Find bending moment and shear force over the span of various beams subjected to different kinds of loads.

4. Calculate load carrying capacity of columns and struts and their buckling strength. 5. Evaluate the slope and deflection of beams subjected to loads.

BTEC305-18 BASIC ELECTRONICS ENGINEERING

Course Objectives: The objective of this Course is to provide the students of B.Tech Mechanical Engineering with an introductory and broad treatment of the field of Electronics Engineering to facilitate better understanding of the basic Electronics devices.

Course Outcomes: After undergoing this course students will be able to

1. Understand construction of diodes and their rectifier applications.

- 2. Appreciate the construction and working bipolar junction transistors and MOSFETs.
- 3. Design Op-Amp IC based fundamental applications.
- 4. Comprehend working of basic elements of digital electronics and circuits.

BTME305-18 BASIC THERMODYNAMICS

Course Objectives: The course has been designed to cover the interconversion of heat energy into work energy and vice versa; balance of energy between the System and its Surroundings; to learn about the application of First and Second law to various thermodynamic Systems, to learn about gas power cycles and IC Engines, to learn about steam formation and its properties, to learn about vapor power cycles.

Course Outcomes:

1. Apply energy balance to Systems and Control Volumes in situations involving heat and work interactions.

- 2. Evaluate changes in thermodynamic properties of substances.
- 3. Evaluate performance of energy conversion devices.
- 4. Explain and apply various gas power and vapor power cycles.

BTME306-18 Strength of Material Lab Course Outcomes: After studying this course, students shall be able to:

1. Measure the various mechanical properties such as tensile and compressive strength, impact strength, torsion strength and fatigue strength and hardness of brittle and ductile materials.

2. Calculate load carrying capacity of long columns and their buckling strength.

BTME307-18 Theory of Machine (Lab)

Course Outcomes: After studying this course, students shall be able to:

1. Determine gyroscopic couple, balancing of rotating masses and Cam profile analysis.

2. Determine gear- train value of compound gear trains and epicyclic gear trains.

BTME308-18

Fluid Mechanics (Lab)

Course Outcomes: After studying this course, students shall be able to:

1. Distinguish various type of flows and flow measurement methods and concept of statics and dynamics of liquids.

2. Determine discharge and head loss, hydraulic and friction coefficient, for different types of flow in pipe and open channels.

BTME401-18 APPLIED THERMODYNAMICS

Course Outcomes: After studying this course, students will be able to:

1. Learn the functioning and performance evaluation of reciprocating air compressors.

2. Analyze the combustion phenomenon in boilers and I.C. engines.

3. Use of Steam Tables and MollierChart to solve vapour power cycle problems.

4. Explain the constructional features and working of steam power plants and to evaluate their performance.

BTME402-18 FLUID MACHINES

Course Outcomes: After studying this course, students shall be able to:

1. Recognize basic components of turbo machines and understand related fundamental laws/ principles and apply these for calculation of various parameters like work done, force efficiency etc. 2. Know about constructional details, working and design aspects of runner/wheel and evaluate the performance of various turbines like Pelton, Kaplan and Francis.

3. Know about constructional details, working and evaluate the performance of centrifugal pump under different vane shape conditions.

4. Know about constructional details, working and evaluate the performance of reciprocating pump and evaluate the effect of various deviations from the ideal conditions on the work done.

5. Know about constructional details and working of hydraulic devices like fluid coupling, accumulator and intensifier.

BTME403-18 STRENGTH OF MATERIALS II Course Outcomes: At the end of the course, the student will be able to:

1. Apply the basics to find stresses in various applications (shells, curved beams and rotating discs).

2. Analyse the change in dimensions of shells, curved beams and rotating discs under operation.

3. Determine stresses, deflection and energy stored in various kinds of springs subjected to load and twist.

4. Understand the concept of failure theories and strain energy.

5. Evaluate shearing stress variation in beams of different cross-section and materials.

BTME404-18 MATERIALS ENGINEERING Course Outcomes: After studying this course, students shall be able to:

1. Understand the significance of structure-property-correlation for engineering materials including ferrous and nonferrous.

2. Explain the use and importance of various heat treatment processes used for engineering materials and their practical applications.

3. Understand the various structural changes occurred in metals with respect to time temperature transformations.

4. Understand the significance of Fe-C and TTT diagram for controlling the desired structure and properties of the materials.

BTME405-18 THEORY OF MACHINES-II

Course Outcomes: After studying this course, students will be able to:

1. Understand the basic concepts of inertia forces & couples applied to reciprocating parts of a machine.

2. Understand balancing of rotating and reciprocating parts of machines.

3. Select suitable type of gears for different application and analyse the motion of different elements of gear trains.

4. Understand the concept and application of gyroscopic effect. 5. Gain knowledge of kinematic synthesis.

BTME406-18 Applied Thermodynamics (Lab)

Course Outcomes: After studying this course, students shall be able to:

1. Understand the construction and working of IC engines, and evaluate their performance.

2. Identify the various types of boilers & condensers.

BTME407-18 Fluid Machines (Lab)

Course Outcomes: After studying this course, students shall be able to:

1. Conduct experiments on scaled down models or on actual size hydraulic machines and evaluate results in terms of unit or specific quantities for comparison purpose.

2. Understand the working of various hydraulic machines (turbines and pumps) and can suggest remedial solutions for various faults.

BTME408-18 Material Engineering (Lab)

Course Outcomes: After studying this course, students shall be able to:

1. Analyse the microstructure of different ferrous and non-ferrous samples.

2. Explore the effect of heat treatment on various engineering materials by analysing its microstructure and hardness.

ENVIRONMENTAL STUDIES FOR B.TECH CIVIL, ELECTRONICS, ELECTRICAL ENGINEERING, MECHANICAL AND COMPUTER SCIENCE Course Outcomes:

1. Students will enable to understand environmental problems at local and national level through literature and general awareness.

2. The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who have done practical work on various environmental Issues.

3. The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate these problems.

4. Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world

BTME501-18 HEAT TRANSFER

Course objectives: To provide knowledge about application of conduction, convection and radiation heat transfer concepts to different practical applications Course Outcomes:

1. To teach students the basic principles of conduction, radiation, and convection heat transfer. Students will demonstrate an understanding of the basic concepts of conduction, radiation, and convection heat transfer.

2. To extend the basic principle of conservation of energy to systems that involve conduction, radiation, and heat transfer. Students will demonstrate an understanding of the concept of conservation of energy and its application to problems involving conduction, radiation, and/or convection heat transfer. This principle will be used to formulate appropriate mathematical models and associated thermal boundary conditions.

3. To train students to identify, formulate, and solve engineering problems involving conduction heat transfer. Students will demonstrate the ability to formulate practical conduction heat transfer problems by transforming the physical system into a mathematical model, selecting an appropriate solution technique, and evaluating the significance of results. 4. To train students to identify, formulate, and solve engineering problems involving forced convection heat transfer, natural convection heat transfer, and heat exchangers. Students will demonstrate the ability to formulate practical forced and natural conduction heat transfer problems by transforming the physical system into a mathematical model, selecting an appropriate solution technique, and evaluating the significance of results.

5. To train students to identify, formulate, and solve engineering problems involving radiation heat transfer among black surfaces and among diffuse gray surfaces. Students will demonstrate the ability to formulate practical radiation heat transfer problems by transforming the physical system into a mathematical model, selecting an appropriate solution technique, and evaluating the significance of results

BTME502-18 DESIGN OF MACHINE ELEMENTS

Course objectives:

To provide knowledge of design procedure for simple components like keys, cotters, fasteners, shafts, couplings, pipe joints and levers under static and fatigue loading. Objective of this course is to make the students capable of designing mechanical systems consisting of wide range of machine elements.

Course Outcomes:

After successfully completing this course, the students/learners will be able to:

1. Demonstrate recalling and applying knowledge of Basic Sciences, Graphics & Drawing, Basic Manufacturing Processes and Material Science, for design procedures of various Mechanical components.

2. Comprehend the effect of different stresses and strains under various loading conditions on the mechanical components and identify the mechanism/mode of failure.

3. Examine and solve design problems involving machine elements on the basis of various theories of failure.

4. Synergize forces, moments and strength information to develop ability to analyze, design and/or select machine elements aiming for safety, reliability, and sustainability.

BTME503-18 MANUFACTURING PROCESSES

Course objectives:

To motivate and challenge students to understand and develop an appreciation of the processes in correlation with material properties which change the shape, size and form of the raw materials into the desirable product by conventional or unconventional manufacturing methods.

Course Outcomes:

Upon completion of this course, students will be able to understand the different conventional and unconventional manufacturing methods employed for making different products.

BTME504-18

MANAGEMENT AND ENGINEERING ECONOMICS

Course objectives:

• Acquire knowledge of economics to facilitate the process of economic decision making • Acquire knowledge on basic management aspects

Course Outcomes:

On completion of this subject students will be able to

- 1. Explain the development of management and the role it plays at different levels in an organization.
- 2. Comprehend the process and role of effective planning, organizing and staffing for the development of an organization.
- 3. Understand the necessity of good leadership, communication and coordination for establishing effective control in an organization.
- 4. Understand engineering economics demand supply and its importance in economics decision making and problem solving.
- 5. Calculate present worth, annual worth and IRR for different alternatives in economic decision making.
- 6. Understand the procedure involved in estimation of cost for a simple component, product costing and depreciation, its methods.

BTME505-18 HEAT TRANSFER LAB.

Course objectives: To provide knowledge about application of conduction, convection and radiation heat transfer concepts to different practical applications Course Outcomes: After undergoing this course, students shall be able to:

- 1. Design and fabricate the experimental setups related to heat transfer phenomena.
- 2. Measure and analyse different heat transfer parameters.
- 3. Apply finite difference methods to solve simple heat transfer problems.

BTME506-18 MANUFACTURING PROCESSES

LAB Course Outcomes:

After studying this course, students shall be able to:

- 1. Determine/calculate the clay content, moisture content, hardness, permeability and grain fineness number of moulding sand sample
- 2. Use oxy-acetylene gas welding, manual arc welding, MIG, TIG and spot-welding processes to make various joints.
- 3. Use machine tools such as lathe, shaper and milling machine for machining/cutting various profiles on work pieces.
- 4. Learn about the constructional features and working of grinding machines, hydraulic press, draw bench, rolling mills, drawing and extrusion equipment.

BTME507-18 Numerical Method Lab

Course Objectives

This course provides understanding of implementations of basic numerical methods for solving different problems viz. nonlinear equations, system of equations, numerical integration and ordinary differential equations etc. The basic objective of this course is to develop capability of programming of numerical methods in the students so that they can develop and implement their own computer programs of the methods for solving different problems arising in science, engineering and technology etc.

Course Outcomes:

After completion of this course, the students will be able to:

- 1. Understand different implementation modes of numerical methods.
- 2. Use the numerical methods with the understanding of limitations of these methods for solving problems.
- 3. Develop and implement their own computer programs.
- 4. Solve problems more accurately and efficiently in low computational time.
- 5. Handle the problems conveniently which are difficult to deal with manually.

BTMC-102-18

Essence of Indian Traditional Knowledge

Course objective The course aims at imparting basis principals of thought process. Reasoning and inferencing Sustainability is at the core of Indian Traditional Knowledge Systems connecting society and nature. Holistic life style of yogic science and wisdom capsules in Sanskrit Literature are also important in modern society with rapid technological advancements and societal disruptions Part-1 focuses on introduction to Indian Knowledge System. Indian perspective of modern scientific world -view and basis principal of Yoga and holistic health care system.

BTME601-18 REFREGERATION AND AIR CONDITIONING

Course objectives:

To introduce the students, the basic refrigeration cycles of various refrigeration systems. To impart the students with basic understanding of and air conditioning systems for different

climatic seasons. To give the basic understanding of design aspects of RAC components such as evaporators, condensers, capillary tubes, expansion valve etc.

Course Outcomes: After undergoing this course, the student will:

- 1. Illustrate the fundamental principles and applications of refrigeration and air conditioning system
- 2. Obtain cooling capacity and coefficient of performance by conducting test on refrigeration systems.
- 3. Calculate the energy requirements of cooling and heat equipment for air conditioning applications.
- 4. Explain the properties, applications and environmental issues of different refrigerants. Demonstrate an ability to analysis psychrometric processes and cycles of air conditioning systems.

BTME602-18 MECHANICAL MEASURMENT AND METROLOGY

Course objectives:

1. To provide a knowledge about measurement systems and their components

2. To learn about various sensors and transducers used for measurement of mechanical quantities

3. To learn about usage of various measuring instruments

4. To learn metrology of screw, gear and surface texture Course outcomes:

After undergoing this course, the student will be able to:

1. Interpret characteristics of measuring instruments.

2. Describe various industrial metrological instruments for measuring linear, angular, screw thread and gear profiles.

3. Apply the fundamental principles for measurement of various mechanical quantities like Force/torque etc.

4. Develop an ability of problem solving and decision making by identifying and analysing the cause for variation and recommend suitable corrective actions for quality measurements.

BTME603-18 AUTOMOBILE ENGINEERING Course objectives:

- 1. To understand the construction and working principle of various parts of an automobile.
- 2. To have the practice for assembling and dismantling of engine parts and transmission system

Course Outcomes:

After undergoing this course the student will be able to:

1. Identify the different parts of the automobile.

2. Explain the working of various parts like engine, transmission, clutch, brakes, steering and the suspension systems.

3. Develop a strong base for understanding vehicle safety systems and future developments in the automobile industry.

BTME604-18 INTRODUCTION TO INDUSTRIAL MANAGEMENT

Course objectives:

• To help the students gain understanding of the functions and responsibilities of industrial managements.

1. To enable them to analyze and understand the environment of the organization.

- 2. To help the students to develop cognizance of the importance of management principles.
- 3. To provide them tools and techniques to be used in the performance of the managerial job.

Course Outcomes:

- 1. Understand the complexities associated with management in the organizations and integrate the learning in handling these complexities.
- 2. Demonstrate the roles, skills and functions of management.
- 3. Understand the concepts related to industrial management.

BTME605-18 REFREGERATION AND AIR CONDIITONING LAB

Course Outcomes:

1. Conduct and analyze the experimental data of performance of vapour compression refrigeration system in domestic refrigerator and water cooler.

2. Conduct and analyze the experimental data of performance of Electrolux Refrigerator.

3. Conduct the performance of window type room air conditioner and system.

4. Analyze the industrial set up for the working and use of vapour compression refrigeration system in cold storage.

Course Objectives:

To introduce the students for hand on practice to perform the experiment and evaluate the experimental record pertaining to refrigeration cycles of various refrigeration systems. To impart the students with training of interfacing the theoretical and practical skills. Refrigeration and Air Conditioning and its primary components such as evaporators, condensers, capillary tubes, expansion valve etc.

BTME606-18 MECHANICAL MEASUREMENT AND METROLOGY LAB The student will be able to:

1. Demonstrate the use of instruments for measuring linear (internal and external), angular dimensions and surface roughness.

2. Identify proper measuring instrument and know requirement of calibration, errors in measurement etc.

3. Apply analytical and experimental methods to make measurements and to find and correct defects in measurement systems.

BTME607-18 AUTOMOBILE ENGINEERING LAB The student will be able to:

1. Identify Construction, working, preventive maintenance, trouble shooting and diagnosis of various Automobile Systems.

2. Understand importance and features of different systems like axle, differential, brakes, steering, suspension, and balancing etc.

3. Identify Modern technology and safety measures used in Automotive Vehicles

BTME609-18 INTERNAL COMBUSION ENGINES

Course Outcomes: Students who have done this course will have

- 1. Knowledge about the basics of IC engines
- 2. Ability to evaluate operational characteristics of IC Engines

3. Ability to ascertain the effects of fuel/supply systems on emission from an engine.

4. Ability to test engine performance

BTME610-18 Mechatronics System

After successfully completing this course the students will be able to

CO1: Design mux, demux, flip-flops, and shift registers.

CO2: Describe the block diagram, registers, ALU, bus systems, timing & control signals, instruction cycles, and interrupts of 8085 microprocessors.

CO3: Apply the concept of 8085 microprocessor instruction sets and addressing modes in writing assembly language program for a given problem.

CO4: Describe the interfacing of memory, 8255 PPI, ADC, DAC, 7-segment LED system, stepper motor, 8251 and 8253 ICs with 8085 microprocessor

BTME611-18 MICROPROCESSOR IN AUTOMATION

Course objectives:

To introduce the basic concepts of Digital circuits, Microprocessor system and digital controller

Course outcomes:

Students who have done this course will have a good idea of the use of microprocessors for automation

BTME612-18 COMPOSITE MATERIALS

Course outcomes: Students who have studied this course will have

- 1. Understanding about the concept, need and applications of composite materials.
- 2. Ability to suggest/select optimum combination of Matrix/Reinforcement for various engineering applications.

3. Ability to analyze the effects of influencing factors on the strength of composite materials.

BTME613-18 COMPUTER AIDED DESIGN

Course outcomes: The students will be able to

- 1. Create the different wireframe primitives using parametric representations.
- 2. Create surface primitives using parametric modeling.
- 3. Create the different solid primitives using the different representation schemes.
- 4. Apply geometric transformations on the created wireframe, surface and solid models.

BTME614-18 PRODUCT DESIGN AND DEVELOPMENT

The student will be able to:

1. Understand desirable design aspects considering various production processes and also understand the economic factors of design.

2. Employ engineering, scientific, and mathematical principles to execute a design from concept to finished product

3. Apply the modern approaches to product design considering concurrent design, quality function deployment and various rapid prototyping methods.

4. Apply innovative process techniques in synthesizing information, problem-solving and critical thinking.

BTME615-18 NON-CONVENTIONAL ENERGY RESOURCES

Course outcomes:

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

- 1. Address smart energy and green infrastructure
- 2. Build models that simulate sustainable and renewable green technology systems
- 3. Understand the history, global, environmental and economic impacts of green technology
- 4. Address non-renewable energy challenges

BTME616-18 OPERATION RESEARCH

Course objectives:

The course is designed to understand the mathematical, engineering and modeling skills that may be useful for designing and solving complex industrial/social/economic problems using various optimization models like deterministic and probabilistic models, simulations, queuing theory, inventory model, replacements models and network models, etc.

Course outcomes: 1. Explain various mathematical deterministic operation research models.

- 2. Describe the problems of probabilistic and simulation models.
- 3. Demonstrate the queuing, inventory and replacement models etc.
- 4. Formulate and analyze the network models.

BTME617-18 MAINTENACE & RELIABILITY

Course objectives:

This course is designed to introduce basic concepts of maintenance and reliability to the students, to introduce various method of reliability analysis with real time problems with constraints and to make understanding the applications of Reliability and maintenance analysis for different types of systems.

Course outcomes:

1. Understand the concepts of reliability and maintainability

2. The students will be able to use statistical tools to characterise the reliability of an item and determine the reliability of a system, and will also understand the application of maintenance strategies in a manufacturing environment;

3. The students will develop ability in formulating suitable maintenance strategies to enhance system reliability of a manufacturing system

MECHANICAL VIBRATIONS (BTME701-18)

Course Outcomes

After completion of this course, the students will be able to

CO1: Formulate mathematical models of problems in vibrations using Newton's second law or energy principles

CO2: Understand the need and measurement of vibration in mechanical systems

CO3: Calculate principal modes of vibration

CO4: Explore the suitable methods of vibration reduction and absorption

CO5: Ability to determine vibratory responses of SDOF and MDOF systems

CO6: Create the mathematical model of a vibratory system to determine its response

AUTOMATION IN MANUFACTURING (BTME702-18)

Course Outcomes

After completion of this course, the students will be able to

CO1: Students should be able to design and implement automated systems using pneumatics.

CO2: Students should be able to provide hydraulic solutions for designing automated systems.

CO3: Students should be able to design and implement electro-pneumatic/hydraulic solutions for automated systems.

CO4: Students should be able to apply PLC programming and implement it on PLC kits. CO5: Students should be able to devise Assembly automated systems using feeders, orienteers and escapement devices Course Objectives: To understand the importance of automation and a thorough knowledge of its various elements such as sensors, pneumatics, hydraulics and CNC. Fundamentals of Management for Engineers (BTME703-18) Course Objectives: -

- 1. To understand the Management Concepts, applications of Concepts in Practical aspects of business and development of Managerial Skills for Engineers.
- 2. To help the students gain understanding of the functions and responsibilities of industrial managements.
- 3. To enable them to analyze and understand the environment of the organization.
- 4. To help the students to develop cognizance of the importance of management principles.
- 5. To provide them tools and techniques to be used in the performance of the managerial job.

Course Outcomes: -

- 1. The students understand the significance of Management in their Profession.
- 2. The various Management Functions like Planning, Organizing, Staffing, Leading, aspects are learnt in this course.
- 3. Understand the complexities associated with management in the organizations and integrate the learning in handling these complexities.
- 4. Demonstrate the roles, skills and functions of management.

Department of Computer Applications

The Programme Educational Objectives (PEO) of PG programmes are

PEO 1: To prepare post graduates who will be successful professionals in industry, government, academia, research, entrepreneurial pursuit and consulting firms and also will contribute to community as broadly educated, expressive, ethical and responsible citizens with proven expertise.

PEO2:To prepare post graduates who will achieve peer-recognition; as an individual or in a team; through demonstration of good analytical, design and implementation skills.

PEO3:To prepare post graduates who will thrive to pursue life-long learning to fulfil their goals

Programme Specific Outcomes

PSO1: Problem Solving & Analysis:

Apply the theoretical foundations of computer science in modelling and developing solutions to the real world problems.

PSO2: Software Development & Testing:

Design and develop the application software systems that meet the automation needs of society and industry.

PSO3: Network Communication and Applications:

Ability to apply knowledge of layered network Models, their protocols and technologies in building network and Internet based applications.

PO's (Graduate Attributes)

PO1: Computational Knowledge: Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.

PO2: Problem Analysis: Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.

PO3: Design / Development of Solutions: Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex Computing problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.

PO6: Professional Ethics: Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices.

PO7: Life-long Learning: Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.

PO8: Project management and finance: Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO9: Communication Efficacy: Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

PO10: Societal and Environmental Concern: Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices.

PO11: Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.

PO12: Innovation and Entrepreneurship: Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large

Course Outcomes:

Course Code: PGCA-B1 Course Name: Computer Programming using C

CO1 Express the logical flow used in Programming.

CO2 Design algorithms for solving various real life problems

CO3 Implement programs using C . CO4 Choose the right data type and statements for programs.

CO5 Explain various concepts of C programming language.

Course Code: PGCA-B2 Course Name: Computer Science Essentials CO1 Identify various components of computer system including input and output devices. CO2 Prepare documents using word processing, Spreadsheet and Presentation tools. CO3 Outline the key components of Database Management system CO4 Explain the role of operating system.

CO5 Define various components, modes and topologies of computer networks.

Course Code: PGCA1917 Course Name: Discrete Structures & Optimization

CO1 Explain the use of Venn diagrams to solve applied problems.

CO2 Apply rules of inference.

CO3 Write proofs using symbolic logic and Boolean Algebra

CO4 Applying elementary counting techniques using the product and sum rules,

permutations, combinations, the pigeon-hole principle.

CO5 Identify the type of graphs.

Course Code: PGCA1951 Course Name: Programming in Python

CO1 Explain environment, data types, operators used in Python.

CO2 Compare Python with other programming languages.

CO3 Outline the use of control structures and numerous native data types with their methods. CO4 Design user defined functions, modules, files, and packages and exception handling methods.

CO5 Write solutions for Object Oriented Programming Concepts.

Course Code: PGCA1952 Course Name: Advanced Data Structures

CO1 Choose appropriate data structures and algorithms and use it to design solution for a specific problem.

CO2 Execute the operations of hashing to retrieve data from data structure.

CO3 Design and analyze programming problem statements

CO4 Define proofs of correctness

CO5 Select algorithm design approaches in a problem specific manner.

Course Code: PGCA 1953 Course Name: Advanced Database Management System CO1 Express the basic concepts of DBMS and RDBMS.

CO2 Apply normalization theory to the normalization of a database

CO3 Explain Transaction Management & Recovery techniques in RDBMS.

CO4 Outline characteristics of advanced databases prevailing in market.

CO5 Demonstrate No SQL databases (Open Source)

Course Code:

PGCA1905 Course Name: Technical Communication

CO1 Outline the benefits of effective communication

CO2 Execute proficiency in reading & listening, comprehension, writing and speaking skills.

CO3 Apply spoken and written English language in their chosen technical field.

CO4 Illustrate fluency in conversation.

CO5 Write their own clear and coherent texts.

Course Code: PGCA1954 Course Name: Data Structures using Python Laboratory

CO1 Analyze various algorithms based on their time and space complexity.

CO2 Create different data structures in C/ C++

CO3 Implement various operations of all data structures

CO4 Illustrate the outcome of various operations with the help of examples.

CO5 Write programs to implement various types of searching and sorting algorithms

Course Code: PGCA1955 Course Name: Advanced Database Management System Laboratory

CO1 Implement query a database using SQL DML/DDL commands.

CO2 Analyse integrity constraints on a database

CO3 Develop PL/SQL programs including stored procedures, stored functions, cursors

CO4 Design new database and modify existing ones for new applications and reason about the efficiency of the result.

CO5 Execute the role of DBA.

Course Code: PGCA1908 Course Name: Technical Communication Laboratory

CO1 Demonstrate the benefits of effective communication

CO2 Execute proficiency in reading & listening, comprehension, writing and speaking skills. CO3 Apply spoken and written English language in their chosen technical field. CO4

Illustrate fluency in conversation.

CO5 Write their own clear and coherent texts.

Course Code: PGCA1909 Course Name: Web Technologies

CO1 Create pages with simple tags in HTML

CO2 Design webpages with multiple sections or frames

CO3 Explain how to link webpages through hypertext or images a links

CO4 Outline the key web designing concepts using java script

CO5 Design forms with special controls using HTML

Course Code: PGCA1920 Course Name: Design & Analysis of Algorithms

CO1 Define algorithm and its complexity

CO2 Categorize problems based on their characteristics and practical importance

CO3 Develop Algorithms using iterative/recursive approach

CO4 Design algorithm using an appropriate design paradigm for solving a given problem CO5 Categorize problems as P, NP or NP Complete

Course Code: PGCA1918 Course Name: Advanced Java

CO1 Explain the role of servlets

CO2 Select the right technology/ tool for problem based solutions.

CO3 Implement web concepts using java server pages

CO4 Implement database connectivity

CO5 Illustrate invocation of remote methods

Course Code: PGCA1956 Course Name: Linux Administration

CO1 Discuss the evolution of Open Source operating systems.

CO2 Prepare environment for working on open source operating system like Linux.

CO3 Perform resource management in Linux CO4 Write scripts in Linux.

CO5 Execute user level priviledges

Course Name: Information Security and Cyber Law

CO1 Identify issues involved in the field of information security.

CO2 Explain the key security requirements of Confidentiality, Integrity & Availability.

CO3 Demonstrate the concept of Intrusion Detection & Intrusion Prevention.

CO4 Apply Symmetric Encryption techniques. CO5 Describe the concept of Security policies and Cyber Laws.

Course Code: PGCA1914 Course Name: Web Technologies Laboratory

CO1 Design pages with simple tags in HTML

CO2 Create web pages with Audio and Video content in it.

CO3 Illustrate the movement from one web page to another

CO4 Implement advanced web designing concepts using java script

CO5 Execute a small web passed project for the benefit of society

Course Code: PGCA1922 Course Name: Advanced Java Laboratory

CO1 Implement servlets to handle HTTP requests

CO2 Demonstrate session and cookies management

CO3 Implement the concept of database management.

CO4 Outline the concept of SEO.

CO5 Create applications using advanced concepts like JavaBean, Struts, Hibernate, etc.

Course Code: PGCA1957 Course Name: Linux System Administration Laboratory

CO1 Prepare the environment for installation and use of Linux operating system

CO2 Write Shell Scripts

CO3 Implement C programs using gcc compiler

CO4 Implement virtualization

CO5 Execute commands related to granting and revoking user privileges.

Course Code: PGCA1925 Course Name: Advanced Computer Networking

CO1 Define computer networks CO2 Identify the role played by different layers of network model CO3 Outline the concept of Internet protocols and network security. CO4 Highlight the benefits of Adhoc networks CO5 Explain the protocols used in wireless communication systems

Course Code: PGCA1926 Course Name: Artificial Intelligence & Soft Computing

CO1 Highlight the significance of Artificial Intelligence in knowledge representation. CO2 Examine the useful search techniques; learn their advantages, disadvantages and comparison.

CO3 Explain 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.

Course Code: PGCA1927 Course Name: Theory of Computation

CO1 Define formal languages and automata.

CO2 Design Finite Automata's for different Regular Expressions and Languages.

CO3 Prepare context free grammar for various languages.

CO4 Illustrate how push down automata and Turing Machine can be used to solve computational problems.

CO5 Define complexity and computability concepts

Course Code:PGCA1928 Course Name: Advanced Computer Networking Laboratory

CO1 Demonstrate sharing of resources of network.

CO2 Prepare different types of network cables.

CO3 Write programs for simulating routing algorithms

CO4 Implement the configuration of Adhoc networks CO5 Execute configuration of wireless access points

Course Code: PGCA1929 Course Name: Artificial Intelligence & Soft Computing Laboratory

CO1 Write programs for basic AI problems.

CO2 Apply artificial neural networks and fuzzy logic theory for various problems.

CO3 Prepare training data.

CO4 Design back propagation network CO5 Implement different operations on fuzzy sets

Course Code: PGCA1930 Course Name: Software Project Management

CO1 Define the principal tasks of software project management

CO2 Outline the basic concepts of Software projects.

CO3 Explain the fundamentals of Process Planning, effort estimation and quality planning.

CO4 Comment upon risk and quality management.

CO5 Apply management and development practices to develop software.

Course Code: PGCA1971 Course Name: Optimization Techniques

CO1 Define the scope of operation research

CO2 Solve linear programming problems

CO3 Prepare feasible solutions for transportation and assignment problems

CO4 Outline the Project Management problems using CPM

CO5 Find solution to various optimization problems

Course Code: PGCA1972 Course Name: Data Mining and Business Intelligence

CO1 Highlight the need of Data Warehousing & Mining

CO2 Differentiate between the Transactional and Analytical data models.

CO3 Identify the real life applications where data mining can be applied.

CO4 Apply different data mining algorithms on wide range of data sets.

CO5 Comment on latest tools for data mining and big data analysis

Course Code: PGCA1973 Course Name: Enterprise Resource Planning

CO1 Define ERP & Related Technologies

CO2 Compare different types of ERP functional modules.

CO3 Explain Implementation Strategies of ERP

CO4 Discuss the latest trends and domains of ERP.

CO5 Analyze various case studies related to ERP implementation

Course Code: PGCA1933 Course Name: Mobile Application Development

CO1 Define framework of mobile application development

CO2 Comment upon the building blocks of mobile computing

CO3 Test the mobile applications CO4 Compare development environment of different operating systems for mobile application development.

CO5 Write programs for basic mobile applications

Course Code: PGCA1934 Course Name: Mobile Application Development Laboratory

CO1 Prepare environment for coding and running mobile applications

CO2 Develop mobile applications using GUI and Layouts

CO3 Develop mobile applications for different mobile operating systems.

CO4 Test Mobile Applications CO5 Implement database connectivity with mobile applications.

Course Code: PGCA1935 Course Name: Simulation & Modelling

CO1 Identify the paradigms and approaches used to design the simulation.

CO2 Compare different types of simulation, techniques and methods.

CO3 Apply concepts of computer simulation for types of inputs, system models, output behavior and performance estimation

CO4 Test the goodness of a simulation by analyzing the simulated data.

CO5 Highlight features of different simulation modeling software's

Course Code: PGCA1936 Course Name: Simulation & Modelling Laboratory

CO1 Use software tools for modelling and analysis of mathematical concepts for engineering application.

CO2 Simulate discrete problems using queuing systems.

CO3 Model and analyze simple engineering concepts and its importance in engineering applications.

CO4 Apply simulation software to construct and execute goal-driven system models. CO5 Create Simulation Projects

Course Code: PGCA1921 Course Name: E-Commerce & Digital Marketing

CO1 Discuss the scope of ecommerce.

CO2 Explain payment modes used in ecommerce today.

CO3 Execute a comprehensive digital marketing strategy and plan

CO4 Describe the use digital marketing for multiple goals within a larger marketing and/or media strategy.

CO5 List the major digital marketing channels.

Course Code: PGCA 1955 Course Name: e-Commerce and Digital Marketing Laboratory

CO1 Implement E-Commerce applications.

CO2 Develop digital marketing strategy and plan

CO3 Design effective digital and social media strategies

CO4 Discuss social, and security issues concerning the digital marketing and ecommerce.

CO5 Implement a project for E-Commerce and Digital Marketing

Course Code: PGCA1931 Course Name: Software Testing & Quality Assurance

CO1 Explain various approaches of software testing and quality assurance for software development.

CO2 Create test strategies, design test cases, prioritize and execute them.

CO3 Identify various risks involved with software projects and build risk management

CO4 Plan software management and configuration activities.

CO5 Dicuss the risk management involved in software development
Course Code: PGCA1956 Course Name: Software Testing & Quality Assurance Laboratory

CO1 Explain various approaches of software testing and quality assurance for software development.

CO2 Create test strategies, design test cases, prioritize and execute them.

CO3 Identify various risks involved with software projects and build risk management

CO4 Plan software management and configuration activities.

CO5 Dicuss the risk management involved in software development.

Course Code: PGCA1976 Course Name: Machine Learning and Data Analytics using Python

CO1 Explain Machine Learning concepts

CO2 Differentiate between supervised and unsupervised learning

CO3 Discuss clustering and classification algorithms

CO4 Analyse data using Python Numpy, Panda Libraries

CO5 Implement data visualization using matplotlib library of Python

Course Code: PGCA 1958 Course Name: Advanced Web Technologies

CO1 Explain client-side and server-side programming.

CO2 Discuss web data and XML document handling. CO3 Describe the role of AJAX.

CO4 Develop a dynamic webpage by the use of java PHP and MySQL.

CO5 Apply basic CRUD database operations in a Dynamic Website.

CO6 Discuss basic web services and their development.

Course Code: PGCA1977 Course Name: Machine Learning and Data Analytics using Python Laboratory

CO1 Develop knowledge of various learning models of data.

CO2 Implement a wide variety of learning algorithms.

CO3 Evaluate models generated from data.

CO4 Apply the algorithms to a real-world problems.

CO5 Optimize the models learned and report on the expected accuracy that can be achieved by applying the models.

Course Code: PGCA 1960 Course Name: Advanced Web Technologies Laboratory

CO1 Understand the advance concepts of website development.

CO2 Design dynamic web sites.

CO3 Implement database programming for web applications

CO4 Implement jQuery methods, AJAX, Bootstrap and REACT

CO5 Perform basic CRUD operations.

CO6 Develop market ready website, to be used by clients.

Course Code: PGCA1937 Course Name: Cloud Computing

CO1 Discuss the basic concept and importance of cloud computing.

CO2 Explain the process of migrating to a cloud solution for different applications.

CO3 Compare and evaluate the virtualization technologies.

CO4 Monitor and manage the cloud resources, applications and data while addressing the security concerns.

CO5 Use cloud solutions offered by industry leaders for various applications.

Course Code: PGCA 1938 Course Name: Cloud Computing Laboratory

CO1 Create applications for SaaS.

CO2 Develop cloud applications using popular cloud platforms.

CO3 Create virtual machines on the cloud.

CO4 Implement cloud storage management tasks. CO5 Develop private cloud

Course Code: PGCA1963 Course Name: Digital Image Processing

CO1 Discuss the need of various image transforms along with properties

CO2 Learn different techniques employed for the enhancement of images

CO3 Describe the rapid advances in Machine vision

CO4 Analyze images in multi resolution environment

CO5 Evaluate image compression techniques

Course Code: PGCA1964 Course Name: Digital Image Processing Laboratory

CO1 Implement the various operations which can be performed on images.

CO2 Apply filters on images as per the requirement

CO3 Implement different techniques employed for the enhancement of images

CO4 Implement image compression

CO5 Develop an Image Processing Application

Course Code: PGCA1965 Course Name: NLP and Speech Recognition

CO1 Discuss the fundamental concepts of natural language processing

CO2 Explain text normalization, use of edit distance, and regular expressions

CO3 Implement Naive bayes and sentiment classification algorithms

CO4 Familiarize with chatbots and phonetics

CO5 Describe the concept of speech recognition and text to speech conversion

Course Code: PGCA1966 Course Name: NLP and Speech Recognition Laboratory

CO1 Develop knowledge of various learning models of data.

CO2 Analyse performance of various learning algorithms.

CO3 Evaluate models generated from data.

CO4 Apply the algorithms to a real-world problems.

CO5 Optimize the models learned and report on the expected accuracy that can be achieved by applying the models.

Course Code: PGCA1967 Course Name: IOT & Blockchain Technology

CO1 Discuss the terminology and enabling technologies of IoT and Blockchain CO2 Identify various element of IoT.

CO3 Enumerate the steps involved in IoT system design methodology

CO4 Describe the working of bit coin crypto currency

CO5 List domain specific applications of IoT and Blockchain

Course Code: PGCA1968 Course Name: IOT & Blockchain Technology Laboratory

CO1 Use IoT sensors and remotely monitor data and control devices.

CO2 Develop real life IoT based projects.

CO3 Discuss blockchain technology and develop blockchain based solutions.

CO4 Deploy IoT based blockchain applications for on-premise and cloud based architecture.

CO5 Create docker based application

Department of Hotel Management

Program Outcome (PO's) Graduate of BHMCT Program will demonstrate:

PO1: Graduate will have knowledge of Operations in Hospitality Services Industry PO2: Graduate will be able to perform various tasks, duties and other activities in the operation of the hotels, restaurants, in accordance with the Standard Operating Procedures. PO3: Graduate will have the ability to analyse the situation or identifies problems, and be able to formulate a suitable solution & implement the same in Food & Beverage Service and accommodation operations.

PO4. Graduate will be able to demonstrate the ability to develop, examine, question, and explore perspectives or alternatives to problems in hospitality operations. PO5: Graduate will be able to use professional written and oral communication skills to communicate effectively. PO6: Graduate will be able to pursue entrepreneurial endeavours.

COURSE CODE: BHMCT-101

COURSE OBJECTIVES:

CO1. To develop understanding of basics of Food Production.

CO2. To develop ability to compare and illustrate various methods of cooking.

CO3. To gain understanding on Kitchen organisation structure and Food production.

CO4.Learner will able to explain the importance of basics of cooking

COURSE CODE: BHMCT-102 COURSE TITLE: FOOD PRODUCTION FOUNDATION I (PRACTICALS) (PART A)

Course Outcome

CO1.To be able to list and relate to kitchen equipment's and their handling.

CO2. To develop the ability to classify different vegetables along with the cuts.

CO3. Students will learn and compare various methods of cooking used in Food Production. CO4. Students will be able to apply the hands on learning to prepare various dishes.

COURSE CODE: BHMCT-103 COURSE TITLE: FOOD & BEVERAGE SERVICE

FOUNDATION I (THEORY) COURSE OUTCOMES:

CO1. Course inculcates knowledge about various food outlets and their characteristics. CO2. Students will be able to understand and explain various F&B equipment's and their usages.

CO3. To develop the ability to understand the intricacies in preparation of Restaurant operations.

CO4. Student will be able to classify and illustrate on food service principles and procedures

COURSE CODE: BHMCT-104 COURSE TITLE: FOOD & BEVERAGE SERVICE FOUNDATION I (PRACTICAL)

COURSE OUTCOME

CO1. Students will be able to List and name various Restaurant equipment's.

CO2. Students will practice basic service skills used in F&B Outlets.

CO3. Students will be able to learn how to setup the restaurant before service.

CO4. Student will be able to learn service of various non-alcoholic beverages.

COURSE CODE BHMCT – 105 COURSE TITLE FRONT OFFICE FOUNDATION I (THEORY) COURSE OUTCOME

CO1 To understand the work ethics towards customer care and satisfaction and its basic skills & knowledge of front office.

CO2 Students will be able to outline and explain hospitality industry and its importance. CO3 Students will be able to endorse classification of hotels & describe the most distinctive feature of each.

CO4 Student will be able to analyse, evaluate & discuss front office organization.

COURSE CODE: BHMCT – 106 COURSE TITLE: FRONT OFFICE FOUNDATION I (PRACTICAL'S)

Course OUTCOME

CO1 Students will be able to acquire the knowledge of basic front office operations. CO2 Students will be able to analyse, evaluate & learn working of subsections of front office. CO3 Students will be able to demonstrate reservation practices and luggage handling. CO4 They will gain knowledge about functioning of various equipment's of Front Office.

COURSE CODE: BHMCT-107 COURSE TITLE: ACCOMODATION OPERATIONS I (THEORY) COURSE OUTCOME:

CO1 Students will be able to acquire knowledge and learn about the significance of accommodation operation and its scope in the service industry.

CO2 Students will be able to practically perform various housekeeping operational functions. CO3 Students will enhance their professional skills, etiquette and learn to work in a team. CO4 To develop the handling of various cleaning equipment's and cleaning agents in a scientific and efficient manner.

COURSE CODE: BHMCT-108 COURSE TITLE: ACCOMODATION OPERATIONS I(PRACTICALS)

Course OUTCOME

CO1 Students will be able to identify different layout of room and amenities.

CO2 Students will be able to identify the cleaning equipment and cleaning agents and will be able to use in an appropriate & professional manner.

CO3 Students will be able to setup all necessary materials and equipment's required for cleaning.

CO4 To be able to demonstrate room cleaning as per standard operating procedures

AECC BTHU103/18 English:

Course Outcomes:

CO1 The objective of this course is to introduce students to the theory, fundamentals and tools of communication.

CO2 To develop in them vital communication skills which are integral to their personal, social and professional interactions

CO3 The syllabus shall address the issues relating to the Language of communication. CO4 To help the students become the independent users of English language.

AECCBTHU104/18 English Practical/Laboratory:

Course Outcomes:

CO1 The objective of this course is to introduce students to the theory, fundamentals and tools of communication.

CO2 To develop in them vital communication skills which are integral to their personal, social and professional interactions

CO3 The syllabus shall address the issues relating to the Language of communication. CO4 To help the students become the independent users of English language.

HVPE101-18 Ability Enhancement Compulsory Course (AECC) Human Values, Deaddiction and TrafficRules

Course Objective This introductory course input is intended

CO1 To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.

CO2 To facilitate the development of a Holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of Value based living in a natural way.

CO3 To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behaviour and mutually enriching interaction with Nature. CO4 this course is intended to provide a much needed orientational input in Value Education to the young enquiring minds.

HVPE102-18Ability Enhancement Compulsory Course (AECC)Human Values, Deaddiction and Traffic Rules (Lab/ Seminar)

Course Objectives

CO1 To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.

CO2 To facilitate the development of a Holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of Value based living in a natural way.

CO3 To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behaviour and mutually enriching interaction with Nature.

CO4 this course is intended to provide a much needed orientational input in Value Education to the young enquiring minds

COURSE CODE: BHMCT-201 COURSE TITLE: FOOD PRODUCTION FOUNDATION –II (THEORY)

COURSE OUTCOME:

CO1.Learners will be able to understand the usages of different spices, condiments & commodities used in Indian Cuisine.

CO2. To gain knowledge to develop Menu keeping in mind the importance.

CO3. To let students familiarize with various meats cuts and their use in Food Production.

CO4. Learners will be able to understand the usages of different types of ingredients in bakery & confectionary preparations

COURSE CODE: BHMCT-202 COURSE TITLE: FOOD PRODUCTION FOUNDATION-II (PRACTICAL) (PART A)

COURSE OUTCOME

CO1. Students will be able to identify various cuts of poultry and meat items, along with its preparation & uses.

CO2. Students will be able to experience the production of various types of Soups and Salads.

CO3. To practically prepare dishes from Indian cuisine along with dessert items.

CO4. Students will be able to practice the production of basic bakery & confectionary products such as breads, pastries & cakes.

COURSE CODE: BHMCT-203 COURSE TITLE: FOOD & BEVERAGE SERVICETION FOUNDA –II (THEORY)

COURSE OUTCOME:

CO1. Students will be able to enhance knowledge by learning about various types of food service techniques.

CO2. To gain expertise about the basics of Menu Planning.

CO3. Students will be able to undergo the process of In Room Dining.

CO4. To gain knowledge about the use and objective of Tobacco in Restaurant sector.

COURSE CODE: BHMCT-204 COURSE TITLE: FOOD & BEVERAGE SERVICE FOUNDATION-II (PRACTICAL)

COURSE OUTCOME

CO1. Students will be able to lay tables for different meals in Restaurant Operations.

CO2. Students will be confident to handle Guests during Restaurants Service.

CO3. To gain knowledge on various issues faced in the Food Service Industry and ways to resolve the same.

CO4. Students will be practically able to serve Cigars & Cigarettes.

COURSE CODE: BHMCT – 205 COURSE TITLE: FRONT OFFICE FOUNDATION II (THEORY)

COURSE OUTCOME:

CO1 Student will be able to understand the usage of Room tariff structure, fixation and various types of plan.

CO2 Student will know the process of guest cycle and reservation procedure & systems. CO3 Student will be able to develop knowledge of registration process and execute guest handling.

CO4 Student will acquire knowhow on various tasks in front desk function

COURSE CODE: BHMCT – 206 COURSE TITLE: FRONT OFFICEOUNDATION F-II (PRACTICALS)

COURSE OBUTCOME

CO1 Students will learn the basic process of welcoming Guests.

CO2 Students will be able to understand the preparation of various forms and formats used in front office.

CO3 Students will be able to learn, analyse and execute handling guest registration process. CO4 Students will be able to handle major Key related issues.

COURSE CODE: BHMCT-207 COURSE TITLE: ACCOMODATION OPERATIONS-II (THEORY)

COURSE OBJECTIVES:

CO1 Students will acquire knowledge about handling & usage of different cleaning agents. CO2 Students will be able to learn about the knowhow of various surface cleaning procedures.

CO3 Students will be able to learn how to fill various housekeeping forms and formats. CO4 Students will be able to understand the importance of Interdepartmental relations COURSE CODE: BHMCT208-18 COURSE TITLE: ACCOMODATION OPERATIONS-II (PRACTICALS) COURSE OUTCOME CO1 Students will be practically able to perform room cleaning and replenishing of guest supplies. CO2 Students will be able to understand the intricacies of bed making procedure. CO3 Students will have exposure on filling various forms and formats & their usage

Ability Enhancement Compulsory Course EVS102-18 Environmental Studies

Course Outcomes:

CO1 Students will enable to understand environmental problems at local and national level through literature and general awareness

CO2 The students will gain practical knowledge by visiting wild life areas, environmental institutes and various personalities who have done practical work on various environmental Issues.

CO3 The students will apply interdisciplinary approach to understand key environmental issues and critically analyse them to explore the possibilities to mitigate these problems CO4 Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world

COURSECODE: BHMCT301-18 - to BHMCT305-18 COURSETITLE: INDUSTRIAL TRAINING

COURSEOUTCOME:

CO1 The students will gain practical exposure in real life business activity under the supervision of industry experts.

CO2 They will also learn to co-relate theoretical knowledge with practical realities.

CO3 Students will manage to learn in teams whilst on Training at a Hotel

CO4 They will enhance their interpersonal skills while working in Industry

COURSE CODE: BHMCT401 – 18 COURSETITLE: INTRODUCTION TO INDIAN COOKERY(THEORY)

COURSEOUTCOME:

CO1 Students will be able to gain knowledge about the history & heritage of Indian Regional Cuisine

CO2 Students will have insight on various Regional Indian Cuisines

CO3 Students will acquire knowledge on Dum cooking and Tandoor Cooking

CO4 Students will be able to know the History and cooking of Indian Sweets

COURSE CODE: BHMCT402 – 18 COURSE TITLE: INTRODUCTION TO INDIAN COOKERY (PRACTICAL)

COURSEOUTCOME:

CO1 Students will have hands on experience of cooking of Various Indian Cuisines CO2 Students will acquire knowledge on cooking of different Gravies used in Indian Cuisine.

CO3 Students will be able to differentiate on cuisines of various parts of India. CO4 They will be also be able to get the knowhow of Different Indian Breakfast items.

COURSE CODE: BHMCT-403 – 18 COURSE TITLE: FOOD AND BEVERAGESERVICE OPERATIONS-II (THEORY)

COURSE OUTCOME:

CO1 Students will be able to acquire knowledge about different methods used in the Production of alcohol.

CO2 Students will be able to classify various Wines along with its production methods. CO3 They will be able to analyse the various types of alcoholic beverages used in Food & Beverage Service Industry. Students will get to know about Beer, its types, production and Storage

CO4 Students will acquaint themselves with various types of Cheese, its production, Brands and their Services

COURSE CODE: BHMCT404 – 18 COURSE TITLE: FOOD AND BEVERAGE SERVICE OPERATIONS-II (PRACTICAL)

COURSE OUTCOME CO1 Students will be able to organize Mise-en-place for various alcoholic beverages used in Food & Beverage Industry. CO2 Students will get hands on experience in service of various kinds of Wines. CO3 Students will be able to do analysis of various Wine Bar, Beer bar and Cocktail Bars CO4 Students will practically perform task to serve bottled, canned, Draught beers along with Service of Cheese

COURSE CODE: BHMCT-405 – 18 COURSE TITLE: FRONT OFFICE OPERATIONS - II (THEORY)

COURSE OUTCOME: CO1 Students will be able to develop knowledge on work ethics towards computer application and software used in front office. CO2 Students will be able to outline and explain Front Office Accounting System. CO3 Students will be able to endorse classify different mode of guest account settlement. CO4 Student will be able to analyse, evaluate & discuss night auditing in front office.

COURSE CODE: BHMCT-406 – 18 COURSE TITLE: FRONT OFFICE OPERATIONS-II (PRACTICAL)

COURSE OUTCOME CO1 Students will be able to acquire the knowledge of night auditing in front office operations. CO2 Students will be able to analyse, evaluate & learn the various stages of reservation through software. CO3 Students will be able to demonstrate reservation practices and to process deposit for arriving guest. CO4 To understand the use of various software's

COURSECODE: BHMCT-407 – 18 COURSETITLE: ACCOMODATION OPERATIONS -III (THEORY)

COURSEOUTCOME: CO1 Students will be able to acquire knowledge and learn about the importance of inspection and self-supervision techniques for cleaning staff.

CO2 Students will be able to understand and perform the linen exchange procedure and maintaining par stock, managing inventory and their importance.

CO3 Students will be able to handle special cleaning programme and cleaning agents in a scientific and efficient manner.

CO4 Student will be able to analyse & discuss Classification and Identification of Textile Fibbers used in hotel industry.

COURSE CODE: BHMCT408 – 18 COURSE TITLE: ACCOMODATION OPERATIONS -III (PRACTICAL) COURSE OUTCOME:

CO1 To gain the knowledge on usage of various fabric cleaners in Accommodations operations.

CO2 Students will be able to identify the cleaning equipment and cleaning agents & have the ability to use them appropriately.

CO3 Students will be able to analyse and develop cleaning schedule as per the requirement. CO4 Students will be able to setup all necessary materials and equipment's required for special cleaning.

COURSE CODE: BHMCT-409 – 18 COURSE TITLE: ACCOUNTING SKILLS FOR HOSPITALITY MANAGERS (THEORY)

COURSE OUTCOME: CO1 To provide basic understanding of the Principles of Accounting and use accounting skills in Hospitality Industry.

CO2 To enhance the accounting skills of the students to ensure the health of business

CO3 Students will be able to audit their hospitality business

CO4 Students shall be able to analyse and solve any issue arising in terms of financial aspects

Larder & Kitchen practices BHMCT 501-18

COURSE OUTCOMES

CO1 Students will learn about various aspects of larder section of the kitchen and its functions.

CO2 They will learn about the processing of Charcuterie along with the preparation of forcemeats, Galantines and Pates

CO3 Students will know about various Mousse and Mousselines.

CO4 They will be able to differentiate between various kinds of appetizers along with the importance of garnishes.

Larder & Kitchen practices (Practical's) BHMCT 502-18

COURSE OUTCOME

CO1 Students will get hands on experience on forcemeats along with the preparation of Pates, Terrines, Galantine & Ballontine.

CO2 To develop the ability to prepare various food items including meat products.

CO3 Students will get hadns on exposure in preparing the dishes

CO4 They will classify and build various accompaniments used along maincourse

Bar operations & Management BHMCT 503-18

COURSE OUTCOME

CO1 Students will get insight about various spirits and their method of production.

CO2 They will learn about varieties of Aperitifs & Liqueurs along with their uses. CO3 Students will be able to explain the History & Present scenario of Bar & Beverage Industry in India. CO4 Students will analyse and execute the bar operations and Selling techniques

Bar operations & Management (Practicals) BHMCT 504-18

COURSE OUTCOME

CO1 Students will learn about the service of various spirits; ie. Whisky, vodka, Rum, Gin, CO2 They will also learn to serve about varieties of Aperitifs & Liqueurs along with their uses.

CO3 Students will also learn to set bar for daily operations.

CO4 Students will also be able to mix beverages

Front Office Operations & Management BHMCT 505-18

COURSE OUTCOME

CO1 Students will be able to outline and explain Introduction of Bell desk, Equipment's used in Bell desk, Functions of Bell desk, Luggage handling, Paging, Change of room etc. Functions of Concierge, Forms & Formats.

CO2 Students will be able to analyse, evaluate Forecast formula, Types of forecast, Sample forecast forms, Factors for evaluating front office operations. Forecasting techniques, Forecasting Room availability.

CO3 Students will be able to endorse Importance of security systems, Safe deposit, Key control, Emergency situations.

CO4 Student will be able to perform Sales Techniques for Hotel Rooms .

Front Office Operations & Management BHMCT 506-18

COURSE OUTCOME

CO1 Students will be able to acquire the knowledge of Handling Concierge operations and Handing Bell desk.

CO2 Students will be able to analyse, evaluate &learn working of Forecasting reports for Room Availability with Individual Check-in, Check-Out, Overstay, under stay, Group Checkin & Group Checkout.

CO3 Students will be able to Handling of keys-situations related to loss of keys.

Accommodation Operations and Management BHMCT 507-18

COURSE OUTCOME

CO1 Students will be able to acquire knowledge and learn about the Planning and organising the housekeeping department.

CO2 Students will be able to perform various Budget and budgetary control, Operating Budgets- controlling expenses- income statement, purchasing systems- methods of buying, Stock records- issuing and control in Housekeeping operational

CO3 Students will be able to perform their professional Housekeeping skill in institute other than Hotels.

CO4 Students will be able to acquire the knowledge of contract service and Safety awareness and accident prevention in housekeeping operation

Accommodation Operations and Management BHMCT 508-18

COURSE OUTCOME

CO1 Students will be able to identify different layout To the Scale, Earmark Pillars, Specification of Colors, Furniture, Fixture, Fitting, Soft Furnishing and Accessories Etc. Used

CO2 Students will be able to identify the standard operating procedure of different cleaning surfaces and will be able to use in an appropriate professional manner.

CO3 Students will be able to identify the first aid kit and dealing with emergency situation in housekeeping operation

Food and Beverage Control and Management BHMCT 509-18

COURSE OUTCOME

CO1 To understand the basics of Food & Beverage Cost Control and it's importance in Food & Beverages.

CO2 Students will be able to analyze and procure requirements to optimize yield.

CO3 Students will learn about various methods of storing and issuing control along with inventory control.

CO4 Students will have understanding on aims & objective of Production control and methods of Sales control.

Mentoring and Professional Development BMPD 502-18

COURSE OUTCOME

CO1 Students will actively participates in various classroom activities like expert talk, aptitude test, Group Discussion and quiz which in turn help them improve communication skills.

CO2 students will be able to analyse and discuss on various issues raised in Group Discussions.

CO3 Students will have various outdoor activities which in turn helps them with team building.

CO4 Students will be able to be more confident.

International cuisine- An Exploration BHMCT 601-18

COURSE OUTCOME

CO1 Students will be able to gain knowledge about the cuisines of various European nations along with China

CO2 Students will learn about food production management and R&D in kitchen.

CO3 Students will acquire knowledge about on Principles of Food Presentation.

CO4 Students will have understanding on Molecular Gastronomy.

International cuisine- An Exploration (Practical's) BHMCT 602-18

COURSE OUTCOME

CO1 Students will have to prepare Food of various cuisines, such as Chinese, Spanish, Italian, German, British and Greek.

CO2 Students will get hands exposure on various techniques of Molecular Gastronomy. CO3 They will built up knowledge about the menu planning and executing the same CO4 Students will be able to differentiate among the methods of cooking for different cuisines.

Banquet and restaurant operations & Management BHMCT 603-18

COURSE OUTCOME

CO1 Students will be able to acquire knowledge about Planning and operations of various F&B outlets.

CO2 Students will be able to Plan and execute Function catering along with various Banquets & Buffets

CO3 Students will get practical experience in organizing and Executing Event Management and importance of MICE.

CO4 Students will know about the role of Kitchen Stewarding

Banquet and restaurant operations & Management Practical's BHMCT 604-18

COURSE OUTCOME CO1 Students will be able to plan and operate various F&B Outlets. CO2 Students will get hands on experience on Function Catering where they will organize and execute Banquet caterings.

CO3 Students will be able to plan and set up Buffets for functions.

CO4 Students will perform task on using and operating machines used in Kitchen Stewarding and maintain

Front Office Management BHMCT 605-18

COURSE OUTCOME

CO1 Students will be able to outline and explain of budget & budget cycle, Factors affecting budget planning, budgetary control and Forecasting room revenue in front office management.

CO2 Students will be able to explain timeshare options and vacation ownership.

CO3 Students will be able to endorse Importance of accommodation management aspects and Establishing standards, monitoring performance, Cost & pricing-Hubbart formula, Rule of the Thumb.

CO4 Students will be able to acquire knowledge and learn about the, Structure of the Airline Industry.

Front Office Management BHMCT 606-18

COURSE OUTCOME

CO1 Students will be able to acquire the knowledge of Yield Management calculations, preparing statistical data based on actual calculations.

CO2 Students will be able to learn Preparation of sales letters, brochure, tariff cards & other sales documents Assignment on GDS.

CO3 Students will be able to acquire the knowledge of Calculation of staff requirement & making of duty rotas for front office department of small, large & medium sized hotels with different levels of occupancy

Accommodation Management BHMCT 607-18

COURSE OUTCOME

CO1 Students will be able to acquire knowledge and learn about the Elements of Design, Lightening and Lightening Fixtures in Housekeeping department.

CO2 Students will be able to perform various 3R's of waste management, Garbage segregation and Energy Generation.

CO3Students will be able to explain ECO-FRIENDLY PRACTICES and System of certifying Ecotel

CO4 Students will be able to identify the ENERGY AND WATER CONSERVATION IN HOUSEKEEPING OPERATIONS

Accommodation Management BHMCT 608-18

COURSE OUTCOME

CO1 Students will be able to identify special decoration and planning with time split executing

CO2 Students will be able to understand the importance of team cleaning

CO3 Students will be able to identify the standard operating procedure of different cleaning surfaces and will be able to use in an appropriate& professional manner.

Principles of Management BHMCT 609-18

COURSE OUTCOME

CO1 Students will be introduced to Management, its features, classifications.

CO2 Students will get to know the planning and organizing in Management.

CO3 Students will learn about controlling and directing.

CO4 Students will also learn about Group dynamics.

Mentoring and Professional Development BMPD 602-18

Course Outcomes

CO1 Students will actively participates in various classroom activities like expert talk, aptitude test, Group Discussion and quiz which in turn help them improve communication skills.

CO2 students will be able to analyse and discuss on various issues raised in Group Discussions.

CO3 Students will have various outdoor activities which in turn helps them with team building.

CO4 Students will be able to be more confident.

BHMCT 701A-18 FOOD PRODUCTION MANAGEMENT

COURSE OUTCOME

CO1 Students will get acquainted to latest trends the field of specialization.

CO2 They will be able to classify and explain the use of technology in Food & Beverage production and Management

CO3 Students will be able to analyze the various products and demonstrate their use. CO4 Learner will be able to excel in the area of specialization and able to formulate solutions to the issues pertaining to the Industry

BHMCT 702A-18 - PRACTICAL FOOD PRODUCTION MANAGEMENT

COURSE OBJECTIVE

CO1 Learner will be able to illustrate supervisory role

CO2 Students will be practically able to formulate the plan to execute the operations of Hospitality business

CO3 Students will showcase their skills learned by hands on exposure in practical laboratories.

CO4 Students will be able to propose and develop Food & Beverage business models and ensure smooth running of the same.

BHMCT Batch 2018 onwards 703A – 18 TANDOOR-PRINCIPLE, CONCEPT AND APPLICATION

COURSE OUTCOME

CO1 Students will explain all the components and various roles involved in planning, organizing, running and evaluating an event;

CO2 They will apply the theory and skills necessary to professionally plan, organize and run a business event.

CO3 Students will understand the importance of strategic planning for an event or festival, including monitoring and evaluating the impacts on the wider community.

CO4 Learner will manage the all the aspects of a business operations

704A – 18 - PRACTICAL - . TANDOOR-PRINCIPLE, CONCEPT AND APPLICATION Suggested Menus:

COURSE OUTCOME

CO1 Students will explain all the components and various roles involved in planning, organizing, running and evaluating an event;

CO2 They will apply the theory and skills necessary to professionally plan, organize and run a business event.

CO3 Students will understand the importance of strategic planning for an event or festival, including monitoring and evaluating the impacts on the wider community.

CO4 Learner will manage the all the aspects of a business operations

BHMCT 702B-18- (PRACTICAL) FOOD AND BEVERAGES SERVICE

MANAGEMENT Course Objectives:

CO1 Learner will be able to illustrate supervisory role

CO2 Students will be practically able to formulate the plan to execute the operations of Hospitality business

CO3 Students will showcase their skills learned by hands on exposure in practical laboratories.

CO4 Students will be able to propose and develop Food & Beverage business models and ensure smooth running of the same

703B – **18 EVENT MANAGEMENT OBJECTIVE:** - To impart within student basic knowledge of organizing, Marketing & Promotions & Managing of Events. LEARNING OUTCOMES: Explain all the components and various roles involved in planning, organizing, running and evaluating an event; Apply the theory and skills necessary to professionally plan, organize and run a business event; and Understand the importance of strategic planning for an event or festival, including monitoring and evaluating the impacts on the wider community

BHMCT 701D-18 ACCOMMODATION MANAGEMENT OBJECTIVE: -

The students will get knowledge about Planning and organizing housekeeping department Store and stock control, Renovation of Rooms, contract Cleaning & crisis Management LEARNING OUTCOME: a) Students will get an insight about purchase and stock control b) Along with that students also learn about managing contractual services and crisis situation. c) Students also learn about renovation d) Contract Cleaning concepts & Managerial Handling

BHMCT 705- PRINCIPLES OF MARKETING

Course Objective: Marketing is one of the foremost functions of Management in present day corporate world, its understanding results in developing best products in terms of goods and services that brings consumer satisfaction. This course will imbibe the basic understanding among the students to become successful marketers.

Course Outcomes (COs): After completion of the course, the students shall be able to: CO1: Explain the basics of marketing, selling, marketing mix and its core concepts. CO2: Describe the intricacies of the marketing environment and marketing information systems for effective marketing planning and strategies.

CO3: Develop necessary skills for effective market segmentation, targeting and positioning. CO4 – Illustrate various components of product mix, product life cycle and comprehend the new product development process.

BHMCT 706-FINANCIAL MANAGEMENT

Course Objective: To develop a conceptual clarity and basic understanding of the fundamentals of corporate finance among the students. Further help them comprehend its practical applicability in the corporate world.

Course Outcomes (COs): After completion of the course, the students shall be able to: CO1: Apply financial data for use in decision making by applying financial theory to problems faced by business enterprises.

CO3: Apply time value of money to various pricing and money value.

CO4: Apply modern techniques in capital budgeting analysis.

CO5: Assess dividend policy's impacts on share prices

BHMCT 707-ENTREPRENEURSHIP

Course Objective: The objective of the course is to make the student understand the concept and importance of entrepreneurship and facilitate generation of young entrepreneurs. Course Outcomes (COs): After completion of the course, the students shall be able to:

CO1: Describe the concept and theories of entrepreneurship and its role in economic development of nation.

CO2: Develop business plan and identify the reasons of failure of business plans.

CO3: Illustrate the steps in starting MSME.

CO4: Comprehend government policies and regulatory framework available in India to facilitate the process of entrepreneurial development.

CO5: Identify different sources of finance for new enterprises and assess the role of financial institutions and various government schemes in entrepreneurial development.

BHMCT 708-PROJECT REPORT COURSE OUTCOME

CO1 Students will be able to do a field study

CO2 Students will be able to explore new hotel requirement in the region.

CO3 Students will have business insight

CO4 Students will be able to prepare a feasibility report related to Hotel Business

BHMCT 709-FACILITY PLANNING

Course Objective: The objective of the course is to make the student understand the classification of hotels as per the physical layout, importance of facilities and their maintenance, as well as cover important aspects of design to make the employee comfortable to work and the guest stay comfortable and convenient.

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

CO1: Classify hotels (Five, four, three, two, one & heritage).

CO2: Understand the importance of design and implement it.

CO3: Prepare a layout of the main service areas of a hotel

CO4: Comprehend new trends and methods for management of infrastructure

BMPD 702-18 MENTORING AND PROFESSIONAL DEVELOPMENT

Course Outcomes

CO1 Students will actively participates in various classroom activities like expert talk, aptitude test, Group Discussion and quiz which in turn help them improve communication skills.

CO2 students will be able to analyse and discuss on various issues raised in Group Discussions.

CO3 Students will have various outdoor activities which in turn helps them with team building.

CO4 Students will be able to be more confident.

BHMCT801-18 SPECIALIZED HOSPITALITY TRAINING

Outcome The students will gain day to day on-hand practical exposure in real life business activity under the supervision of industry experts. They will also learn to co-relate theoretical knowledge with practical realities.

COURSE OUTCOME

CO1 The students will gain practical exposure in real life business activity under the supervision of industry experts.

CO2 They will also learn to co-relate theoretical knowledge with practical realities.

CO3 Students will manage to learn in teams whilst on Training at a Hotel

CO4 They will enhance their interpersonal skills while working in Industry

BMPD 802-18 MENTORING AND PROFESSIONAL DEVELOPMENT

Course Outcomes

CO1 Students will actively participates in various classroom activities like expert talk, aptitude test, Group Discussion and quiz which in turn help them improve communication skills.

CO2 students will be able to analyse and discuss on various issues raised in Group Discussions.

CO3 Students will have various outdoor activities which in turn helps them with team building.

CO4 Students will be able to be more confident.