CHILDREN'S EDUCATION SOCIETY (Regd.)
THE OXFORD COLLEGE OF ENGINEERING
(Recognised by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi.
Approved by A.I.C.T.E. New Delhi.
Recognised by UGC Under Section 2(f)
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COURSE OUTCOMES
Academic Year 2022-2023

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

Course Name: C101 (BMATS101- Mathematics-I For Cse Stream)

C101.1	Apply the knowledge of calculus to solve problems related to polar curves and learn the notion of partial differentiation to compute rate of change of multivariate functions
C101.2	Analyze the solution of linear and nonlinear ordinary differential equations.
C101.3	Get acquainted and to apply modular arithmetic to computer Algorithms.
C101.4	Make use of matrix theory for solving the system of linear equations and compute eigenvalues and eigenvectors
C101.5	Familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/ PYTHON/ SCILAB.

Course Name: C102 (BPHYS102- Physics for CSE stream)

C102.1	Describe the principles of LASERS and Optical fibers and their relevant applications.
C102.2	Discuss the basic principles of the Quantum Mechanics and its application in Quantum Computing.
C102.3	Summarize the essential properties of superconductors and applications in Quantum Computing.
C102.4	Illustrate the application of physics in design and data analysis.
C102.5	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

Course Name: C103 (BPOPS103- Principles of Programming Using C)

C103.1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts
C103.2	Apply programming constructs of C language to solve the real world problem
C103.3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
C103.4	Explore user-defined data structures like structures, unions and pointers in implementing solutions

Course Name: C104 (BESCK104C - Introduction to Electronics Communication)

C104.1	Describe the concept of electronic circuits encompassing power supplies, amplifiers and oscillators.
C104.2	Describe the characteristics and application of operational amplifiers
C104.3	Present the basics of digital logic engineering including data representation, Boolean algebra and design of Combinational logic design using basic gates
C104.4	Discuss the characteristics, technological advances of embedded systems and role of sensors and actuators in instrumentation and control
C104.5	Explain the fundamentals of communication engineering and different modes of communications

Course Name: C105 (BETCK105H - Introduction to Internet of Things (IOT))

C105.1	Describe the evolution of IoT, IoT networking components, and addressing strategies in IoT
C105.2	Classify various sensing devices and actuator types.
C105.3	Demonstrate the processing in IoT.

C105.4	Explain Associated IOT Technologoes
C105.5	Illustrate architecture of IOT Applications

Course Name: C106 (BENGK106- Communicative English)

C106.1	Understand and apply the fundamentals of communication skills in their communication skills.
C106.2	Identify the nuances of phonetics, intonation and enhance pronunciation skills.
C106.3	To impart basic English grammar and essentials of language skills as per present requirement.
C106.4	Understand and use all types of English vocabulary and language proficiency
C106.5	Adopt the techniques of information transfer through presentation.

Course Name: C107 (BICOK107- Indian Constitution)

C107.1	Analyse the basic structure of Indian Constitution.
C107.2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution
C107.3	know about our Union Government, political structure & codes, procedures.
C107.4	Understand our State Executive & Elections system of India.
C107.5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.

Course Name: C108 (BIDTK158-Innovation and Design Thinking)

C108.1	Appreciate various design process procedure
C108.2	Generate and develop design ideas through different technique
C108.3	Identify the significance of reverse Engineering to Understand products
C108.4	Draw technical drawing for design ideas

Course Name: C111 (BMATS201-Mathematics for CSE Stream –II)

C111.1	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume.
C111.2	Understand the applications of vector calculus refer to solenoidal, and irrotational vectors. Orthogonal curvilinear coordinates.
C111.3	Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation
C111.4	Apply the knowledge of numerical methods in analyzing the discrete data and solving the physical and engineering problems.
C111.5	Get familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB /PYTHON/ SCILAB

Course Name: C112 (BCHES202-Chemistry for CSE Stream)

C112.1	Identify the terms and processes involved in scientific and engineering applications
C112.2	Explain the methods of phenomena of chemistry to describe the engineering processes
C112.3	Solve for the problems in chemistry that are pertinent in engineering applications
C112.4	Apply the basic concepts of chemistry to explain the chemical properties and processes
C112.5	Analyse properties and processes associated with chemical substances in multidisciplinary situations

Course Name: C113 (BCEDK203-Computer-Aided Engineering Drawing)

C113.1	Draw and communicate the objects with definite shape and dimensions
C113.2	Recognize and Draw the shape and size of objects through different views
C113.3	Develop the lateral surfaces of the object
C113.4	Create a Drawing views using CAD software.
C113.5	***I***dentify the interdisciplinary engineering components or systems through its graphical representation.

Course Name: C114 (BESCK204B -Introduction to Electrical Engineering)

C114.1	Understand the concepts of various energy sources and Electric circuits.
C114.2	Apply the basic Electrical laws to solve circuits.
C114.3	Discuss the construction and operation of various Electrical Machines.
C114.4	Identify suitable Electrical machine for practical implementation.
C114.5	Explain the concepts of electric power transmission and distribution, electricity billing, circuit protective devices and personal safety measures.

Course Name: C115 (BPLCK205C- Basics to JAVA programming)

C115.1	To explain the features and object oriented concepts in JAVA programming
C115.2	To analyse working of bitwise operators in JAVA
C115.3	To develop simple programs based on polymorphism and inheritance
C115.4	To describe the concepts of importing packages and exception handling mechanism

Course Name: C116 (BPWSK206-Professional Writing Skills in English)

C116.1	To understand and identify the common errors in writing and speaking.
C116.2	To achieve better technical writing and presentation skills.
C116.3	To read technical proposals properly and make them to write good technical reports.
C116.4	Acquire employment and workplace communication skills.
C116.5	To learn about techniques of information transfer through presentation in different level.

Course Name: C117 (BKSKK207-Samskrutika Kannada)

C117.1	ಕನ್ನಡ□, □□ತ□ ಮಞ್ಞ ಕನ್ನಡದ □ಸಜ್ಜೃೀಯ ೞಞ್ಞ ಅಱಿಲಱತ್ತ ಂ.
C117.2	ಕನ್ನಡ □□ತ□ದ ಪ□ ಭನ್ನಗ□ದ ಆಚಾಖಿಕ ಶವಶಿ ಮಞ್ಞ ಆಚಾಖಿಕ ಒವ□ಗಳಱ್ನ □ಂಂೀೀಂೀಂಕ□ಜ ಕಱಞ್ಞ ಞ□□ನ ಒಱಡ ಮಞ್ಞ ೂನಃಜೆ □ಒ ೀೀಂಶಿಱಿಳತ್ತ ಂ.
C117.3	ಱೀ□ ವ್ಯಾಗಳಱ□ □□ತ□ ಮಞ್ಞ □ಸಜ್ಜೃೀಯ ಬಡ□ ಅಱಿ □ಟಆಸಒ್ಯಱ್ನ ಞೈ□ ಞತ್ತ ಂ.
C117.4	ಞಂೀೀಂ□ಕ ವ□ ಒ್ಗಳ ಪಱಚಯ □ಟಅವಱಗಳ □ಭಂ□ದ ಱಷಯಗಳಱ್ನ ೀೀಂ್ಕಱಂೂ ಕಲನ ಇಖಿತರ ವ□ ಒ್ಗಳ ಬಡ□ ೀೀಂ್ಕಱಳ□ ಗ ಈಞಕ□ ಞೈ□ ಞತ್ತ ಂ.
C117.5	□ಂಂಸಜ್ಜೃೀಂಕ, ಜನಪದ□ಟಪ□ □ಸ ಕಥನಗಳ ಪಱಚಯ□ಲಆಳಿಱ.

Course Name: C118 (BKBKK207- Balake Kannada)

C118.1	To understand the necessity of learning of local language for comfortable life.
C118.2	To speak, read and write Kannada language as per requirement.

C118.3	To communicate (converse) in Kannada language in their daily life with kannada speakers.
C118.4	To Listen and understand the Kannada language properly.
C118.5	To speak in polite conservation.

Course Name: C119 (BSFHK258-Scientific Foundations for Health)

C119.1	To understand and analyse about Health and wellness (and its Beliefs) & It's balance for positive mindset
C119.2	Develop the healthy lifestyles for good health for their better future.
C119.3	Build a Healthy and caring relationships to meet the requirements of good/social/positive life.
C119.4	To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future
C119.5	Prevent and fight against harmful diseases for good health through positive mindset.

Course Name: C201 (Transform Calculus, Fourier Series and Numerical Techniques - 21MAT31)

C201.1	To solve ordinary differential equations using Laplace transform.
C201.2	Demonstrate Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing and field theory.
C201.3	To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations
C201.4	To solve mathematical models represented by initial or boundary value problems involving partial differential equations
C201.5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

Course Name: C202 (Data Structures and Applications - 21CS32)

C202.1	Identify different data structures and their applications.
C202.2	Apply stack and queues in solving problems.
C202.3	Demonstrate applications of linked list.
C202.4	Explore the applications of trees and graphs to model and solve the real-world problem.
C202.5	Make use of Hashing techniques and resolve collisions during mapping of key value pairs

Course Name: C203 (Analog and Digital Electronics - 21CS33)

C203.1	Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC and op-amp.
C203.2	Explain the basic principles of A/D and D/A conversion circuits and develop the same.
C203.3	Simplify digital circuits using Karnaugh Map, and Quine-McClusky Methods
C203.4	Explain Gates and flip flops and make us in designing different data processing circuits, registers and counters and compare the types.
C203.5	Develop simple HDL programs

Course Name: C204 (Computer Organization and Architecture - 21CS34)

C204.1	Explain the organization and architecture of computer systems with machine instructions and programs

C204.2	Analyze the input/output devices communicating with computer system
C204.3	Demonstrate the functions of different types of memory devices
C204.4	Apply different data types on simple arithmetic and logical unit
C204.5	Analyze the functions of basic processing unit, Parallel processing and pipelining

Course Name: C205 (Object Oriented Programming with JAVA Laboratory - 21CSL35)

C205.1	Use Eclipse/NetBeans IDE to design, develop, debug Java Projects
C205.2	Analyze the necessity for Object Oriented Programming paradigm over structured programming and become familiar with the fundamental concepts in OOP.
C205.3	Demonstrate the ability to design and develop java programs, analyze, and interpret object-oriented data and document results.
C205.4	Apply the concepts of multiprogramming, exception/event handling, abstraction to develop robust programs.
C205.5	Develop user friendly applications using File I/O and GUI concepts.

Course Name: C206 (Mastering Office-21CSL381)

C206.1	Know the basics of computers and prepare documents, spreadsheets, make small presentations with audio, video and graphs and would be acquainted with internet.
C206.2	Create, edit, save and print documents with list tables, header, footer, graphic, spellchecker, mail merge and grammar checker
C206.3	Attain the knowledge about spreadsheet with formula, macros spell checker etc.
C206.4	Demonstrate the ability to apply application software in an office environment.
C206.5	Use Google Suite for office data management tasks

Course Name: C207 (Social Connect and Responsiblity- 21SCR36)

C207.1	Understand social responsibility
C207.2	Practice sustainability and creativity
C207.3	Showcase planning and organizational skills

Course Name:C208(SAMSKRUTIKA KANNADA-21KSK37)

C208.1	Kannada language, literature and Kannada culture will be introduced.
C208.2	Interest in pre- modern and modern poetry and culture of Kannada literature arises.
C208.3	Introduction of technical persons.
C208.4	Kannada grammar, general Kannada and administrative Kannada words will be introduced.

Course Name:C208(BALAKE KANNADA-21KBK37)

C207.1	To understand the necessity of learning of local language for comfortable life.
C207.2	To Listen and understand the Kannada language properly.
C207.3	To speak, read and write Kannada language as per requirement.

C207.4	To communicate (converse) in Kannada language in their daily life with kannada speakers.
C207.5	To speak in polite conservation.

Course Name: C209 (Constitution of India and Professional Ethics-21CIP37)

C208.1	Analyse the basic structure of Indian Constitution.
C208.2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.
C208.3	know about our Union Government, political structure & codes, procedures.
C208.4	Understand our State Executive & Elections system of India.

Course Name: C211 (Mathematical Foundations for computing- 21CS41)

C211.1	Apply the concepts of logic for effective computation and relating problems in the Engineering domain
C211.2	Analyse the concepts of functions and relations to various fields of engineering. Comprehend the concepts of Graph Theory for various applications of Computational sciences
C211.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in the engineering field.
C211.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data
C211.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.

Course Name: C212 (Design and Analysis of Algorithms-21CS42)

C212.1	Understand the design principles, concepts of algorithm design and methods for analysing the efficiency of algorithms using time and space complexity theory
C212.2	Design and analyse problem solving using divide and conquer strategy
C212.3	Apply greedy method to solve problems to find an optimal solution
C212.4	Apply dynamic programming to solve problems using the solutions of similar subproblems
C212.5	Design and apply backtracking technique for problem solving

Course Name: C213 (Microcontroller and Embedded Systems-21CS43)

C213.1	Explain C-Compilers and optimization
C213.2	Describe the ARM microcontroller's architectural features and program module.
C213.3	Apply the knowledge gained from programming on ARM to different applications.
C213.4	Program the basic hardware components and their application selection method
C213.5	Demonstrate the need for a real-time operating system for embedded system applications.

Course Name: C214 (Operating Systems-21CS44)

C214.1	Identify the structure of an operating system and its scheduling mechanism
C214.2	Demonstrate the allocation of resources for a process using scheduling algorithm.
C214.3	Identify root causes of deadlock and provide the solution for deadlock elimination

C214.4	Explore about the storage structures and learn about the Linux Operating system
C214.5	Analyze Storage Structures and Implement Customized Case study.

Course Name: C215 (Biology for Engineers-21BE45)

C215.1	Elucidate the basic biological concepts via relevant industrial applications and case studies.
C215.2	Evaluate the principles of design and development, for exploring novel bioengineering projects.
C215.3	Corroborate the concepts of biomimetic for specific requirements.
C215.4	Think critically towards exploring innovative bio based solutions for socially relevant problems

Course Name: C216 (Python Programming Laboratory-21CSL46)

C216.1	Demonstrate proficiency in handling of loops and creation of functions.
C216.2	Identify the methods to create and manipulate lists, tuples and dictionaries.
C216.3	Discover the commonly used operations involving regular expressions and file system.
C216.4	Interpret the concepts of Object-Oriented Programming as used in Python.
C216.5	Determine the need for scraping websites and working with PDF, JSON and other file formats

Course Name: C217 (Web Programming-21CSL481)

C217.1	Describe the fundamentals of web and concept of HTML
C217.2	Use the concepts of HTML, XHTML to construct the web pages.
C217.3	Interpret CSS for dynamic documents.
C217.4	Evaluate different concepts of JavaScript & Construct dynamic documents.
C217.5	Design a small project with JavaScript and XHTML.

Course Name: C219(Universal Human Values-21UH49)

C219.1	Explore Holistic vision of life –themselves and their surroundings
C219.2	Develop Competence and capabilities for maintaining Health and Hygiene
C219.3	Analyze various problems in life, family ,society and in handling problems with Sustainable solutions
C219.4	Apply values to their own self in different day-to- day settings in real life and in handling in real life and in handling problems with sustainable solutions
C219.5	Adopt the value of appreciation and aspiration for excellence and gratitude for all.

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DEPARTMENT OF BIOTECHNOLOGY

Course Name: C101 (Mathematics-I for Cse- Engg Stream)

C101.1	Apply the knowledge of calculus to solve problems related to polar curves and learn the notion of partial differentiation to compute rate of change of multivariate functions
C101.2	Analyze the solution of linear and nonlinear ordinary differential equations.
C101.3	Get acquainted and to apply modular arithmetic to computer Algorithms.
C101.4	Make use of matrix theory for solving the system of linear equations and compute eigen values and eigenvectors
C101.5	Familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/ PYTHON/ SCILAB.

Course Name: 102 (Chemistry for CSE/EE/CV/ME Stream)

C102.1	Identify the terms and processes involved in scientific and engineering applications
C102.2	Explain the methods of phenomena of chemistry to describe the engineering processes
C102.3	Solve for the problems in chemistry that are pertinent in engineering applications
C102.4	Apply the basic concepts of chemistry to explain the chemical properties and processes
C102.5	Analyse properties and processes associated with chemical substances in multidisciplinary situations

Course Name: C103 (BCEDK103- Computer Aided Engineering Drawing)

C103.1	Draw and communicate the objects with definite shape and dimensions
C103.2	Recognize and Draw the shape and size of objects through different views
C103.3	Develop the lateral surfaces of the object
C103.4	Create a Drawing views using CAD software.
C103.5	***I***dentify the interdisciplinary engineering components or systems through its graphical representation.

Course Name: C104(BESCK104B- Introduction to Electrical Engineering)

C104.1	Understand the concepts of various energy sources and Electric circuits.
C104.2	Apply the basic Electrical laws to solve circuits.
C104.3	Discuss the construction and operation of various Electrical Machines.
C104.4	Identify suitable Electrical machine for practical implementation.
C104.5	Explain the concepts of electric power transmission and distribution, electricity billing, circuit protective devices and personal safety measures.

Course Name: C105(BPLCK105A- Introduction to Web Programming)

C105.2	Explain the historical context and justification for HTML over XHTML
C105.2	Develop HTML5 documents and adding various semantic markup tags
C105.2	Analyse various attributes, values and types of CSS
C105.2	Implement core constructs and event handling mechanisms of JavaScript.

Course Name: C105 (BPLCK105B- Introduction to Python Programming)

C105.1	Demonstrate proficiency in handling loops and creation of functions
C105.2	Identify the methods to create and manipulate lists, tuples and dictionaries
C105.3	Develop programs for string processing and file organization
C105.4	Interpret the concepts of Object-Oriented Programming as used in Python

Course Name: C106 (BENGK106-Communicative English)

C106.1	Understandandapplythefundamentalsofcommunicationskillsintheircommunicationskills
C106.2	Identify the nuances Of phonetics, Intonation And enhance pronunciation Skills.

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C106.3	To impart basic English grammar and essentials Of language skills as per present requirement.
C106.4	Understand and use all types Of English vocabulary And language proficiency
C106.5	Adopt the techniques of Information transfer through presentation

Course Name:C107(SAMSKRUTHIKA KANNADABKSKK107)

C107.1	ಕನ಺ಡ್ದ□, □□ತ□ ಮಣ್ಶಿಕನ಺ಡದ □ಸಜ್ಕೃ಺ರ಺ಯ಺ಣ್ಶಅ಼ಖೊಲಙತಿ಺.
C107.2	ಕನ಺ಡ □□ತ□ದಪ□ ಲ್ವಗ಻ದಆಔಖಕಜವರಮಣ್ಶಿಆಔಖಕ಻ವ□ಗಳಱ಺ □಺ಂ಺ರ಺ಕ಻ಜಕಯಣ್ಶಗ□□ನ಼ಠಡಮಣ್ಶಿ್ನಃಜೆ □಺ರ಺ಹೊಫತಿ಺.
C107.3	ಒಠ□ ವ್ರಗಳಯ□ □□ತ□ ಮಣ್ಶಿ □ಸಜ್ಕೃ಺ರ಺ಯಬಡ□ ಅ಼ □ಟಆಸ಼ಿಯಱ಺ಗೃ□ ಞತಿ಺.
C107.4	ಱ಺ಂ಺ರ಺□ಕವ□ ಇಿಗಳಪ಼ಚಯ □ಟಅವ಼ಗಳ □ಲ□ದಷಯಗಳಱ಺ರ಺಼ಆಂಫಖಲನಇಬ಺ತರವ□ ಇಿಗಳಬಡ□ ಼ರ಺಼ಆಳ□ ಣಈಣ್ಶಕ□ ಗೃ□ ಞತಿ಺.
C107.5	□಺ಂಸಜ್ಕೃ಺ರ಺ಕ, ಜನಪದ□ಟಪ□ ಻ಸಕಥನಗಳಪ಼ಚಯ□ಲಆಫ಼.

Course Name: C107(BALAKE KANNADA-BKBKK107)

C107.1	To understand the necessity of learning of local language for comfortable life.
C107.2	To speak, read and write Kannada language as per requirement.
C107.3	To communicate (converse) in Kannada language in their daily life with kannada speakers.
C107.4	To Listen and understand the Kannada language properly.
C107.5	To speak in polite conservation.

Course Name: C108(Scientific Foundations of Health-BSFHK158)

C108.1	To understand and analyse about Health and wellness (and its Beliefs) & It's balance for positive mindset
C108.2	Develop the healthy lifestyles for good health for their better future.
C108.3	Build a Healthy and caring relationships to meet the requirements of good/social/positive life.
C108.4	To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future
C108.5	Prevent and fight against harmful diseases for good health through positive mindset.

Course Name: C109(Mathematics-II For CSE Stream)

C109.1	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume.
C109.2	Understand the applications of vector calculus refer to solenoidal, and irrotational vectors. Orthogonal curvilinear coordinates.
C109.3	Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation
C109.4	Apply the knowledge of numerical methods in analyzing the discrete data and solving the physical and engineering problems.
C109.5	Get familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB /PYTHON/ SCILAB

Course Name: C110 (Physics For CSE Stream)

C110.1	Describe the principles of LASERS and Optical fibers and their relevant applications.
C110.2	Discuss the basic principles of the Quantum Mechanics and its application in Quantum Computing.

C110.3	Summarize the essential properties of superconductors and applications in Quantum Computing
C110.4	Illustrate the application of physics in design and data analysis
C110.5	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

Course Name: C111 (BBEE203-Basic Electronics)

C111.1	Develop the basic knowledge on construction, operation and characteristics of semiconductor devices.
C111.2	Apply the acquired knowledge to construct small scale circuits consisting of semiconductor devices
C111.3	Develop competence knowledge to construct basic digital circuit by make use of basic gate and its function.
C111.4	Construct the conceptual blocks for basic communication system.
C111.5	Apply the knowledge of various transducers principle in sensor system.

Course Name: C112 (BESCK204E-Introduction to C Programming)

C112.1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts
C112.2	Apply programming constructs of C language to solve the real world problem
C112.3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
C112.4	Explore user-defined data structures like structures, unions and pointers in implementing solutions
C112.5	Design and Develop Solutions to problems using modular programming constructs using functions

Course Name: C113 (BETCK205H-Introduction to Internet of Things (IOT)

C113.1	Describe the evolution of IoT, IoT networking components, and addressing strategies in IoT
C113.2	Classify various sensing devices and actuator types.
C113.3	Demonstrate the processing in IoT.
C113.4	Explain Associated IOT Technologoes
C113.5	Illustrate architecture of IOT Applications

Course Name: C114 (BPWSK206-Professional Writing Skills in English)

C114.1	To Understand And Identify The Common Errors In Writing And Speaking.
C114.2	To Achieve Better Technical Writing And Presentation Skills.
C114.3	To Read Technical Proposals Properly And Make Them To Write Good Technical Reports.
C114.4	Acquire Employment And Workplace Communication Skills.
C114.5	To Learn About Techniques Of Information Transfer Through Presentation In Different Level.

Course Name: C115 (BICOK207-Indian Constitution)

C115.1	Analyse the basic structure of Indian Constitution.
C115.2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution
C115.3	Know about our Union Government, political structure & codes, procedures.
C115.4	Understand our State Executive & Elections system of India.
C115.5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.

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Course Name:C116(BIDTK258-INNOVATION and DESIGN THINKING)

C116.1	Appreciate various design process procedure
C116.2	Generate and develop design ideas through different technique
C116.3	Identify the significance of reverse Engineering to Understand products
C116.4	Draw technical drawing for design ideas

Course Name: C201 (Transform Calculus, Fourier series and numerical techniques-21MAT31)

C201.1	The Student will be able to solve ordinary differential equations using laplace trasform .
C201.2	Demonstrate the fourier series to study the behaviour of periodic functions and their applications in system communications , digital processing and field theory
C201.3	To use Fourier transform to analyse problems involving continuous time signals and to apply Z transform techniques to solve differential equations
C201.4	To solve mathematical models represented by initial or boundary value problems involving partial differential equations
C201.5	Determine the externals of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis

Course Name: C202 (Unit Operations + Lab - 21BT32)

C202.1	Describe the nature and properties of fluids
C202.2	Perform various flow measurements using different instruments
C202.3	Explain the principle of various mechanical operations like size reductions , conveying equipment , sedimentation and mixing tanks
C202.4	Illustrate the law governing the heat and mass transfer operations
C202.5	Analyse the construction details of treated mass transfer equipment for specific requirements

Course Name: C203 (Biochemistry + Lab-21BT33)

C203.1	Explain the fundamentals of biologically important molecule such as structures , functions and interactions
C203.2	Understand complex biochemical pathways within living cells and the associated metabolic disorders
C203.3	Comprehend biochemical principles and apply them to biological systems / samples
C203.4	Perform basic biochemical experiments , analyse, interpret and present the data

Course Name: C204 (Microbiology – 21BT34)

C204.1	correlate the structure, function and metabolic pathways of microorganisms
C204.2	Apply the principles of microbial culture for identifying the appropriate technique used in culture and characterization of microorganisms under aseptic conditions
C204.3	Analyse the role of microorganisms in environmental protection industrial application and infectious diseases

Course Name: C205 (Microbiology Lab – 21BTL35)

C205.1	To apply theoretical knowledge and execute experiments pertaining to methods of sterilization, microbial identification and characterization
C205.2	Apply the basic techniques of microbiology in various experiments related to Agriculture, Food and Environment
C205.3	Analyse the relationship of microbes with human health

Course Name: C206 (Social Connect and Responsibility - 21UH36/21SCR36)

C206.1	Understand social responsibilities
C206.2	Practice sustainability and creativity

C206.3	Showcase planning and organisation skills

Course Name: C207 (Samskruthika Kannada-21KSK37)

C207.1	ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯವಾಗುತ್ತದೆ.
C207.2	ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳು ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಆಸಕ್ತಿಯು ಮೂಡುತ್ತದೆ
C207.3	ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ
C207.4	ಕನ್ನಡ ಭಾಷಾಭ್ಯಾಸ, ಸಾಮಾನ್ಯ ಕನ್ನಡ ಹಾಗೂ ಆಡಳಿತ ಕನ್ನಡದ ಪದಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ

Course Name: C207 (Balake Kannada-21KBK37)

C207.1	To understand the necessity of learning of local language for comfortable life
C207.2	To listen and understand the Kannada language properly
C207.3	To speak, read and write Kannada language as per requirement
C207.4	To communicate (converse) in Kannada language in their daily life with Kannada speakers
C207.5	To speak in polite conservation

Course Name: C208 (Linux Programming for Biologists – 21BT384)

C208.1	Understand the basic set of commands and editors in Linux operating system
C208.2	Solve simple problem using shell scriptive
C208.3	Apply the basics to appreciate LINUX as an operating system

Course Name: C209 (Complex analysis, probability & statistical method-21MAT41)

C209. 1	Use the concept of analytic function and complex potential to solve the problem arising in electromagnetic field theory utilise conformal transformation and complex integral arising in aerofoil theory fluid flow, visualisation and image processing
C209. 2	Obtain series solution of ordinary differential equations.
C209. 3	Make a use of correlation and regression analyses to fit a suitable mathematical model for statistical data.
C209.4	Apply discrete and continuous probability distributions in analysing the probability models arising in the engineering fields
C209.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis

Course Name: C210 (Python Programming + Lab -21BT42)

C210.1	Develop algorithmic solutions to simple computational problems
C210.2	Read, write, debug ,execute simple python programs
C210.3	Structures simple python programs for solving problems
C210.4	Decompose a Python program into functions

Course Name: C211 (Cell biology & cell culture techniques + Lab 21BT43)

C211.1	Understand the cellular structures and their functions with emphasis on the cell cycle events
C211.2	Apply the concepts of cell- cell signalling, transport of molecules and cell death in cell culture methods
C211.3	Comprehend the applications of plant tissue culture techniques in Agriculture, Food and Medicine
C211.4	Analyze the principles of animal cells culture in drug and toxicity testing

Course Name: C212 (Molecular biology & Genetic engineering -21BT44)

C212.1	Understand the basic concepts of Genetic Engineering for augmentation of traits
C212.2	Apply and comprehend the principles of gene manipulation, expression and interaction of genes and proteins
C212.3	Evaluate the screening and interaction studies using classical / conventional and high through put methods
C212.4	Design the strategies for gene cloning and gene editing

Course Name: C213 (Biology for engineers -21BE45)

C213.1	Elucidate the basic biological concepts via relevant industrial applications and case studies
C213.2	Evaluate the principles of design and development, for exploring novel bioengineering projects
C213.3	Corroborate the concepts of biomimetics for specific requirements
C213.4	Think critically towards exploring innovative biobased solutions for socially relevant problems

Course Name: C214 (Molecular Biology & Genetic Engineering Lab -21BTL46)

C214.1	Apply the principles of molecular biology and genetic engineering
C214.2	Conduct experiments related to isolation ,separation, quantification ,digestion and amplification of nucleic acids
C214.3	Interpret and discuss the outcome of experiments formally through return reports

Course Name: C215 (Constitution of India and Professional Ethics – 21CIP47)

C215.1	Analyse the basic structure of Indian constitution
C215.2	Remember their Fundamental Rights , DPSP's and Fundamental Duties (FD's) of our constitution
C215.3	Know about our union government political structure and codes, procedures
C215.4	Understand our state Executive and Election system of India
C215.5	Remember the amendments and Emergency Provisions, other important provisions given by the constitution

Course Name: C216 (Quality Control And Quality Assurance 21BT482)

C216.1	Apply the Principles of Quality Management, QC and QA in the BT industry
C216.2	Understand the various guidelines and apply the same in the Pharma and Food industry.
C216.3	Analyse raw materials and finished products in line with the standards

Course Name: C217 (Universal Human Values -21UH49)

C217.1	Students are expected to become more aware of themselves and their surrounding (family, society, nature)
C217.2	Become more responsible in life and in handling problems with sustainable solutions
C217.3	They would have better critical ability
C217.4	They would also become sensitive to their commitment towards what they have understood (human values , human relationships and human society)

Course Name: C301 (BIO-BUSINESS AND ENTREPRENEURSHIP-18BT51)

C301.1	To Analyze societal problems and derive biotech based scientific solutions
C301.2	To understand analyze and explore entrepreneurship opportunity in biotechnology
C301.3	To Explore funding opportunity for innovations and startups.
C301.4	To accelerate innovation and conservation of IPR and Exploit business opportunity through expired patent, technology learning and licencing.

C301.5	To illustrate scientific problem and understand the regulatory norms of biosafety and ethics

Course Name: C302 (BIOKINETICS & BIOREACTION ENGG - 18BT52)

C302.1	Understand the different importance of kinetic and thermodynamic considerations for the choice of feed temperature in reactor systems.
C302.2	Understand the mechanism and kinetics of chemical, enzyme and microbial reactions.
C302.3	Identify and summarize the parameters from range reactions to optimize reactor design and development.
C302.4	Demonstrate the use of various scientific parameters to improve the performance of fermentation process
C302.5	Develop suitable environment for microbial growth by analysing various parameters.

Course Name: C303 (ENZYME TECHNOLOGY & BIOTRANSFORMATION-18BT53)

C303.1	Classify and identify the enzymes based on the biochemical reaction catalyzed by them
C303.2	Compare enzymes and catalyst, and explain the mechanism of enzyme catalysis
C303.3	Recognize & Interpret the importance of enzymes in medicine
C303.4	Explain the methods involved in study of enzyme kinetics , standardization and optimization of enzyme catalyzed reactions
C303.5	Summarize the applications of enzymes in medicine and industry

Course Name: C304 (GENOMICS & PROTEOMICS-18BT54)

C304.1	Able to apply DNA/genome sequencing techniques to various genome projects.
C304.2	Able to analyze genomes of various organisms and genome annotation importance.
C304.3	Able to correlate the relationship between genome, transcriptome, proteome and metabolome.
C304.4	Able to apply the knowledge of the major web-resources and the notion about how the methods are applied in real-life scientific research
C304.5	The students will be able to understand how to perform simple analysis of this data, and remember examples of how the research tools are applied in published investigations.

Course Name: C305 (BIOANALYTICAL TECHNIQUES-18BT55)

C305.1	Apply principles of various analytical devices used in research and enhance problem solving techniques
C305.2	Define the fundamentals of downstream processing for product recovery
C305.3	Understand the requirements for successful operations of analytical techniques
C305.4	Ability to understand the concept of biomolecules identification technique or method
C305.5	Evaluate theoretical and computational skills of biophysical aspects in structure activity studies.

Course Name: C306 (GENETIC ENGG &APPLICATION-18BT56)

C306.1	Able to categorize vectors, enzymes and nucleic acid purification strategies important for transgenic technology, gene manipulation concepts and transgene methods.

C306.2	Choose& explain specific techniques like PCR, Blotting & construction of libraries
C306.3	Differentiate between & learn the different gene/DNA transfer techniques
C306.4	Outline the various methods of producing transgenic organisms and sub-divide
C306.5	summarize the applications of genetic engineering for the welfare of mankind & society

Course Name:C307 (BIOKINETICS & ENZYME TECH LAB-18BTL57)

C307.1	State and define the nature of the reaction, rate of the reaction, rate constant and enzyme activity.
C307.2	Compare the rate of reaction for different reactors; know the ethical responsibilities that come with conducting experiments and communicating data.
C307.3	Use the design equations for predicting the reactor performance.
C307.4	Compose the RTD data to identify non idealitites in different reactor configuration.
C307.5	Able to investigate various methods available for isolation, purification and characterization of enzymes
C307.6	Able to apply the principles and methods of immobilization of enzymes useful in a diverse range of industries

Course Name: **C308** (**GENETIC ENGG & CELL CULTURE LAB-18BTL58**)

C308.1	Demonstrate/perform the basic cell culture techniques *in vitro*
C308.2	To analyze the effects of physio-chemical factors and growth hormones for the growth and development of the cultures *in vitro*
C308.3	Explain and perform some of the more advanced techniques, e.g. embryo culture and protoplast isolation and regeneration
C308.4	Choose a suitable experimental method to isolate, quantify & measure the concentration of DNA & RNA
C308.5	Perform gene transformation using the appropriate method
C308.6	Analyze and identify the DNA & protein by suitable technique

Course Name: C309 (BIOPROCESS CONTROL AND AUTOMATION-18BT61)

C309.1	Able to describe the Instrumentation of flow, pressure, temperature and to analyze online data and understand the dynamics and control of bioreactors
C309.2	Able to solve problems of response of first order systems for different types of input and Able to determine the transient response and to derive the transfer functions of first order systems
C309.3	Able to determine the transient response and to derive the transfer functions of second order systems
C309.4	Able to Understand the parameters to be measured and controlled in the bioreactor and Able to apply the design aspects for block diagrams
C309.5	Able to use the concept of stability for solving the problems and to analyze the different control algorithms

Course Name: C310 (BIOPROCESS EQUIPMENT DESIGN & CAED-18BT62)

C310.1	Differentiate between different types of heat exchangers
C310.2	Know the different components of HE
C310.3	Do detailed design and drawing of DPHE, STHE and condenser
C310.4	Know the function of fermenter, packed column distillation
C310.5	Design and draw the fermenter, packed column distillation

Course Name: C311 (BIOINFORMATICS-18BT63)

C311.1	Know the relevant online resources, databases and software tools
C311.2	Analyse biological data using phylogenetic, predictive and comparative methods
C311.3	Apply alignment and modelling tools
C311.4	Design in silico various biomolecules
C311.5	Familiarize with tools and techniques of bioinformatics and they can apply these techniques to Health care and pharmacy industry.

Course Name: C312(FOOD PROCESS ENGINEERING -18BT641)

C312.1	Display a solid foundation in understanding the biochemical, nutritional, physiological, ethical and safety aspect of food
C312.2	Understand the factors influencing microbial growth, its intoxication and diagnostic system used in food industry to detect the microbial spoilage.
C312.3	To illustrate the different processing, preservative techniques to enhance the shelf life and production of food by fermentation processes using biotechnological approach.
C312.4	To analyse the different food sample for microbial contamination.

Course Name: C313 (JAVA PROGRAMMING-18BT653)

C313.1	Explain the object-oriented concepts and JAVA
C313.2	Develop computer programs to solve real world problems in Java.
C313.3	Develop simple GUI interfaces for a computer program to interact with users

Course Name: C314 (BPCA LAB-18BTL66)

C314.1	State and define the nature of the reaction, rate of the reaction, rate constant and enzyme activity.
C314.2	Compare the rate of reaction for different reactors; know the ethical responsibilities that come with conducting experiments and communicating data
C314.3	Use the design equations for predicting the reactor performance
C314.4	Compose the RTD data to identify non idealities in different reactor configuration
C314.5	Describe the principles of controllers
C314.6	To explain the concept of control of DO & agitation

Course Name: C315 (BIOINFORMATICS LAB-18BTL67)

C315.1	The students will be gaining expertise on practical data analytics, Data mining, machine

	learning.
C315.2	Utilize the biological information from public databases for given particular problem in biotechnology, medicine or biology.
C315.3	To gain foundational knowledge about molecular evolution, protein structure and gene expression using computational tools.
C315.4	Ability to write computer programs in various programming techniques to analyze bioinformatics data
C315.5	To apply the tools to address important problems of biotechnology and to verify the capability in handling a research project.
C315.6	The students will be able to visualize data and will apply this knowledge towards analysis of data related to graphical interfaces in the fields of systems biology ,functional genomics, and biomedicine

Course Name: C316 (MINI PROJECT – 18BT68)

C316.1	Identify a topic in relevant areas of Biotechnology
C316.2	Illustrate literature review to identify gaps and define objectives & scope of the work.
C316.3	Formulate the problem to meet the objectives of the proposed work
C316.4	Develop a prototypes/models, fabrication, experimental set-up/software systems necessary to meet the objectives
C316.5	Develop the work with a concern for society, environment and ethics

Course Name: C401 (BIOPROCESS ENGINEERING-18BT71)

C401.1	Study and design various statistical problems.
C401.2	Describe the factors affecting secondary metabolite production and its industrial importance.
C401.3	Identify and summarize the effect of change in unit's operations and its impact on the process.
C401.4	Illustrate how emerging technologies would benefit the bio chemical product recovery and show the likely benefits it would have over the traditional operations.
C401.5	Analyzing both analytical and process validation issues that are critical to successful manufacturing. Question

Course Name: C402 (CLINICAL & PHARMACEUTICAL BIOTECHNOLOGY-18BT72)

C402.1	To Explain the significance of pharmaco-kinetic models
C402.2	To Explain the significance of pharmaco-dynamic principles
C402.3	To understand various dosage forms and formulation
C402.4	To Understand the specific techniques used in biotherapy & clinical Biotechnology
C402.5	Comprehend specific applications of pharmaceutical & clinical Biotechnology

Course Name: C403 (PROCESS EQUIPMENT & PLANT DESIGN -18BT731)

C403.1	Acquire knowledge in the design of process of a chemical plant

C403.2	The students will be able to develop step by step procedure for plant design considering all the types of design procedure
C403.3	Able to evaluate the capital investments, manufacturing cost required for the process plant
C403.4	The students will be capable of analyzing the cost and time value of money
C403.5	Understand the concept of depreciation, Profitability and taxes

Course Name: C404 (BIOETHICS, BIOSAFETY & IPR -18BT741)

C404.1	The students are able to interpret the ethical issues of biotechnology
C404.2	The students will build the knowledge of biosafety principles followed in BT research
C404.3	The students can categorize the transgenic research on the basis of biosafety principles, apply biosafety regulations & principles in transgenic research
C404.4	The students will have the knowledge about safety release of GMOs into environment & PBR
C404.5	The students will be able to devise business strategies by taking account of IPRs

Course Name: C405 (ENERGY AND ENVIRONMENT -18ME751)

C405.1	Understand energy scenario, energy sources and their utilization
C405.2	Understand various methods of Thermal energy storage, energy management and economic analysis.
C405.3	Analyses the awareness about environment and eco system
C405.4	Understand the environment pollution and how to overcome
C405.5	Understand social issues and acts.

Course Name: C406 (BIOPROCESS ENGINEERING LABORATORY -18BTL76)

C406.1	Analyze and select appropriate unit operations for isolation and purification of bio molecules.
C406.2	Evaluate the bio-product using appropriate qualitative and quantitative analysis methods depending upon the chemical nature of analyte.
C406.3	Analyze, compare and select a technique for concentrating biological products like extraction, drying, filtration, precipitation, membrane separation.
C406.4	Acquire the basic principles and techniques of chromatography to purify the biological products.
C406.5	Describe the basic principles of fermentation preparation and the requirements of downstream processing for biochemical product recovery.
C406.6	Analyze the kinetics and estimation of product produced using fermenter

Course Name: C407 (PROJECT WORK PHASE – 1-18BTP77)

C407.1	Identify a topic in relevant areas of Biotechnology
C407.2	Illustrate literature review to identify gaps and define objectives & scope of the work.
C407.3	Formulate the problem to meet the objectives of the proposed work
C407.4	Develop a prototypes/models, fabrication, experimental set-up/software systems necessary to meet the objectives

C407.5	Develop the work with a concern for society, environment and ethics
C407.6	Analyze and discuss the results to draw valid conclusions.

Course Name: C408 (REGULATORY AFFAIRS IN BIOTECH INDUSTRY-18BT81)

C408.1	To educate students about regulatory rules governing biotech industry
C408.2	Outline the importance of the quality and compliance in the biotech industry
C408.3	Comprehend the various regulatory guidelines and rules as well as the organizations governing the same.
C408.4	To learn the documentation process pertaining to quality management, QA , quality policy and marketing.
C408.5	To understand the importance of quality auditing, process designing, validating master plans & commissioning

Course Name: C409 (INDUSTRIAL BIOTECHNOLOGY -18BT822)

C409.1	Understand the techniques used for the isolation, growth, identification, disinfection and sterilization of microorganisms used in the Industries
C409.2	Define the role of microorganisms towards environmental protection, industrial applications
C409.3	Out-line industrial fermentation processes leading to the production of antibiotics, organic acids, enzymes, vitamins and therapeutic products.

Course Name: C410 (PROJECT WORK PHASE - 2-18BTP83)

C410.1	Identify a topic in relevant areas of Biotechnology
C410.2	Illustrate literature review to identify gaps and define objectives & scope of the work.
C410.3	Formulate the problem to meet the objectives of the proposed work
C410.4	Develop a prototypes/models, fabrication, experimental set-up/software systems necessary to meet the objectives
C410.5	Develop the work with a concern for society, environment and ethics
C410.6	Analyze and discuss the results to draw valid conclusions.

Course Name: C411 (TECHNICAL SEMINAR -18BTS84)

C411.1	Enables to update with present technologies and trends in real world
C411.2	Enables to improve ability of data collection and presentation
C411.3	Enables to overcome stage fear and improve communication skills
C411.4	Enables to face spontaneous queries
C411.5	Prepare and write the report as per recommended format.
C411.6	Help to develop vocabulary & demonstrate efforts put in comprehensive analysis & interpretation of data

Course Name: C412(INTERNSHIP -18BTI85)

C412.1	Prior to graduation, look into other employment options. Integrate theory and practise in their field of study, as well as assess their interests and abilities.

C412.2	Develop communication, interpersonal, and other vital abilities, as well as acquire work experience.
C412.3	Enable students to develop work habits and positive attitude towards work in any organization
C412.4	Identify, write down, and carry out performance objectives relating to their job assignment with the consent of the employer and the team supervisor
C412.5	To integrate knowledge acquired through theory and lab into industrial use for higher order output

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DEPARTMENT OF CIVIL ENGINEERING

Course Name:C101(BMATE101-Mathematics-I for CIVIL Stream)

C101.1	Apply the knowledge of calculus to solve problems related to polar curves.
C101.2	Learn the notion of partial differentiation to compute rate of change of multivariate functions.
C101.3	Analyze the solution of linear and nonlinear ordinary differential equations
C101.4	Make use of matrix theory for solving the system of linear equations and compute eigenvalues and eigenvectors..
C101.5	Familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB/ PYTHON/SCILAB

Course Name:C102(BPHYC102-Physics Foe CIVIL Stream)

C102.1	Elucidate the concepts in oscillations, waves, elasticity and material failures
C102.2	Discuss the principles photonic devices and their application relevant to civil engineering
C102.3	Summarize concepts of acoustics in buildings and explain the concepts in radiation and photometry
C102.4	Practice working in groups to conduct experiments in physics and perform precise and honest measurements
C102.5	Describe the various natural hazards and safety precautions

Course Name: C103(BCIV103/ Engineering Mechanics)

C103.1	Compute the resultant of a force system and resolution of a force
C103.2	Comprehend the action for forces, moments, and other types of loads on rigid bodies and compute the reactive forces
C103.3	Analyze the frictional resistance offered by different planes
C103.4	Locate the centroid and compute the moment of inertia of sections
C103.5	Analyze the bodies in motion

Course Name:C104(BESCK104B- Introduction to Electrical Engineering)

C104.1	Understand the concepts of various energy sources and Electric circuits.
C104.2	Apply the basic Electrical laws to solve circuits.
C104.3	Discuss the construction and operation of various Electrical Machines.
C104.4	Identify suitable Electrical machine for practical implementation.
C104.5	Explain the concepts of electric power transmission and distribution, electricity billing, circuit protective devices and personal safety measures.

Course Name:C105(BPLCK105A- Introduction to Web Programming)

C105.2	Explain the historical context and justification for HTML over XHTML
C105.2	Develop HTML5 documents and adding various semantic markup tags
C105.2	Analyse various attributes, values and types of CSS
C105.2	Implement core constructs and event handling mechanisms of JavaScript.

Course Name:C105(BPLCK105B- Introduction to Python Programming)

C105.1	Demonstrate proficiency in handling loops and creation of functions
C105.2	Identify the methods to create and manipulate lists, tuples and dictionaries

C105.3	Develop programs for string processing and file organization
C105.4	Interpret the concepts of Object-Oriented Programming as used in Python

Course Name:C106(BENGK106-Communicative English)

C106.1	UNDERSTANDANDAPPLYTHEFUNDAMENTALSOFCOMMUNICATIONSKILLSINTHEIRCOMMUNICATIONSKILLS.
C106.2	IDENTIFYTHENUANCES OFPHONETICS,INTONATION ANDENHANCEPRONUNCIATION SKILLS.
C106.3	TOIMPARTBASICENGLISHGRAMMARANDESSENTIALS OFLANGUAGESKILLSASPERPRESENTREQUIREMENT.
C106.4	UNDERSTANDANDUSEALLTYPES OFENGLISHVOCABULARY ANDLANGUAGEPROFICIENCY
C106.5	ADOPTTHETECHNIQUESOF INFORMATIONTRANSFERTHROUGHPRESENTATION.

Course Name:C107(SAMSKRUTHIKA KANNADABKSKK107)

C107.1	ಕನ್ನಡ್ಡ□, □□ತ□ ಮಞ್ಞಾಕನ್ನಡದ □ಸಜೈೀರೀಯೀಕಞ್ಞಲಿಕಾಲಱತ್ತಾಂ.
C107.2	ಕನ್ನಡ □□ತ□ದಪ□ ಒನ್ನಗಿದಱಱಖಕಾವಠಿಮಞ್ಞಾಱಱಖಕಒವ□ಗಳಱ್ನ □ಂಂಈೀರೀಕಿಜಕಳಞ್ಞಾ□□ನಒಲ್ಡಮಞ್ಞಾಧ್ಯನಃಜೆ □ಒೀರೀಠಿಾಳತ್ತಾಂ.
C107.3	ಱಲ್□ ವ್ಯಠಿಗಳ್ಳ□ □□ತ□ ಮಞ್ಞಾ □ಸಜೈೀರೀಯಬಡ□ ಲಿಕಿ □ಟಱಸಒಯಱ್ನಗೈ□ ಞಾತ್ತಾಂ.
C107.4	ಞಂೀರೀ□ಕವ□ ಒಾಗಳಪಕಚಯ □ಟಱವಱ್ಳಗಳ □ಧ್ರ□ದಱಷಯಗಳಱ್ನೀರೀಂಕ್ಷಱಂಳಕಲನಇಖಿತರವ□ ಒಾಗಳಬಡ□ ೀರೀಂಕ್ಷಱಳ□ ಞಈಞಕ□ ಞೈ□ ಞಾತ್ತಾಂ.
C107.5	□ಂಂಸಜೈೀರೀಂಕ, ಜನಪದ□ಟಪ□ ಱಸಕಥನಗಳಪಕಚಯ□ಲಱಳಿಕ್ಷ.

Course Name:C107(BALAKE KANNADA-BKBKK107)

C107.1	To understand the necessity of learning of local language for comfortable life.
C107.2	To speak, read and write Kannada language as per requirement.
C107.3	To communicate (converse) in Kannada language in their daily life with kannada speakers.
C107.4	To Listen and understand the Kannada language properly.
C107.5	To speak in polite conservation.

Course Name:C108(Scientific Foundations of Health-BSFHK158)

C108.1	To understand and analyse about Health and wellness (and its Beliefs) & It's balance for positive mindset
C108.2	Develop the healthy lifestyles for good health for their better future.
C108.3	Build a Healthy and caring relationships to meet the requirements of good/social/positive life.
C108.4	To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future
C108.5	Prevent and fight against harmful diseases for good health through positive mindset.

CHILDREN'S EDUCATION SOCIETY (Regd.)
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(Recognised by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi.
Approved by A.I.C.T.E. New Delhi.
Recognised by UGC Under Section 2(f)
Bommanahalli, Hosur Road, Bangalore - 560 068.
Ph: 080-61754601/602, Fax: 080 - 25730551
E-mail: engprincipal@theoxford.edu Web: www.theoxfordengg.org

Course Name:C201(MATHEMATICS-II FOR CIVIL STREAM -BMATC201)

C201.1	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume.
C201.2	Understand the applications of vector calculus refer to solenoidal, and irrotational vectors.Orthogonal curvilinear coordinates.
C201.3	Demonstrate partial differential equations and their solutions for physical interpretations
C201.4	Apply the knowledge of numerical methods in analysing the discrete data and solving the physical and engineering problems.
C201.5	Get familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB /PYTHON/ SCILAB

Course Name:C202(-Applied Chemistry for CIVIL Stream)

C202.1	Identify the terms and processes involved in scientific and engineering applications
C202.2	Explain the methods of phenomena of chemistry to describe the engineering processes
C202.3	Solve for the problems in chemistry that are pertinent in engineering applications
C202.4	Apply the basic concepts of chemistry to explain the chemical properties and processes
C202.5	Analyse properties and processes associated with chemical substances in multidisciplinary situations

Course Name:C203(BCEDK203- Computer Aided Engineering Drawing)

C203.1	Draw and communicate the objects with definite shape and dimensions
C203.2	Recognize and Draw the shape and size of objects through different views
C203.3	Develop the lateral surfaces of the object
C203.4	Create a Drawing views using CAD software.
C203.5	***I***dentify the interdisciplinary engineering components or systems through its graphical representation.

Course Name:C204(BESCK204E-Introduction to C Programming)

C204.1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts
C204.2	Apply programming constructs of C language to solve the real world problem
C204.3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
C204.4	Explore user-defined data structures like structures, unions and pointers in implementing solutions
C204.5	Design and Develop Solutions to problems using modular programming constructs using functions

Course Name:C205(BETCK205H-Introduction to Internet of Things (IOT)

C205.1	Describe the evolution of IoT, IoT networking components, and addressing strategies in IoT
C205.2	Classify various sensing devices and actuator types.
C205.3	Demonstrate the processing in IoT.
C205.4	Explain Associated IOT Technologoes
C205.5	Illustrate architecture of IOT Applications

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Course Name:C206(BPWSK206-Professional Writing Skills in English)

C206.1	TO UNDERSTAND AND IDENTIFY THE COMMON ERRORS IN WRITING AND SPEAKING.
C206.2	TO ACHIEVE BETTER TECHNICAL WRITING AND PRESENTATION SKILLS.
C206.3	TO READ TECHNICAL PROPOSALS PROPERLY AND MAKE THEM TO WRITE GOOD TECHNICAL REPORTS.
C206.4	ACQUIRE EMPLOYMENT AND WORKPLACE COMMUNICATION SKILLS.
C206.5	TO LEARN ABOUT TECHNIQUES OF INFORMATION TRANSFER THROUGH PRESENTATION IN DIFFERENT LEVEL.

Course Name:C207(BICOK207-Indian Constitution)

C207.1	Analyse the basic structure of Indian Constitution.
C207.2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution
C207.3	know about our Union Government, political structure & codes, procedures.
C207.4	Understand our State Executive & Elections system of India.
C207.5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.

Course Name:C258 (BIDTK258-INNOVATION and DESIGN THINKING)

C258.1	Appreciate various design process procedure
C258.2	Generate and develop design ideas through different technique
C258.3	Identify the significance of reverse Engineering to Understand products
C258.4	Draw technical drawing for design ideas

Course Name:C201(21MAT31- Transform Calculus, Fourier Series and Numerical Techniques)

C201.1	To solve ordinary differential equations using Laplace transform.
C201.2	Demonstrate the Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
C201.3	To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations
C201.4	To solve mathematical models represented by initial or boundary value problems involving partial differential equations
C201.5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

Course Name: C232(21CV32 – Geodetic Engineering)

CO	Course Outcome (Student should be able)
232.1	Execute survey using compass and plane table
232.2	Find the level of ground surface and Calculation of area and volumes
232.3	Operate theodolite for field execution
232.4	Estimate the capacity of reservoir
232.5	Interpret satellite imageries

Course Name: C232(21CV33 - Strength of Materials)

C233.1	Evaluate the behaviour when a solid material is subjected to various types of forces (namely Compressive, Tensile, Thermal, Shear, flexure, Torque, internal fluid
C233.2	Estimate the forces developed and draw schematic diagram for stresses, forces, moments for simple beams with different types of support and are subjected to
C233.3	Evaluate the behaviour when a solid material is subjected to Torque and internal fluid pressure and estimate stresses and corresponding strain developed.
C233.4	Distinguish the behaviour of short and long column and calculate load at failure & explain the behaviour of spring to estimate deflection and stiffness
C233.5	Examine and Evaluate the mechanical properties of various materials under different loading conditions

Course Name: C234 (21CV34–Earth resource & Engineering)

C234.1	To inculcate the importance of earth's interior and application of Geology in civil engineering. Attempts are made to highlight the industrial applications of minerals.
C234..2	To create awareness among Civil engineers regarding the use of rocks as building materials.
C234..3	To provide knowledge on dynamic Geology and its importance in modifying the physical character of rocks which cause rocks suitable or unsuitable in different civil engineering projects such as Dams, bridges, tunnels and highways.
C234..4	To educate the ground water management regarding diversified geological formations, climatologically dissimilarity which are prevailed in the country. To highlight the concept of rain water harvesting.
C234.5	To understand the application of Remote Sensing and GIS, Natural disaster and management and environmental awareness.

Course Name: C235 (21CVL35 Computer Aided Building Planning & Drawing)

C235.1	Achieve skill sets to prepare computer aided engineering drawings
C235.2	Understand the details of construction of different building elements.
C235.3	Visualize the completed form of the building and the intricacies of construction based on the engineering drawings

Course Name: 21MAT41- Comlex Analysis, Probability and Statistical Methods

C241.1	Use the concept of analytic function and complex potential to solve the problem arising in electromagnetic field theory utilise conformal transformation and complex integral arising in aerofoil theory fluid flow, visualisation and image processing
C241.2	Obtain series solution of ordinary differential equations.
C241.3	Make a use of correlation and regression analyses to fit a suitable mathematical model for statistical data.
C241.4	Apply discrete and continuous probability distributions in analysing the probability models arising in the engineering fields.
C241.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis

Course Name: C242 (21CV42 Fluid Mechanics & Hydraulics)

C242.1	Understand fundamental properties of fluids and solve problems on Hydrostatics.
C242.2	Apply Principles of Mathematics to represent Kinematics and Bernoulli's principles.
C242.3	Compute discharge through pipes, notches and weirs.
C242.4	Design of open channels of various cross sections.
C242.5	Design of turbines for the given data and understand their operation characteristics.

Course Name: C243 (21CV43 Public Health Engineering)

C243.1	Estimate average and peak water demand for a community.
C243.2	Evaluate water quality and environmental significance of various parameters and plan suitable treatment system.
C243.3	Design the different units of water treatment plant.
C243.4	Acquire capability to conduct experiments and estimate the concentration of different parameters and compare the obtained results with the concerned guidelines and regulations.
C243.5	Estimate average and peak water demand for a community.

Course Name: C244 (21CV44 – Analysis Of structure)

C244.1	Evaluate slope and deflections in beams using geometrical methods.
C244.2	Determine deflections in trusses and frames using energy principles.
C244.3	Analyze arches and cables for stress resultants.
C244.4	Apply slope defection method in analyzing indeterminate structures and construct bending moment diagram.
C244.5	Analyze continuous beams, frames and trusses using stiffness matrix method of analysis.

Course Name: C246 (21CVL46 – Earth resource & Engineering Lab)

C246.1	To expose the students to identify the minerals and rocks based on their inherent properties and uses in civil engineering,
C246.2	To educate the students in the interpretation of the geological maps related to civil engineering projects.
C246.3	Students will learn the dip and strike, thickness of strata, Bore hole problems related to geological formation related to foundation, tunnels, reservoirs and mining.
C246.4	Students will understand the Field knowledge by visiting the site like problems Faults, Folds, Joints, Unconformity etc.

Course Name: C351 (18CV51 – Construction Management & Entrepreneurship)

C351.1	Understand the concept of planning, scheduling, cost and quality control, safety during construction, organization and use of project information necessary for construction project.
C351.2	Inculcate Human values to grow as responsible human beings with proper personality.
C351.3	Keep up ethical conduct and discharge professional duties.
C351.4	Establish as an ethical entrepreneur and establish an enterprise utilizing the provisions offered by the federal agencies
C351.5	analyze the economics of alternatives and evaluate benefits and profits of a construction activity based on monetary value and time value

Course Name: C352 (18CV52 – Analysis of Indeterminate Structures)

C352.1	Apply knowledge of mathematics and engineering in calculating slope, deflection, bending moment and shear force using slope deflection, moment distribution method and Kani's method.
C352.2	Identify, formulate and solve problems in structural analysis
C352.3	Analyze structural system and interpret data.
C352.4	Use the techniques, such as stiffness and flexibility methods to solve engineering problems.
C352.5	Communicate effectively in design of structural elements

Course Name: C353 (18CV53 – Design of RC Structural Elements)

C353.1	Identify, formulate and solve engineering problems of RC elements subjected to different kinds of loading.
C353.2	Follow a procedural knowledge in designing various structural RC elements..
C353.3	Impart the usage of codes for strength, serviceability and durability.
C353.4	Provide knowledge in analysis and design of RC elements.

Course Name: C354 (18CV54 – Basic Geotechnical Engineering

C354.1	Appreciate basic concepts of soil mechanics as an integral part in the knowledge of civil engineering.
C354.2	Comprehend basic engineering and mechanical properties of different types of soil.
C354.3	Become broadly familiar with geotechnical engineering problems such as, flow of water through soil medium and terminologies associated with geotechnical engineering.
C354.4	Assess the improvement in mechanical behavior by densification of soil deposits using compaction.
C354.5	Model and measure strength-deformation characteristics of soils.

Course Name: C355 (18CV55 – Municipal Wastewater Engineering)

C355.1	Understand the various water demands and population forecasting methods.
C355.2	Understand and design different unit operations and unit process in involved in wastewater treatment process.
C355.3	Understand the concept and design of various physicochemical treatment units.
C355.4	Understand the concept and design of various biological treatment units.
C355.5	Understand the concept of various advance waste water and low-cost treatment processes for rural areas.

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Course Name: C356 (18CV56 – Highway Engineering)

C356.1	Gain knowledge of different modes of transportation systems, history, development of highways and the organizations associated with research and development of the same in INDIA.
C356.2	Understand Highway planning and development considering the essential criteria's (engineering and financial aspects, regulations and policies, socio economic impact).
C356.3	Get insight to different aspects of geometric elements and train them to design geometric elements of a highway network.
C356.4	Understand pavement and its components, pavement construction activities and its requirements.
C356.5	Gain the skills of evaluating the highway economics by B/C, NPV, IRR methods and also introduce the students to highway financing concepts.

Course Name: C357 (18CVL57 – Surveying Practice)

C357.1	Apply the basic principles of engineering surveying and measurements.
C357.2	Follow effectively field procedures required for a professional surveyor.
C357.3	Use techniques, skills and conventional surveying instruments necessary for engineering practice.

Course Name: C358 (18CVL58 – Concrete and Highway Materials Laboratory)

C358.1	To learn the procedure of testing concrete ingredients and properties of concrete as per standard code recommendations.
C358.2	To learn the procedure of testing bituminous materials as per standard code recommendations.
C358.3	To relate material characteristics to various application of construction.

Course Name: C361 (18CV61 – Design of Steel Structural Elements)

C361.1	Understand advantages and disadvantages of steel structures, steel code provisions, and plastic behavior of structural steel.
C361.2	Learn Bolted connections and Welded connections.
C336.3	Design of compression members, built-up columns and columns splices.
C361.4	Design of tension members, simple slab base and gusseted base.
C361.5	Design of laterally supported and un-supported steel beams.

Course Name: C363 (18CV63-Hydrology and Irrigation Engineering)

C363.1	Understand the concept of hydrology and components of hydrologic cycle such as precipitation, infiltration, evaporation and transpiration
C363.2	Quantify runoff and use concept of unit hydrograph.
C363.3	Demonstrate different methods of irrigation, methods of application of water and irrigation procedure
C363.4	Design canals and canal network based on the water requirement of various crops.
C363.5	Determine the reservoir capacity.

Course Name: C362 (18CV62 – Applied Geotechnical Engineering)

362.1	Appreciate basic concepts of soil mechanics as an integral part in the knowledge of Civil Engineering. Also, to become familiar with foundation engineering terminology and understand how the principles of Geotechnology are applied in the design of foundations.
C362.2	Learn introductory concepts of Geotechnical investigations required for civil engineering projects emphasizing in situ investigations.
C362.3	Conceptually learn various theories related to bearing capacity of soil and their application in the design of shallow foundations and estimation of load carrying capacity of pile foundation.
C362.4	Estimate internal stresses in the soil mass and application of this knowledge in proportioning of shallow and deep foundation fulfilling settlement criteria.
C362.5	Study about assessing stability of slopes and earth pressure on rigid retaining structures.

Course Name: C364(18CV642- Solid Waste Management)

C364.1	Study the present methods of solid waste management system and to analyze their draw backs comparing with statutory rules.
C364.2	Understand different elements of solid waste management from generation of solid waste to disposal.
C364.3	Analyze different processing technologies and to study conversion of municipal solid waste to compost or biogas.
C364.4	Evaluate landfill site and to study the sanitary landfill reactions.

Course Name: C365 (18ME657 Non-Conventional Energy Sources)

C365.1	Describe the environmental aspects of non-conventional energy resources. In Comparison with various conventional energy systems, their prospects and limitations.
C365.2	Know the nCVd of renewable energy resources, historical and latest developments
C365.3	Describe the use of solar energy and the various components used in the energy production with respect to applications like heating, cooling, desalination, power generation, drying, cooking etc.
C365.4	Appreciate the nCVd of Wind Energy and ocean and tidal energy the various components used in energy generation and know the classifications
C365.5	Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications
C365.6	Acquire the knowledge of fuel cells, OTEC and geothermal principles and applications Compare Solar, Wind and bio energy systems, their prospects, Advantages and limitations.

Course Name: C366 (18CVL66 – Software Application Laboratory)

C366.1	Use industry standard software in a professional set up. 2. Understand the elements of finite element modeling, specification of loads and boundary condition, performing analysis and interpretation of results for final design. 3. Develop customized automation tools.
C366.2	Understand the elements of finite element modeling, specification of loads and boundary condition, performing analysis and interpretation of results for final design.
C366.3	Develop customized automation tools.

Course Name: C367 (18CVL67 – Environmental Engineering Laboratory)

C367.1	To learn different methods of water & waste water quality.
C367.2	To conduct experiments to determine the concentrations of water and waste water
C367.3	To determine the degree and type of treatment
C367.4	To understand the environmental significance and application in environmental engineering practice.

Course Name: C368 (18CVEP68 – Extensive Survey project)

C368.1	Understand the practical applications of Surveying.
C368.2	Use Total station and other Measurement Equipments.
C368.3	Work in teams and learn time management, communication and presentation skills.

Course Name: C471 (18CV71 - Quantity Surveying and Contracts Management)

C471.1	Estimate the quantities of work, develop the bill of quantities and arrive at the Cost of civil engineering Project.
C471.2	Understand and apply the concept of Valuation for Properties
C471.3	Understand, Apply and Create the Tender and Contract document.
C471.4	Prepare valuation reports of buildings.
C471.5	Interpret Contract documents of domestic and international construction works

Course Name: C472 (18CV72 - Design of RCC and Steel Structures)

C472.1	Provide basic knowledge in the areas of limit state method and concept of design of RC and Steel structures.
C472.2	Identify, formulate and solve engineering problems in RC and Steel Structures.
C472.3	Give procedural knowledge to design a system, component or process as per needs and specifications of RC Structures like Retaining wall, Footing, Water tanks, Portal Frames and Steel Structures like Roof Truss, Plate Girder and Gantry Girder.
C472.4	Imbibe the culture of professional and ethical responsibilities by following codal provisions in the analysis, design of RC and Steel Structures.
C472.5	Provide factual knowledge on analysis and design of RC Structural elements, who can participate and succeed in competitive examinations.

Course Name: C473 (18CV73 – Ground Water & Hydraulics)

C473.1	To characterize the properties of ground water and aquifers..
C473.2	To quantify the ground water flow.
C473.3	To synthesize ground water development methods.
C473.4	Find the characteristics of aquifers.
C473.5	Estimate the quantity of ground water by various methods

Course Name: C474 (18CV745 – Urban Transportation and Planning)

C474.1	Understand and apply basic concepts and methods of urban transportation planning
C474.2	Apprise about the methods of designing, conducting and administering surveys to provide the data required for transportation planning.
C474.3	Understand the process of developing an organized mathematical modelling approach to solve select urban transportation planning problem
C474.4	Excel in use of various types of models used for travel forecasting, prediction of future travel patterns.
C474.5	Understand and apply basic concepts and methods of urban transportation planning

Course Name: C476 (18CVL76- Computer Aided Detailing of Structures)

C476.1	Be aware of the Scale Factors, Sections of drawings,
C476.2	Draft the detailing of RC and Steel Structural member.
C476.3	Prepare detailed working drawings

Course Name: C477 (18CVL77- Geotechnical Engineering Lab)

C477.1	Appreciate basic concepts of soil mechanics as an integral part in the knowledge of civil engineering.
C477.2	Comprehend basic engineering and mechanical properties of different types of soil.
C477.3	Become broadly familiar with geotechnical engineering problems such as, flow of water through soil medium and terminologies associated with geotechnical engineering.
C477.4	Assess the improvement in mechanical behavior by densification of soil deposits using compaction.
C477.5	Model and measure strength-deformation characteristics of soils.

Course Name: C478 (18CVP78-Project Work)

C478.1	Demonstrate a sound technical knowledge of their selected project topic
C478.2	Undertake problem identification & formulation and solution
C478.3	Design engineering solutions to complex problems utilizing a systems approach
C478.4	Communicate with Engineering and the community at large in written an oral form
C478.5	Designing a solution taking into consideration of economical & social responsibilities
C478.6	Providing suitable path towards lifelong learning skills

Course Name: C481 (18CV81 - Design of Pre-Structure)

C481.1	This course will enable students to learn Design of Pre-Stressed Concrete Elements
C481.2	Analyze the stresses encountered in PSC element during transfer and at working
C481.3	Understand the effectiveness of the design of PSC after studying losses
C481.4	Capable of analyzing the PSC element and finding its efficiency.
C481.5	Design PSC beam for different requirements.

Course Name: C482 (18CV824- Rehabilitation & Retrofitting)

C482.1	Identify the causes for structural (Concrete) deterioration.
C482.2	Assess the type and extent of damage and carry out damage assessment of structures through various types
C482.3	of tests.
C482.4	Understand the effects of climate on buildings and know the corrosion protection system.
C482.5	Recommend maintenance requirements of the buildings and preventive measures against influencing

Course Name: C483 (18CVP83-Project Work)

C483.1	Demonstrate a sound technical knowledge of their selected project topic
C483.2	Undertake problem identification & formulation and solution
C483.3	Design engineering solutions to complex problems utilizing a systems approach
C483.4	Communicate with engineers and the community at large in written an oral form
C483.5	Designing a solution taking into consideration of economical & social responsibilities
C483.6	Providing suitable path towards lifelong learning skills

Course Name: C484 (18CVS84 Seminar)

C484.1	Attain, use and develop knowledge in the field of electrical and electronics engineering and other disciplines through independent learning and collaborative study
C484.2	Identify, understand and discuss current, real-time issues
C484.3	Improve oral and written communication skills
C484.4	Explore an appreciation of the self in relation to its larger diverse social and academic contexts.
C484.5	Apply principles of ethics and respect in interaction with others

Course Name: C485 (18CVI85- Internship)

COURSE CODE	**COURSE OUTCOME**
C485.1	Gain practical experience within industry in which the internship is done
C485.2	Apply knowledge and skills learned to classroom work
C485.3	Develop a greater understanding about career options while more clearly defining personal career goals
C485.4	Develop and refine oral and written communication skills.
C485.5	Expand intellectual capacity, credibility, judgment, intuition.
C485.6	Acquire the knowledge of administration, marketing, finance and economics

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Course Name: C101 (BMATS101- Mathematics-I For Cse Stream)

C101.1	Apply the knowledge of calculus to solve problems related to polar curves and learn the notion of partial differentiation to compute rate of change of multivariate functions
C101.2	Analyze the solution of linear and nonlinear ordinary differential equations.
C101.3	Get acquainted and to apply modular arithmetic to computer Algorithms.
C101.4	Make use of matrix theory for solving the system of linear equations and compute eigenvalues and eigenvectors
C101.5	Familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/ PYTHON/ SCILAB.

Course Name: C102 (BPHYS102- Physics for CSE stream)

C102.1	Describe the principles of LASERS and Optical fibers and their relevant applications.
C102.2	Discuss the basic principles of the Quantum Mechanics and its application in Quantum Computing.
C102.3	Summarize the essential properties of superconductors and applications in Quantum Computing.
C102.4	Illustrate the application of physics in design and data analysis.
C102.5	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

Course Name: C103 (BPOPS103- Principles of Programming Using C)

C103.1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts
C103.2	Apply programming constructs of C language to solve the real world problem
C103.3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
C103.4	Explore user-defined data structures like structures, unions and pointers in implementing solutions

Course Name: C104 (BESCK104C - Introduction to Electronics Communication)

C104.1	Describe the concept of electronic circuits encompassing power supplies, amplifiers and oscillators.
C104.2	Describe the characteristics and application of operational amplifiers
C104.3	Present the basics of digital logic engineering including data representation, Boolean algebra and design of Combinational logic design using basic gates
C104.4	Discuss the characteristics, technological advances of embedded systems and role of sensors and actuators in instrumentation and control
C104.5	Explain the fundamentals of communication engineering and different modes of communications

Course Name: C105 (BETCK105H - Introduction to Internet of Things (IOT))

C105.1	Describe the evolution of IoT, IoT networking components, and addressing strategies in IoT
C105.2	Classify various sensing devices and actuator types.
C105.3	Demonstrate the processing in IoT.
C105.4	Explain Associated IOT Technologoes
C105.5	Illustrate architecture of IOT Applications

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Course Name: C106 (BENGK106- Communicative English)

C106.1	Understand and apply the fundamentals of communication skills in their communication skills.
C106.2	Identify the nuances of phonetics, intonation and enhance pronunciation skills.
C106.3	To impart basic English grammar and essentials of language skills as per present requirement.
C106.4	Understand and use all types of English vocabulary and language proficiency
C106.5	Adopt the techniques of information transfer through presentation.

Course Name: C107 (BICOK107- Indian Constitution)

C107.1	Analyse the basic structure of Indian Constitution.
C107.2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution
C107.3	know about our Union Government, political structure & codes, procedures.
C107.4	Understand our State Executive & Elections system of India.
C107.5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.

Course Name: C108 (BIDTK158-Innovation and Design Thinking)

C108.1	Appreciate various design process procedure
C108.2	Generate and develop design ideas through different technique
C108.3	Identify the significance of reverse Engineering to Understand products
C108.4	Draw technical drawing for design ideas

Course Name: C111 (BMATS201-Mathematics for CSE Stream –II)

C111.1	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume.
C111.2	Understand the applications of vector calculus refer to solenoidal, and irrotational vectors. Orthogonal curvilinear coordinates.
C111.3	Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation
C111.4	Apply the knowledge of numerical methods in analyzing the discrete data and solving the physical and engineering problems.
C111.5	Get familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB /PYTHON/ SCILAB

Course Name: C112 (BCHES202-Chemistry for CSE Stream)

C112.1	Identify the terms and processes involved in scientific and engineering applications
C112.2	Explain the methods of phenomena of chemistry to describe the engineering processes
C112.3	Solve for the problems in chemistry that are pertinent in engineering applications
C112.4	Apply the basic concepts of chemistry to explain the chemical properties and processes
C112.5	Analyse properties and processes associated with chemical substances in multidisciplinary situations

Course Name: C113 (BCEDK203-Computer-Aided Engineering Drawing)

C113.1	Draw and communicate the objects with definite shape and dimensions
C113.2	Recognize and Draw the shape and size of objects through different views

C113.3	Develop the lateral surfaces of the object
C113.4	Create a Drawing views using CAD software.
C113.5	***I***dentify the interdisciplinary engineering components or systems through its graphical representation.

Course Name: C114 (BESCK204B -Introduction to Electrical Engineering)

C114.1	Understand the concepts of various energy sources and Electric circuits.
C114.2	Apply the basic Electrical laws to solve circuits.
C114.3	Discuss the construction and operation of various Electrical Machines.
C114.4	Identify suitable Electrical machine for practical implementation.
C114.5	Explain the concepts of electric power transmission and distribution, electricity billing, circuit protective devices and personal safety measures.

Course Name: C115 (BPLCK205C- Basics to JAVA programming)

C115.1	To explain the features and object oriented concepts in JAVA programming
C115.2	To analyse working of bitwise operators in JAVA
C115.3	To develop simple programs based on polymorphism and inheritance
C115.4	To describe the concepts of importing packages and exception handling mechanism

Course Name: C116 (BPWSK206-Professional Writing Skills in English)

C116.1	To understand and identify the common errors in writing and speaking.
C116.2	To achieve better technical writing and presentation skills.
C116.3	To read technical proposals properly and make them to write good technical reports.
C116.4	Acquire employment and workplace communication skills.
C116.5	To learn about techniques of information transfer through presentation in different level.

Course Name: C117 (BKSKK207-Samskrutika Kannada)

C117.1	ಕನ್ನಡ□, □□ತ□ ಮಾತ್ರ ಕನ್ನಡದ □ಸಜೈ೦ರ೦ಯ ೨ಕಾ ಅಗಿಾಲಷತ್ರ ೦.
C117.2	ಕನ್ನಡ □□ತ□ದ ಪ□ ಲನ್ನಗಿದ ಆಜಾಖಿಕ ಶವಶ ಮಾತ್ರ ಆಜಾಖಿಕ ಒವ□ಗಳಷ್ಟ □೦೨೦ರ೦ಕಿಜ ಕಲಾ ನ□□ನ ಓಲ್ಡಡ ಮಾತ್ರ ೧ನಃಜೆ □ಒ ೦ರ೦ಶಿಾಳತ್ರ ೦.
C117.3	ಟಿ□ ವ್ಯಾಗಳಲ□ □□ತ□ ಮಾತ್ರ □ಸಜೈ೦ರ೦ಯ ಬಡ□ ಅಗಿ □ಟಿಆಸಒ೨ಯಷ್ಟ ನೈ□ ಇತ್ರ ೦.
C117.4	೫೦೦ರ೦□ಕ ವ□ ಒ೨ಗಳ ಪಈಚಯ □ಟಿಅವಷ್ಟಗಳ □ಲ೨□ದ ಆಷಯಗಳಷ್ಟ ೦ರ೦್ಕಿಆ೦ಳ ಕಾಲನ ಇಖಒತರ ವ□ ಒ೨ಗಳ ಬಡ□ ೦ರ೦್ಕಿಆಳ□ ಗ ಈಾಕ□ ನೈ□ ಇತ್ರ ೦.
C117.5	□೦೦ಸಜೈ೦ರ೦ಕ, ಜನಪದ□ಟಿಪ□ ಿಸ ಕಥನಗಳ ಪಈಚಯ□ಲಆಳಗಿಕಿ.

Course Name: C118 (BKBKK207- Balake Kannada)

C118.1	To understand the necessity of learning of local language for comfortable life.
C118.2	To speak, read and write Kannada language as per requirement.
C118.3	To communicate (converse) in Kannada language in their daily life with kannada speakers.
C118.4	To Listen and understand the Kannada language properly.

C118.5	To speak in polite conservation.

Course Name: C119 (BSFHK258-Scientific Foundations for Health)

C119.1	To understand and analyse about Health and wellness (and its Beliefs) & It's balance for positive mindset
C119.2	Develop the healthy lifestyles for good health for their better future.
C119.3	Build a Healthy and caring relationships to meet the requirements of good/social/positive life.
C119.4	To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future
C119.5	Prevent and fight against harmful diseases for good health through positive mindset.

Course Name: C201 (Transform Calculus, Fourier Series and Numerical Techniques - 21MAT31)

C201.1	To solve ordinary differential equations using Laplace transform.
C201.2	Demonstrate Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing and field theory.
C201.3	To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations
C201.4	To solve mathematical models represented by initial or boundary value problems involving partial differential equations
C201.5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

Course Name: C202 (Data Structures and Applications - 21CS32)

C202.1	Identify different data structures and their applications.
C202.2	Apply stack and queues in solving problems.
C202.3	Demonstrate applications of linked list.
C202.4	Explore the applications of trees and graphs to model and solve the real-world problem.
C202.5	Make use of Hashing techniques and resolve collisions during mapping of key value pairs

Course Name: C203 (Analog and Digital Electronics - 21CS33)

C203.1	Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC and op-amp.
C203.2	Explain the basic principles of A/D and D/A conversion circuits and develop the same.
C203.3	Simplify digital circuits using Karnaugh Map, and Quine-McClusky Methods
C203.4	Explain Gates and flip flops and make us in designing different data processing circuits, registers and counters and compare the types.
C203.5	Develop simple HDL programs

Course Name: C204 (Computer Organization and Architecture - 21CS34)

C204.1	Explain the organization and architecture of computer systems with machine instructions and programs
C204.2	Analyze the input/output devices communicating with computer system
C204.3	Demonstrate the functions of different types of memory devices

C204.4	Apply different data types on simple arithmetic and logical unit
C204.5	Analyze the functions of basic processing unit, Parallel processing and pipelining

Course Name: C205 (Object Oriented Programming with JAVA Laboratory - 21CSL35)

C205.1	Use Eclipse/NetBeans IDE to design, develop, debug Java Projects
C205.2	Analyze the necessity for Object Oriented Programming paradigm over structured programming and become familiar with the fundamental concepts in OOP.
C205.3	Demonstrate the ability to design and develop java programs, analyze, and interpret object-oriented data and document results.
C205.4	Apply the concepts of multiprogramming, exception/event handling, abstraction to develop robust programs.
C205.5	Develop user friendly applications using File I/O and GUI concepts.

Course Name: C206 (Mastering Office-21CSL381)

C206.1	Know the basics of computers and prepare documents, spreadsheets, make small presentations with audio, video and graphs and would be acquainted with internet.
C206.2	Create, edit, save and print documents with list tables, header, footer, graphic, spellchecker, mail merge and grammar checker
C206.3	Attain the knowledge about spreadsheet with formula, macros spell checker etc.
C206.4	Demonstrate the ability to apply application software in an office environment.
C206.5	Use Google Suite for office data management tasks

Course Name: C207 (Social Connect and Responsiblity- 21SCR36)

C207.1	Understand social responsibility
C207.2	Practice sustainability and creativity
C207.3	Showcase planning and organizational skills

Course Name:C208(SAMSKRUTIKA KANNADA-21KSK37)

C208.1	Kannada language, literature and Kannada culture will be introduced.
C208.2	Interest in pre- modern and modern poetry and culture of Kannada literature arises.
C208.3	Introduction of technical persons.
C208.4	Kannada grammar, general Kannada and administrative Kannada words will be introduced.

Course Name:C208(BALAKE KANNADA-21KBK37)

C207.1	To understand the necessity of learning of local language for comfortable life.
C207.2	To Listen and understand the Kannada language properly.
C207.3	To speak, read and write Kannada language as per requirement.
C207.4	To communicate (converse) in Kannada language in their daily life with kannada speakers.
C207.5	To speak in polite conservation.

Course Name: C209 (Constitution of India and Professional Ethics-21CIP37)

C208.1	Analyse the basic structure of Indian Constitution.
C208.2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.
C208.3	know about our Union Government, political structure & codes, procedures.
C208.4	Understand our State Executive & Elections system of India.
C208.5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution

Course Name: C301 (Management And Entrepreneurship For It Industry-18CS51)

C301.1	Define management, organization, entrepreneur, planning, staffing
C301.2	Outline the importance of controlling and coordinating
C301.3	Understand the importance of entrepreneur
C301.4	Utilize the resources available effectively through ERP
C301.5	Make use of IPRs and institutional support in entrepreneurship

Course Name: C302 (Computer Network and Security-18CS52)

C302.1	Demonstration of Application layer protocols
C302.2	Discuss transport layer services and understand UDP and TCP protocols
C302.3	Explain routers, IP and routing algorithms in network layer
C302.4	Disseminate the wireless and mobile networks covering IEEE 802.11 standard.
C302.5	Illustrate concepts of multimedia networking, security and network management

Course Name: C303 (Database Management System-18CS53)

C303.1	Apply fundamentals of database concept and entity relationship model in database applications.
C303.2	Design a database using RDBMS and use this for database applications.
C303.3	Design and develop database and database in Internet Applications.
C303.4	Design database using normalization.
C303.5	Understanding the transaction processing and recovery methods in database.

Course Name: C304 (Automata theory and Computability-18CS54)

C304.1	Demonstrate proficiency in handling of loops and creation of functions
C304.2	Identify the methods to create and manipulate lists, tuples and dictionaries.
C304.3	Discover the commonly used operations involving regular expressions and file system.
C304.4	Interpret the concepts of Object-Oriented Programming as used in Python.
C304.5	Determine the need for scraping websites and working with CSV, JSON and other file formats

Course Name: C305 (Application Development using Python-18CS55)

C305.1	Demonstrate proficiency in handling of loops and creation of functions
C305.2	Identify the methods to create and manipulate lists, tuples and dictionaries.
C305.3	Discover the commonly used operations involving regular expressions and file system.

C305.4	Interpret the concepts of Object-Oriented Programming as used in Python.
C305.5	Determine the need for scraping websites and working with CSV, JSON and other file formats

Course Name: C306 (UNIX Programming-18CS56)

C306.1	Explain Unix Architecture, File system and use of Basic Commands
C306.2	Illustrate Shell Programming and to write Shell Scripts
C306.3	Categorize, compare and make use of Unix System Calls
C306.4	Signals APIs to interrupt the process using suitable programs.
C306.5	Build an application/service over a Unix system.

Course Name: C307 (Computer Networks laboratory-18CSL57)

C307.1	Evaluate the performance of Ethernet LAN and Wireless LAN throughSimulation.
C307.2	Evaluate the performance of GSM and CDMA model through simulation.
C307.3	Develop java programs for CRC and RSA algorithms.
C307.4	Develop java programs for Bellman-ford and leaky bucket algorithms, Socket programming using TCP and UDP.

Course Name: C308 (DBMS laboratory and mini project-18CSL58)

C308.1	Use Structured Query Language (SQL) for database Creation and manipulation.
C308.2	Demonstrate the working of different concepts of DBMS.
C308.3	Construct a database by using data definition, data manipulation and control languages.
C308.4	Design and test the project developed for an application.

Course Name: C309 (Environmental Studies-18CIV59)

C309.1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale
C309.2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
C309.3	Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components.
C309.4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.

Course Name: C401 (Artificial Intelligence & Machine Learning-18CS71)

C401.1	Explain the structure and functionality of operating system
C401.2	Apply appropriate CPU scheduling algorithms for the given problem
C401.3	Analyze the various techniques for process synchronization and deadlock handling
C401.4	Apply various technique for memory management
C401.5	Explain file and secondary storage management strategies
C401.6	Describe the need for information protection mechanisms

Course Name: C402 (Big Data Analytics-18CS72)

C402.1	Understand the fundamentals of Big Data Analytics.
C402.2	Investigate Hadoop Distribution framework and Hadoop Distribution Framework.

C402.3	Illustrate the concepts of NOSQL using Mongo DB and Cassandra Database.
C402.4	Demonstrate the Map Reduce Programming model to process the Big data along with Hadoop tools.
C402.5	Use Machine Learning algorithms for real world Big Data. Analyze web contents and social networks to provide analytics with relevant visualization tools.

Course Name: C403 (User Interface Design-18CS734)

C403.1	Understand Importance and Characteristics of User interface design
C403.2	Understand User Interface Design process and Business functions
C403.3	Apply System menus ,navigation schemes and windows characteristics
C403.4	Understand screen based controls and device based controls
C403.5	Design the prototypes and test plans of user interface

Course Name: C404 (Cryptography-18CS744)

C404.1	Define cryptography and its principles.
C404.2	Explain Cryptography algorithms.
C404.3	Illustrate Public and Private key cryptography.
C404.4	Explain Key management, distribution and certification.
C404.5	Explain authentication protocols.
C404.6	Tell about IPSec.

Course Name: C405 (Disasters Management-18EE753)

C405.1	Discuss disaster management plan, cyclones, and their hazard potential
C405.2	Understand the role of IMD and cyclone prediction and cyclone warning systems in India
C405.3	Understand the role of different institutions' defense and other services in natural disaster management.
C405.4	Understand the role of the Central Water Commission in river water sharing, Draught, its assessment and draught management plan
C405.5	Understand occurrence of earth quake, Tsunamis and thunderstorms.

Course Name: C406 (Artificial Intelligence and Machine Learning Laboratory-18CSL76)

C406.1	Implement and demonstrate AI and ML algorithms.
C406.2	Design Java/Python programs for various Learning algorithms.
C406.3	Apply appropriate data sets to the Machine Learning algorithms.
C406.4	Identify and apply Machine Learning algorithms to solve real world problems.
C406.5	Evaluate different algorithms.

Course Name: C407 (Project Work Phase–I - 18CSP77)

C407.1	Analyze the problem, formulation, and solution of the selected project.
C407.2	Develop solutions for contemporary problems using modern tools for sustainable development.
C407.3	Apply ethical and professional sustainability while working in a team and communicate effectively for the benefit of society.

C407.4	Understand the engineering, finance, and management principles.

Course Name: C211 (Mathematical Foundations for computing- 21CS41)

C211.1	Apply the concepts of logic for effective computation and relating problems in the Engineering domain
C211.2	Analyse the concepts of functions and relations to various fields of engineering. Comprehend the concepts of Graph Theory for various applications of Computational sciences
C211.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in the engineering field.
C211.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data
C211.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.

Course Name: C212 (Design and Analysis of Algorithms-21CS42)

C212.1	Understand the design principles, concepts of algorithm design and methods for analysing the efficiency of algorithms using time and space complexity theory
C212.2	Design and analyse problem solving using divide and conquer strategy
C212.3	Apply greedy method to solve problems to find an optimal solution
C212.4	Apply dynamic programming to solve problems using the solutions of similar subproblems
C212.5	Design and apply backtracking technique for problem solving

Course Name: C213 (Microcontroller and Embedded Systems-21CS43)

C213.1	Explain C-Compilers and optimization
C213.2	Describe the ARM microcontroller's architectural features and program module.
C213.3	Apply the knowledge gained from programming on ARM to different applications.
C213.4	Program the basic hardware components and their application selection method
C213.5	Demonstrate the need for a real-time operating system for embedded system applications.

Course Name: C214 (Operating Systems-21CS44)

C214.1	Identify the structure of an operating system and its scheduling mechanism
C214.2	Demonstrate the allocation of resources for a process using scheduling algorithm.
C214.3	Identify root causes of deadlock and provide the solution for deadlock elimination
C214.4	Explore about the storage structures and learn about the Linux Operating system
C214.5	Analyze Storage Structures and Implement Customized Case study.

Course Name: C215 (Biology for Engineers-21BE45)

C215.1	Elucidate the basic biological concepts via relevant industrial applications and case studies.
C215.2	Evaluate the principles of design and development, for exploring novel bioengineering projects.
C215.3	Corroborate the concepts of biomimetic for specific requirements.

C215.4	Think critically towards exploring innovative bio based solutions for socially relevant problems

Course Name: C216 (Python Programming Laboratory-21CSL46)

C216.1	Demonstrate proficiency in handling of loops and creation of functions.
C216.2	Identify the methods to create and manipulate lists, tuples and dictionaries.
C216.3	Discover the commonly used operations involving regular expressions and file system.
C216.4	Interpret the concepts of Object-Oriented Programming as used in Python.
C216.5	Determine the need for scraping websites and working with PDF, JSON and other file formats

Course Name: C217 (Web Programming-21CSL481)

C217.1	Describe the fundamentals of web and concept of HTML
C217.2	Use the concepts of HTML, XHTML to construct the web pages.
C217.3	Interpret CSS for dynamic documents.
C217.4	Evaluate different concepts of JavaScript & Construct dynamic documents.
C217.5	Design a small project with JavaScript and XHTML.

Course Name: C219(Universal Human Values-21UH49)

C219.1	Explore Holistic vision of life –themselves and their surroundings
C219.2	Develop Competence and capabilities for maintaining Health and Hygiene
C219.3	Analyze various problems in life, family ,society and in handling problems with Sustainable solutions
C219.4	Apply values to their own self in different day-to- day settings in real life and in handling in real life and in handling problems with sustainable solutions
C219.5	Adopt the value of appreciation and aspiration for excellence and gratitude for all.

Course Name: C311 (System Software and Compilers-18CS61)

C311.1	Illustrate system software such as assemblers and loaders
C311.2	Study the different phases of compiler and construct the Lexical Analyser.
C311.3	Design and apply top down and bottom-up parsing technique for problem solving.
C311.4	Utilize lex and yacc tools for implementing different concepts of system software
C311.5	Design and Apply techniques of Syntax directed translations, Intermediate code generation and Code generation.

Course Name: C312 (Computer Graphics and Visualization-18CS62)

C312.1	Design and implement algorithms for 2D graphics primitives and attributes
C312.2	Illustrate Geometric transformations on both 2D and 3D objects.
C312.3	Apply concepts of clipping and visible surface detection in 2D and 3Dobjects
C312.4	Decide suitable hardware and software for developing graphics packages using OpenGL.
C312.5	Illustrate interactive programming using various Graphical packages

Course Name: C313 (Web Technology and Its Applications-18CS63)

C313.1	Illustrate the Semantic Structure of HTML and CSS.

C313.2	Demonstrate forms and tables using HTML and CSS.
C313.3	Develop Client-Side programs using JavaScript and Server-Side programs using PHP.
C313.4	Outline Object Oriented Programming capabilities of PHP.
C313.5	Examine JavaScript frameworks such as jQuery and Backbone.

Course Name: C314 (Cloud computing-18CS643)

C314.1	Explain cloud computing, and virtualization and classify services of cloud computing
C314.2	Illustrate architecture and programming in the cloud
C314.3	Interpret the importance of concurrent programming and high-throughput computing
C314.4	Illustrate the importance of data-intensive computing using Map reduce Programming
C314.5	Describe the platforms for the development of cloud applications and List the application of the cloud.

Course Name: C315 (Non-Conventional Energy Sources-18ME651)

C315.1	Describe the environmental aspects of non-conventional energy resources. In Comparison with various conventional energy systems, their prospects and limitations.
C315.2	Know the need of renewable energy resources, historical and latest developments.
C315.3	Describe the use of solar energy and the various components used in the energy production with respect to applications like-heating, cooling, desalination, power generation, drying, cooking etc.
C315.4	Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications.
C315.5	Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications
C315.6	Compare Solar, Wind and bio energy systems, their prospects, Advantages and limitations.
C315.7	Acquire the knowledge of fuel cells, wave power, tidal power and geothermal principles and applications.

Course Name: C316 (System Software Lab-18CSL66)

C316.1	Develop LEX and YACC programs for lexical and syntax analysis phases of Compiler.
C316.2:	Develop programs for top down and bottom-up parsing.
C316.3	Develop C program for CPU scheduling and generating machine code using triples.
C316.4	Develop C programs for deadlock handling and page replacement algorithms.

Course Name: C317 (Computer Graphics Laboratory with Mini Project-18CSL67)

C317.1	Apply the concepts of Computer Graphics.
C317.2	Implement Computer Graphics Applications using OpenGL.
C317.3	Animate real world scenario using OpenGL
C317.4	Implement different Line drawing and clipping algorithms.
C317.5	Transform 2D and 3D geometric objects.

Course Name: C318 (Mobile Application Development-18CSMP68)

C318.1	Learn and acquire the art of Android Programming.

C318.2	Configure Android studio to run the applications.
C318.3	Understand and implement Android's User interface functions.
C318.4	Create, modify and query on SQLite database and Inspect different methods of sharing data using services

Course Name: C411 (Internet Of Things-18CS81)

C411.1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.
C411.2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
C411.3	Appraise the role of IoT protocols for efficient network communication.
C411.4	Elaborate the need for Data Analytics and Security in IoT.
C411.5	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.

Course Name: C412 (Storage Area Networks-18CS822)

C412.1	Identify key challenges in managing information and analyze different storage networking technologies and virtualization
C412.2	Explain components and the implementation of NAS
C412.3	Describe CAS architecture and types of archives and forms of virtualization
C412.4	Illustrate the storage infrastructure and management activities

Course Name: C413 (Internship)

C413.1	Identify, write down, and carry out performance objectives (mutually agreed upon by the employer, the MCC experiential learning supervisor, and the student) related to their job assignment.
C413.2	Acquire employment contacts leading directly to a full-time job following graduation from college.
C413.3	Identify how the internship relates to their academic courses and preferred career path
C413.4	Communicate in a workplace environment in a clear and confident manner
C413.5	Evaluate performance and accept feedback, in order to make changes as necessary
C413.6	Analyze a professional setting's strength and challenges

Course Name: C413 (Project Work Phase II-18CSP83)

C414.1	Analyze the problem, formulation, and solution of the selected project.
C414.2	Develop solutions for contemporary problems using modern tools for sustainable development.
C414.3	Apply ethical and professional sustainability while working in a team and communicate effectively for the benefit of society.
C414.4	Understand the engineering, finance, and management principles.

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Course Name: C415 (Seminar-18CSI85)

C415.1	Survey the changes in the technologies relevant to the topic selected
C415.2	Discuss the technology and interpret the impact on the society, environment and domain.
C415.3	Compile report of the study and present to the audience, following the ethics.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION

Course Name:C101(BMATE101- Mathematics-I for EEE Streams)

C101.1	Apply the knowledge of calculus to solve problems related to polar curves and learn the notion of partial differentiation to compute rate of change of multivariate functions
C101.2	Analyze the solution of linear and nonlinear ordinary differential equations.
C101.3	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume
C101.4	Make use of matrix theory for solving the system of linear equations and compute eigenvalues and eigenvectors
C101.5	Familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/ PYTHON/ SCILAB.

Course Name:C102(BCHEE102- Chemistry for EES)

C102.1	Identify the terms and processes involved in scientific and engineering applications
C102.2	Explain the methods of phenomena of chemistry to describe the engineering processes
C102.3	Solve for the problems in chemistry that are pertinent in engineering applications
C102.4	Apply the basic concepts of chemistry to explain the chemical properties and processes
C102.5	Analyse properties and processes associated with chemical substances in multidisciplinary situations

Course Name:C103(BCEDK103- Computer Aided Engineering Drawing)

C103.1	Draw and communicate the objects with definite shape and dimensions
C103.2	Recognize and Draw the shape and size of objects through different views
C103.3	Develop the lateral surfaces of the object
C103.4	Create a Drawing views using CAD software.
C103.5	***I***dentify the interdisciplinary engineering components or systems through its graphical representation.

Course Name:C104(BESCK104B- Introduction to Electrical Engineering)

C104.1	Understand the concepts of various energy sources and Electric circuits.
C104.2	Apply the basic Electrical laws to solve circuits.
C104.3	Discuss the construction and operation of various Electrical Machines.
C104.4	Identify suitable Electrical machine for practical implementation.
C104.5	Explain the concepts of electric power transmission and distribution, electricity billing, circuit protective devices and personal safety measures.

Course Name:C105(BPLCK105A- Introduction to Web Programming)

C105.2	Explain the historical context and justification for HTML over XHTML

C105.2	Develop HTML5 documents and adding various semantic markup tags
C105.2	Analyse various attributes, values and types of CSS
C105.2	Implement core constructs and event handling mechanisms of JavaScript.

Course Name:C105(BPLCK105B- Introduction to Python Programming)

C105.1	Demonstrate proficiency in handling loops and creation of functions
C105.2	Identify the methods to create and manipulate lists, tuples and dictionaries
C105.3	Develop programs for string processing and file organization
C105.4	Interpret the concepts of Object-Oriented Programming as used in Python

Course Name:C106(BENGK106- Communicative English)

C106.1	UNDERSTANDANDAPPLYTHEFUNDAMENTALSOFCOMMUNICATIONSKILLSINTHEIRCOMMUNICATIONSKILLS.
C106.2	IDENTIFYTHENUANCES OFPHONETICS,INTONATION ANDENHANCEPRONUNCIATION SKILLS.
C106.3	TOIMPARTBASICENGLISHGRAMMARANDESSENTIALS OFLANGUAGESKILLSASPERPRESENTREQUIREMENT.
C106.4	UNDERSTANDANDUSEALLTYPES OFENGLISHVOCABULARY ANDLANGUAGEPROFICIENCY
C106.5	ADOPTTHETECHNIQUESOF INFORMATIONTRANSFERTHROUGHPRESENTATION.

Course Name:C107(SAMSKRUTHIKA KANNADABKSKK107)

C107.1	ಕನ೬ಡ್ಞ□, □□ತ□ ಮಣ್ಱು ಕನ೬ಡದ □ಸಜ್ಯಂ೧ಂಯ ್ಞಣ್ಱ ಅ್ಞ೦ೊಲಞತು ಂ.
C107.2	ಕನ೬ಡ □□ತ□ದ ಪ□ ೭ನ್ನ್ವಗ฿ದ ಆಜaaಖಕ ಶಾವ೪ ಮಣ್ಱು ಆಜaaಖಕ ೭ವ□ಗಳಜ೬ □ಂ೦೨ಂ೧ಂಕ฿ಜ ಕಚಣ್ಱ ಗ□□ನ ಓಹಡ ಮಣ್ಱು ಠ್ಠನಃಜೆ □ೞ ೦೧ಂ೪ೊಝತು ಂ.
C107.3	ೲ೪□ ವ್ಱ೪ಗಳಚ□ □□ತ□ ಮಣ್ಱು □ಸಜ್ಯಂ೧ಂಯ ಬಡ□ ಅ್ಞ೦ □ಟಲಆಸ೬ುಯಜ೬ ಗ್ಯ□ ಞತು ಂ.
C107.4	ಡ್ಱಂ೧ಂ□ಕ ವ□ ೬ುಗಳ ಪ್ಞಚಯ □ಟಲಅವ್ಞಗಳ □೭೨□ದ ಲಷಯಗಳಜ೬ ೦೧ಂಓಆಂಝ ಜಲನ ಇಖ೬ತರ ವ□ ೬ುಗಳ ಬಡ□ ೦೧ಂಓಆಳ□ ಣ ಈಣ್ಱಕ□ ಗ್ಯ□ ಞತು ಂ.
C107.5	□ಂಸಜ್ಯಂ೧ಂಕ, ಜನಪದ□ಟಪ□ ฿ಸ ಕಥನಗಳ ಪ್ಞಚಯ□ಲಆಝ೦ಓ.

Course Name:C107(BALAKE KANNADA-BKBKK107)

C107.1	To understand the necessity of learning of local language for comfortable life.
C107.2	To speak, read and write Kannada language as per requirement.
C107.3	To communicate (converse) in Kannada language in their daily life with kannada speakers.

C107.4	To Listen and understand the Kannada language properly.
C107.5	To speak in polite conservation.

Course Name:C108(Scientific Foundations of Health-BSFHK158)

C108.1	To understand and analyse about Health and wellness (and its Beliefs) & It's balance for positive mindset
C108.2	Develop the healthy lifestyles for good health for their better future.
C108.3	Build a Healthy and caring relationships to meet the requirements of good/social/positive life.
C108.4	To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future
C108.5	Prevent and fight against harmful diseases for good health through positive mindset.

Course Name:C111(MATHEMATICS-II FOR ECE STREAM - BMATE201)

C111.1	Understand the applications of vector calculus refer to solenoidal, irrotational vectors, lineintegral and surface integral..
C111.2	Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation
C111.3	To understand the concept of Laplace transform and to solve initial value problems
C111.4	Apply the knowledge of numerical methods in solving physical and engineering phenomena.
C111.5	Get familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB /PYTHON/ SCILAB

Course Name:C112(BPHYE202- Applied Physics for EEE Stream)

C112.1	**Describe** the fundamental principles of the Quantum Mechanics and the essentials of Photonics.
C112.2	**Elucidate** the concepts of conductors, dielectrics and superconductivity.
C112.3	**Summarize** the properties of semiconductors and the working principles of semiconductor devices.
C112.4	**Discuss** the fundamentals of vector calculus and their applications in Maxwell's Equations and EM Waves.
C112.5	**Practice** working in groups to conduct experiments in physics and **Perform** precise and honest measurements.

Course Name:C113(BBEE203- Basic Electronics)

C113.1	Develop the basic knowledge on construction, operation and characteristics of semiconductor devices.
C113.2	Apply the acquired knowledge to construct small scale circuits consisting of semiconductor devices
C113.3	Develop competence knowledge to construct basic digital circuit by make use of basic gate and its function.
C113.4	Construct the conceptual blocks for basic communication system.
C113.5	Apply the knowledge of various transducers principle in sensor system.

Course Name:C114(BESCK204E- Introduction to C Programming)

C114.1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts
C114.2	Apply programming constructs of C language to solve the real world problem
C114.3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
C114.4	Explore user-defined data structures like structures, unions and pointers in implementing solutions
C114.5	Design and Develop Solutions to problems using modular programming constructs using functions

Course Name:C115(BETCK205H- Introduction to Internet of Things (IOT)

C115.1	Describe the evolution of IoT, IoT networking components, and addressing strategies in IoT
C115.2	Classify various sensing devices and actuator types.
C115.3	Demonstrate the processing in IoT.
C115.4	Explain Associated IOT Technologoes
C115.5	Illustrate architecture of IOT Applications

Course Name:C116(BPWSK206- Professional Writing Skills in English)

C116.1	TO UNDERSTAND AND IDENTIFY THE COMMON ERRORS IN WRITING AND SPEAKING.
C116.2	TO ACHIEVE BETTER TECHNICAL WRITING AND PRESENTATION SKILLS.
C116.3	TO READ TECHNICAL PROPOSALS PROPERLY AND MAKE THEM TO WRITE GOOD TECHNICAL REPORTS.
C116.4	ACQUIRE EMPLOYMENT AND WORKPLACE COMMUNICATION SKILLS.
C116.5	TO LEARN ABOUT TECHNIQUES OF INFORMATION TRANSFER THROUGH PRESENTATION IN DIFFERENT LEVEL.

Course Name:C117(BICOK207- Indian Constitution)

C117.1	Analyse the basic structure of Indian Constitution.
C117.2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution
C117.3	know about our Union Government, political structure & codes, procedures.
C117.4	Understand our State Executive & Elections system of India.
C117.5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.

Course Name:C118(BIDTK258- INNOVATION and DESIGN THINKING)

C118.1	Appreciate various design process procedure
C118.2	Generate and develop design ideas through different technique

C118.3	Identify the significance of reverse Engineering to Understand products
C118.4	Draw technical drawing for design ideas

Course Name:C201(21MAT31- Transform Calculus, Fourier Series and Numerical Techniques)

C201.1	To solve ordinary differential equations using Laplace transform.
C201.2	Demonstrate the Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
C201.3	To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations
C201.4	To solve mathematical models represented by initial or boundary value problems involving partial differential equations
C201.5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

Course Name:C202(21EC32-DSDV)

C202.1	Simplify Boolean functions using K-map and Quine-McCluskey minimization technique.
C202.2	Analyze and design for combinational logic circuits.
C202.3	Analyze the concepts of Flip Flops (SR, D, T and JK) and to design the synchronous sequential circuits using Flip Flops
C202.4	Model Combinational circuits (adders, subtractors, multiplexers) and sequential circuits using Verilog COURSE OUTCOMESs.

Course Name:C203(BSP-21EC33)

C203.1	Understand the basics of Linear Algebra.
C203.2	Analyse different types of signals and systems
C203.3	Analyse the properties of discrete time signals & system
C203.4	Analyse discrete time signals & systems using Z transforms

Course Name:C204(AEC -21EC34)

C204.1	Understand the characteristics of BJTs and FETs for switching and amplifier
C204.2	Design and analyze FET amplifiers and oscillators with different circuit configurations and biasing conditions.
C204.3	Understand the feedback topologies and approximations in the design of amplifiers and oscillators.

C204.4	Design of circuits using linear ICs for wide range applications such as ADC, DAC, filters and timers.
C204.5	Understand the power electronic device components and its functions for basic power electronic circuits

Course Name:C205(ADE LAB -21ECL35)

C205.1	Design and analyze the BJT/FET amplifier and oscillator circuits
C205.2	Design and test Opamp circuits to realise the mathematical computations, DAC and precision rectifiers
C205.3	Design and test the combinational logic circuits for the given specifications
C205.4	Test the sequential logic circuits for the given functionality
C205.5	Demonstrate the basic electronic circuit experiments using SCR and 555 timer

Course Name:C206(SOCIAL CONNECT & RESPONSIBILITIES-21EC36)

C206.1	Understand social responsibility
C206.2	Practice sustainability and creativity
C206.3	Showcase planning and organizational skills

Course Name:C207(SAMSKRUTIKA KANNADA-21KSK37)

C207.1	Kannada language, literature and Kannada culture will be introduced.
C207.2	Interest in pre- modern and modern poetry and culture of Kannada literature arises.
C207.3	Introduction of technical persons.
C207.4	Kannada grammar, general Kannada and administrative Kannada words will be introduced.

Course Name:C207(BALAKE KANNADA-21KBK37)

C207.1	To understand the necessity of learning of local language for comfortable life.
C207.2	To Listen and understand the Kannada language properly.

C207.3	To speak, read and write Kannada language as per requirement.
C207.4	To communicate (converse) in Kannada language in their daily life with kannada speakers.
C207.5	To speak in polite conservation.

Course Name:C208(LD (Logic Design) Lab using Pspice-21EC381)

C208.1	Demonstrate the truth table of various expressions and combinational circuits using logic gates
C208.2	Design various combinational circuits such as adders, subtractors, comparators, multiplexers and code converters
C208.3	Construct flips-flops, counters and shift registers.
C208.4	Design and implement synchronous counters.

Course Name:C211(Maths for Communication Engineers-21EC41)

C211.1	Recall the basic laws and definitions (with mathematical representations) in Electric and Magnetic fields.
C211.2	Apply the basic laws of Electric and Magnetic fields to arrive at Divergence Theorem, Current continuity Equation, Curl, Stokes' theorem.
C211.3	Apply Electric and Magnetic field concepts to arrive at Maxwell's equations, Electromagnetic wave equations and Poynting's theorem (Important concepts related to Communication link).
C211.4	Recall the definitions related to Random variables and Random Processes.
C211.5	Model the Random events in the Communication set-up and determine useful statistical parameters.

Course Name:C212(Digital Signal Processing-21EC42)

C212.1	Determine response of LTI systems using time domain and DFT techniques
C212.2	Compute DFT of real and complex discrete time signals
C212.3	Compute DFT using FFT algorithms

C212.4	Design FIR and IIR Digital Filters
C212.5	Design of Digital Filters using DSP processor

Course Name:C213(Circuits & Controls-21EC43)

C213.1	Analyse and solve Electric circuit, by applying, loop analysis, Nodal analysis and by applying network Theorems.
C213.2	Evaluate two port parameters of a network and Apply Laplace transforms to solve electric networks.
C213.3	Deduce transfer function of a given physical system, from differential equation representation or Block Diagram representation and SFG representation.
C213.4	Calculate time response specifications and analyse the stability of the system.
C213.5	Draw and analyse the effect of gain on system behaviour using root loci.
C213.6	Perform frequency response Analysis and find the stability of the system.
C213.7	Represent State model of the system and find the time response of the system

Course Name:C214(Communication Theory-21EC44)

C214.1	Understand the amplitude and frequency modulation techniques and perform time and frequency domain transformations.
C214.2	Identify the schemes for amplitude and frequency modulation and demodulation of analog signals and compare the performance.
C214.3	Characterize the influence of channel noise on analog modulated signals.
C214.4	Understand the characteristics of pulse amplitude modulation, pulse position modulation and pulse code modulation systems
C214.5	Illustration of digital formatting representations used for Multiplexers, Vocoders and Video transmission.

Course Name:C215(BIOLOGY FOR ENGINEERS -21EC45)

C215.1	Elucidate the basic biological concepts via relevant industrial applications and case studies

C215.2	Evaluate the principles of design and development, for exploring novel bioengineering projects.
C215.3	Corroborate the concepts of biomimetics for specific requirements.
C215.4	Think critically towards exploring innovative biobased solutions for socially relevant problems.

Course Name:C216(Communication Laboratory I-21ECL46)

C216.1	Demonstrate the AM and FM modulation and demodulation by representing the signals in time and frequency domain.
C216.2	Design and test the sampling, Multiplexing and PAM with relevant circuits.
C216.3	Demonstrate the basic circuitry and operations used in AM and FM receivers.
C216.4	Illustrate the operation of PCM and delta modulations for different input conditions.

Course Name:C217(Constitution of India and Professional Ethics-21CIP47)

C217.1	Analyse the basic structure of Indian Constitution.
C217.2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.
C217.3	know about our Union Government, political structure & codes, procedures.
C217.4	Understand our State Executive & Elections system of India.
C217.5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.

Course Name:C218(Embedded C Basics-21EC481)

C218.1	Write C programs in 8051 for solving simple problems that manipulate input data using different instructions of 8051 C
C218.2	Develop testing and experimental procedures on 8051 Microcontroller, analyze their operation under different cases.
C218.3	Develop programs for 8051 Microcontroller to implement real world problems.
C218.4	Design and Develop Mini projects.

C218.5	Model the Random events in the Communication set-up and determine useful statistical parameters.

Course Name:C219(UNIVERSAL HUMAN VALUES-I-21UH49)

C219.1	Holistic vision of life
C219.2	Socially responsible behaviour
C219.3	Environmentally responsible work
C219.4	Ethical human conduct
C219.5	Having Competence and Capabilities for Maintaining Health and Hygiene
C219.6	Appreciation and aspiration for excellence (merit) and gratitude for all

Course Name:C301 (Management & Entrepreneurship-18ES51)

C301.1	Understand the fundamental concepts of Management and Entrepreneurship
C301.2	Select a best Entrepreneurship model for the required domain of establishment
C301.3	Describe the functions of Managers, Entrepreneurs and their social responsibilities
C301.4	Compare various types of Entrepreneurs
C301.5	Analyze the Institutional support by various state and central government agencies
C301.6	The small-scale industries and prepare the project report.

Course: C302(Digital Signal Processing -18EC52)

C302.1	Determine response of LTI systems using time domain and DFT techniques.
C302.2	Compute DFT of real and complex discrete time signals.
C302.3	Computation of DFT using FFT algorithms and linear filtering approach.
C302.4	Solve problems on digital filter design and realize using digital computations.
C302.5	Differentiate different Digital filter structures.
C302.6	Design the Digital filters for the given specifications.

Course: C303(Principles of communication -18EC53)

C303.1	Analyze and compute performance of AM and FM modulation in the presence of noise at the receiver.
C303.2	Analyze and compute performance of digital formatting processes with quantization noise.
C303.3	Multiplex digitally formatted signals at Transmitter and demultiplex the signals and reconstruct digitally formatted signals at the receiver.
C303.4	Design/Demonstrate the use of digital formatting in Multiplexers, Vocoders and Video

	transmission.
C303.5	Design/Demonstrate the use of digital formatting in Multiplexers, Vocoders and Video transmission.
C303.6	Evolve the concept of quantization noise for sampled and encoded signals and study the concepts of reconstruction from these samples at a receiver.

Course Name:C304(Information Theory & Coding -18EC54)

C304.1	Explain concept of Dependent & Independent Source, measure of information, Entropy, Rate of Information and Order of a source
C304.2	Represent the information using Shannon Encoding, Shannon Fano, Prefix and Huffman Encoding Algorithms
C304.3	Model the continuous and discrete communication channels using input, output and joint probabilities
C304.4	Determine a codeword comprising of the check bits computed using Linear Block codes, cyclic codes & convolution codes
C304.5	Design the encoding and decoding circuits for Linear Block codes, cyclic codes, convolutional codes, BCH and Golay codes.
C304.6	Compare the performance of digital communication system by evaluating the probability of error for different error correcting codes

Course Name:C305 (Electromagnetic waves-18EC55)

C305.1	Evaluate problems on electric field due to point, linear, volume charges by applying conventional methods or by Gauss law.
C305.2	Determine potential and energy with respect to point charge and capacitance using Laplace equation.
C305.3	Calculate magnetic field, force, and potential energy with respect to magnetic materials.
C305.4	Apply Maxwell 's equation for time varying fields, EM waves in free space and conductors.
C305.5	Evaluate power associated with EM waves using Poynting theorem.
C305.6	Develop the knowledge of Poynting theorem and its application of power flow.

Course Name:C306(Verilog HDL-18EC56)

C306.1	Write Verilog programs in gate, dataflow (RTL), behavioral and switch modeling levels Of Abstraction.
C306.2	Design and verify the functionality of digital circuit/system using test benches.
C306.3	Identify the suitable Abstraction level for a particular digital design.
C306.4	Write the programs more effectively using Verilog tasks and directives.
C306.5	Perform timing and delay Simulation.

Course Name:C307 (DSP Lab-18ECL57)

C307.1	Understand the concepts of analog to digital conversion of signals and frequency domain sampling of signals.

C307.2	Modeling of discrete time signals and systems and verification of its properties and results.
C307.3	Implementation of discrete computations using DSP processor and verify the results.
C307.4	Realize the digital filters using a simulation tool and a DSP processor and verify the frequency and phase response
C307.5	Determine response of LTI systems using time domain and DFT techniques.
C307.6	Compute DFT of real and complex discrete time signals.

Course Name: C308 (HDL Lab-18ECL58)

C308.1	Write the Verilog/VHDL programs to simulate Combinational circuits in Dataflow, Behavioral and Gate level Abstractions.
C308.2	Describe sequential circuits like flip flops and counters in Behavioral COURSE OUTCOMES and obtain simulation waveforms
C308.3	Synthesize Combinational and Sequential circuits on programmable ICs and test the hardware.
C308.4	Write the VHDL programs to simulate Combinational circuits in Dataflow, Behavioral and Gate level Abstractions.
C308.5	Write the Verilog/VHDL programs to simulate sequential circuits in Dataflow, Behavioral and Gate level Abstractions.
C308.6	Interface the hardware to the programmable chips and obtain the required output.

Course Name:C311 (Digital Communication-18EC61)

C311.1	Associate and apply the concepts of Bandpass sampling to well specified signals and channels.
C311.2	Analyze and compute performance parameters and transfer rates for low pass and bandpass symbol under ideal and corrupted non-band limited channels.
C311.3	Analyzing of different electrical means of signal
C311.4	Test and validate symbol processing and performance parameters at the receiver under ideal and corrupted bandlimited channels.
C311.5	Demonstrate by simulation and emulation that bandpass signals subjected to corrupted
C311.6	Distorted symbols in a bandlimited channel, can be demodulated and estimated at receiver to meet specified performance criteria

Course Name: C312 (Embedded Systems-18EC62)

C312.1	Describe the architectural features and instructions of 32-bit microcontroller ARM Cortex M3.
C312.2	Understand the instruction set of ARM Cortex M3 and perform assembly level programming.
C312.3	Apply the knowledge gained for Programming ARM Cortex M3 for different applications.
C312.4	Understand the basic hardware components and their selection method based onthe characteristics and attributes of an embedded system.
C312.5	Develop the hardware /software co-design and firmware design approaches

C312.6	Explain the need of real time operating system for embedded system applications.

Course Name: C313 (Microwave and Antennas-18EC63)

C313.1	Describe the use and advantages of microwave transmission
C313.2	Analyze various parameters related to microwave transmission lines and waveguides
C313.3	Identify microwave devices for several applications
C313.4	Analyze various antenna parameters necessary for building a RF system
C313.5	Recommend various antenna configurations according to the applications.
C313.6	Select antennas for specific applications

Course Name: C314 (Python Applications and Programming-18EC646)

C314.1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
C314.2	Demonstrate proficiency in handling Strings and File Systems.
C314.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
C314.4	Interpret the concepts of Object-Oriented Programming as used in Python.
C314.5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python.
C314.6	Build Web Services, Network and Database Programs in Python.

Course Name: C315 (Operating systems-18CS654)

C315.1	Explain the goals, structure, operation and types of operating systems.
C315.2	Apply scheduling techniques to find performance factors.
C315.3	Explain organization of file systems and IOCS.
C315.4	Apply suitable techniques for contiguous and non-contiguous memory allocation.
C315.5	Describe message passing, deadlock detection and prevention methods.
C315.6	Understand interprocess communication and deadlock situations.

Course Name:C316(Embedded Lab-18ECL66)

C316.1	Understand the instruction set of 32 bit microcontroller ARM Cortex M3, and the software tool required for programming in Assembly and C language.
C316.2	Develop assembly language programs using ARM Cortex M3 for different applications.
C316.3	Interface external devices and I/O with ARM Cortex M3.
C316.4	Develop C language programs for embedded system applications
C316.5	Develop C library functions for embedded system applications
C316.6	Interface to LPC1768 for various applications.

Course Name:C317(CCN Lab-18ECL67)

C317.1	Use the network simulator for learning and practice of networking algorithms.
C317.2	Illustrate the operations of network protocols and algorithms using C programming.
C317.3	Simulate the network with different configurations to measure the performance parameters.
C317.4	Implement the data link and routing protocols using C programming.

C317.5	Construct a network model and determine the routing of packets using different Routing algorithms.
C317.6	Analyze different concepts like DNS (Domain Name Systems) and TCP, UDP.

Course: Computer Networks (C401)-18EC71

CO-1	Understand the layering architecture of OSI reference model and TCP/IP protocol suite
CO-2	Understand the concepts of networking thoroughly
CO-3	Identify the protocols and services of different layers.
CO-4	Distinguish the basic network configurations and standards associated with each network
CO-5	Analyze a simple network and measurement of its parameters.

Course: VLSI Design (C402)-18EC72

CO-1	Demonstrate understanding of MOS transistor theory, CMOS fabrication flow and technology scaling.
CO-2	Draw the basic gates using the stick and layout diagrams with the knowledge of physical design aspects.
CO-3	Demonstrate ability to design Combinational, sequential and dynamic logic circuits as per the requirements
CO-4	Interpret Memory elements along with timing considerations

Course: Satellite Communication (C403)-18EC73

CO-1	Describe the satellite orbits and its trajectories with the definitions of parameters associated with it.
CO-2	Describe the electronic hardware systems associated with the satellite subsystem and earth station.
CO-3	Describe the various applications of satellite with the focus on national satellite system.
CO-4	Compute the satellite link parameters under various propagation conditions with the illustration of multiple access techniques.

Course: Machine Learning with Python (C404)-18EC745

CO-1	Identify the problems in machine learning.
CO-2	Select supervised, unsupervised or reinforcement learning for problem-solving.
CO-3	Apply theory of probability and statistics in machine learning
CO-4	Apply concept learning, ANN, Bayes classifier, k nearest neighbor

Course: BMSP(C405)-18MT751

CO-1	To gain Knowledge of Biomedical Signals, ECG, Signal Conversion & Averaging, Adaptive Noise Cancellation, Data Compression Techniques, Cardiological signal processing, Neurological signal processing.
CO-2	To understand the operation of Biomedical Signal Processing ,ECG Signal Conversion & Averaging ,Adaptive Noise Cancellation, Data Compression Techniques, Cardiological signal & Neurological signal processing
CO-3	Have Knowledge of Biomedical Signals, ECG, Signal Conversion & Averaging,

	Adaptive Noise Cancellation, Data Compression Techniques, Cardiological signal processing, Neurological signal processing.
CO-4	Understand the operation of Biomedical Signal Processing ,ECG Signal Conversion & Averaging ,Adaptive Noise Cancellation, Data Compression Techniques, Cardio logical signal & Neurological signal processing

Course Name:C406 (Advanced Communication Lab)

CO-1	Determine the characteristics and response of microwave devices and optical waveguide.
CO-2	Determine the characteristics of micro strip antennas and devices and compute the parameters associated with it.
CO-3	Simulate the digital modulation schemes with the display of waveforms and computation of performance parameters.
CO-4	Design and test the digital modulation circuits/systems and display the waveforms.
CO-5	Design and demonstrate the digital modulation techniques.
CO-6	Demonstrate and measure the wave propagation in micro strip antennas.

Course Name:C407 (VLSI Lab)

CO-1	Write test bench to simulate various digital circuits.
CO-2	Interpret concepts of DC Analysis, AC Analysis and Transient Analysis in analog circuits.
CO-3	Design and simulate basic CMOS circuits like inverter, common source amplifier and differential amplifiers.
CO-4	Use basic amplifiers and further design higher level circuits like operational amplifier and analog/digital converters to meet desired parameters.
CO-5	Use transistors to design gates and further using gates realize shift registers and adders to meet desired parameters.
CO-6	Learn DRC, LVS and Parasitic Extraction of the various designs.

Course Name:C408 (Project Work)

CO-1	Demonstrate a sound technical knowledge of their selected project topic.
CO-2	Undertake problem identification, formulation and solution.
CO-3	Design engineering solutions to complex problems utilizing a systems approach.
CO-4	Conduct an engineering project.
CO-5	Communicate with engineers and the community at large in written an oral forms.
CO-6	Demonstrate the knowledge, skills and attitudes of a professional engineer.

Course: Wireless and cellular Communication (C411)-18EC81

CO-1	Explain concepts of propagation mechanisms like Reflection, Diffraction, Scattering in wireless channels.
CO-2	Develop a scheme for idle mode, call set up, call progress handling and call tear down in a GSM cellular network.
CO-3	Develop a scheme for idle mode, call set up, call progress handling and call tear down in a CDMA cellular network.
CO-4	Understand the Basic operations of Air interface in a LTE 4G system.

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Course: Network Security (C412)-18EC821

CO-1	Explain network security services and mechanisms and explain security concepts
CO-2	Understand the concept of Transport Level Security and Secure Socket Layer.
CO-3	Explain Security concerns in Internet Protocol security
CO-4	Explain Intruders, Intrusion detection and Malicious Software
CO-5	Describe Firewalls, Firewall Characteristics, Biasing and Configuration

Course: Radar Engineering (C413)-18EC823

CO-1	Understand the radar fundamentals and radar signals.
CO-2	Explain the working principle of pulse Doppler radars, their applications and limitations.
CO-3	Describe the working of various radar transmitters and receivers.
CO-4	Analyze the range parameters of pulse radar system which affect the system performance.

Course Name:C414 (Internship)

CO-1	Identify, write down, and carry out performance objectives (mutually agreed upon by the employer, the MCC experiential learning supervisor, and the student) related to their job assignment.
CO-2	Acquire employment contacts leading directly to a full-time job following graduation from college.
CO-3	Identify how the internship relates to their academic courses and preferred career path
CO-4	Communicate in a workplace environment in a clear and confident manner
CO-5	Evaluate performance and accept feedback, in order to make changes as necessary
CO-6	Analyze a professional setting's strength and challenges

Course Name:C415(Project Work)

CO-1	Demonstrate a sound technical knowledge of their selected project topic.
CO-2	Undertake problem identification, formulation and solution.
CO-3	Design engineering solutions to complex problems utilizing a systems approach.
CO-4	Conduct an engineering project.
CO-5	Communicate with engineers and the community at large in written an oral forms.
CO-6	Demonstrate the knowledge, skills and attitudes of a professional engineer.

Course Name:C416(Seminar)

CO-1	Demonstrate a sound technical knowledge of their selected seminar topic.
CO-2	Establish motivation for any topic of interest and develop a thought process for technical presentation.
CO-3	Organize a detailed literature survey and build a document with respect to technical publications.
CO-4	Analysis and comprehension of proof-of-concept and related data.
CO-5	Effective presentation and improve soft skills.
CO-6	Make use of new and recent technology (e.g. Latex) for creating technical reports

CHILDREN'S EDUCATION SOCIETY (Regd.)
THE OXFORD COLLEGE OF ENGINEERING
(Recognised by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi.
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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

Course Name:C101(BMATE101-Mathematics-I for EEE Streams)

C101.1	Apply the knowledge of calculus to solve problems related to polar curves and learn the notion of partial differentiation to compute rate of change of multivariate functions
C101.2	Analyze the solution of linear and nonlinear ordinary differential equations.
C101.3	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume
C101.4	Make use of matrix theory for solving the system of linear equations and compute eigenvalues and eigenvectors
C101.5	Familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/ PYTHON/ SCILAB.

Course Name:C102(BCHEE102-Chemistry for EES)

C102.1	Identify the terms and processes involved in scientific and engineering applications
C102.2	Explain the methods of phenomena of chemistry to describe the engineering processes
C102.3	Solve for the problems in chemistry that are pertinent in engineering applications
C102.4	Apply the basic concepts of chemistry to explain the chemical properties and processes
C102.5	Analyse properties and processes associated with chemical substances in multidisciplinary situations

Course Name:C103(BCEDK103- Computer Aided Engineering Drawing)

C103.1	Draw and communicate the objects with definite shape and dimensions
C103.2	Recognize and Draw the shape and size of objects through different views
C103.3	Develop the lateral surfaces of the object
C103.4	Create a Drawing views using CAD software.
C103.5	***I***dentify the interdisciplinary engineering components or systems through its graphical representation.

Course Name:C104(BESCK104B- Introduction to Electrical Engineering)

C104.1	Understand the concepts of various energy sources and Electric circuits.
C104.2	Apply the basic Electrical laws to solve circuits.
C104.3	Discuss the construction and operation of various Electrical Machines.
C104.4	Identify suitable Electrical machine for practical implementation.
C104.5	Explain the concepts of electric power transmission and distribution, electricity billing, circuit protective devices and personal safety measures.

Course Name:C105(BPLCK105A- Introduction to Web Programming)

C105.2	Explain the historical context and justification for HTML over XHTML
C105.2	Develop HTML5 documents and adding various semantic markup tags
C105.2	Analyse various attributes, values and types of CSS
C105.2	Implement core constructs and event handling mechanisms of JavaScript.

Course Name:C105(BPLCK105B- Introduction to Python Programming)

C105.1	Demonstrate proficiency in handling loops and creation of functions
C105.2	Identify the methods to create and manipulate lists, tuples and dictionaries
C105.3	Develop programs for string processing and file organization
C105.4	Interpret the concepts of Object-Oriented Programming as used in Python

Course Name:C106(BENGK106-Communicative English)

C106.1	UNDERSTANDANDAPPLYTHEFUNDAMENTALSOFCOMMUNICATIONSKILLSINTHEIRCOMMUNICATIONSKILLS.
C106.2	IDENTIFYTHENUANCES OFPHONETICS,INTONATION ANDENHANCEPRONUNCIATION SKILLS.
C106.3	TOIMPARTBASICENGLISHGRAMMARANDESSENTIALS OFLANGUAGESKILLSASPERPRESENTREQUIREMENT.
C106.4	UNDERSTANDANDUSEALLTYPES OFENGLISHVOCABULARY ANDLANGUAGEPROFICIENCY
C106.5	ADOPTTHETECHNIQUESOF INFORMATIONTRANSFERTHROUGHPRESENTATION.

Course Name:C107(SAMSKRUTHIKA KANNADABKSKK107)

C107.1	ಕನ಼ಡ್ಢ□, □□ತ□ ಮಣ್ಣು಻ಕನ಼ಡದ □ಸಜ್ಕೃ಺ರ಺ಯ಺ಣ್ಣುಅಕ್ಠೊಲ಩ತ಻ೀ಺.
C107.2	ಕನ಼ಡ □□ತ□ದಪ□ ಏನ್ನಗ฿ದಆಜ಼ಖಕಣವ಼ಮಣ್ಣು಻ಆಜ಼ಖಕಽವ□ಗಳಜ಼ □ೀ಺಼಺ರ಺ಕ฿ಜಕಲಣ್ಣುಣ□□ನಓಥಡಮಣ್ಣು಻ಠನಃಜೆ □ಽ಺ರ಺಼ೊಶತ಻ೀ಺.
C107.3	ಠಿ□ ವ್ಲಿಗಳಲ□ □□ತ□ ಮಣ್ಣು಻ □ಸಜ್ಕೃ಺ರ಺ಯಬಡ□ ಅಕ್ □ಟಆಸಽ಻ಯಜ಼ಣಿ್ೃ□ ಞತ಻ೀ಺.
C107.4	ಠ಺಺ರ಺□ಕವ□ ಽ಻ಗಳಪಕಚಯ □ಟಅವ಩ಗಳ □ಏ□ದಷಯಗಳಜ಼಺ರ಺್ಷಆ಺ಶ಩ನಇಖತರವ□ ಽ಻ಗಳಬಡ□ ಺ರ಺್ಷಆಳ□ ಫಈಣ್ಣುಕ□ ಣ್ೃ□ ಞತ಻ೀ಺.
C107.5	□ೀ಺ಸಜ್ಕೃ಺ರ಺ಕ, ಜನಪದ□ಟಪ□ ฿ಸಕಥನಗಳಪಕಚಯ□಩ಆಶ್ಷ.

Course Name:C107(BALAKE KANNADA-BKBKK107)

C107.1	To understand the necessity of learning of local language for comfortable life.
C107.2	To speak, read and write Kannada language as per requirement.

C107.3	To communicate (converse) in Kannada language in their daily life with kannada speakers.
C107.4	To Listen and understand the Kannada language properly.
C107.5	To speak in polite conservation.

Course Name:C108(Scientific Foundations of Health-BSFHK158)

C108.1	To understand and analyse about Health and wellness (and its Beliefs) & It's balance for positive mindset
C108.2	Develop the healthy lifestyles for good health for their better future.
C108.3	Build a Healthy and caring relationships to meet the requirements of good/social/positive life.
C108.4	To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future
C108.5	Prevent and fight against harmful diseases for good health through positive mindset.

Course Name:C111(MATHEMATICS-II FOR ECE STREAM - BMATE201)

C111.1	Understand the applications of vector calculus refer to solenoidal, irrotational vectors, lineintegral and surface integral..
C111.2	Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation
C111.3	To understand the concept of Laplace transform and to solve initial value problems
C111.4	Apply the knowledge of numerical methods in solving physical and engineering phenomena.
C111.5	Get familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB /PYTHON/ SCILAB

Course Name:C112(BPHYE202-Applied Physics for EEE Stream)

C112.1	**Describe** the fundamental principles of the Quantum Mechanics and the essentials of Photonics.
C112.2	**Elucidate** the concepts of conductors, dielectrics and superconductivity.
C112.3	**Summarize** the properties of semiconductors and the working principles of semiconductor devices.
C112.4	**Discuss** the fundamentals of vector calculus and their applications in Maxwell's Equations and EM Waves.
C112.5	**Practice** working in groups to conduct experiments in physics and **Perform** precise and honest measurements.

Course Name:C113(BBEE203-Basic Electronics)

C113.1	Develop the basic knowledge on construction, operation and characteristics of semiconductor devices.
C113.2	Apply the acquired knowledge to construct small scale circuits consisting of semiconductor devices
C113.3	Develop competence knowledge to construct basic digital circuit by make use of basic gate and its function.

C113.4	Construct the conceptual blocks for basic communication system.
C113.5	Apply the knowledge of various transducers principle in sensor system.

Course Name:C114(BESCK204E-Introduction to C Programming)

C114.1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts
C114.2	Apply programming constructs of C language to solve the real world problem
C114.3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
C114.4	Explore user-defined data structures like structures, unions and pointers in implementing solutions
C114.5	Design and Develop Solutions to problems using modular programming constructs using functions

Course Name:C115(BETCK205H-Introduction to Internet of Things (IOT)

C115.1	Describe the evolution of IoT, IoT networking components, and addressing strategies in IoT
C115.2	Classify various sensing devices and actuator types.
C115.3	Demonstrate the processing in IoT.
C115.4	Explain Associated IOT Technologoes
C115.5	Illustrate architecture of IOT Applications

Course Name:C116(BPWSK206-Professional Writing Skills in English)

C116.1	TO UNDERSTAND AND IDENTIFY THE COMMON ERRORS IN WRITING AND SPEAKING.
C116.2	TO ACHIEVE BETTER TECHNICAL WRITING AND PRESENTATION SKILLS.
C116.3	TO READ TECHNICAL PROPOSALS PROPERLY AND MAKE THEM TO WRITE GOOD TECHNICAL REPORTS.
C116.4	ACQUIRE EMPLOYMENT AND WORKPLACE COMMUNICATION SKILLS.
C116.5	TO LEARN ABOUT TECHNIQUES OF INFORMATION TRANSFER THROUGH PRESENTATION IN DIFFERENT LEVEL.

Course Name:C117(BICOK207-Indian Constitution)

C117.1	Analyse the basic structure of Indian Constitution.
C117.2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution
C117.3	know about our Union Government, political structure & codes, procedures.
C117.4	Understand our State Executive & Elections system of India.
C117.5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.

Course Name:C118(BIDTK258-INNOVATION and DESIGN THINKING)

C118.1	Appreciate various design process procedure
C118.2	Generate and develop design ideas through different technique
C118.3	Identify the significance of reverse Engineering to Understand products
C118.4	Draw technical drawing for design ideas

Course Name: C201 (21MAT31 – Transform Calculus, Fourier series and Numerical Techniques)

C201.1	To solve ordinary differential equations using Laplace transform.
C201.2	Demonstrate the Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing and field theory.
C201.3	To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations
C201.4	To solve mathematical models represented by initial or boundary value problems involving partial differential equations
C201.5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis

Course Name: Course Name: C202 (21EE32 – Analog Electronic Circuits and Opamps)

C202.1	Obtain the Output characteristics of clipper and Clamper circuits
C202.2	Design and compare biasing circuits for transistor amplifier & explain the transistor switching
C202.3	Explain the concept of feedback its types and design of feedback
C202.4	Design and analyze the power amplifier circuits and oscillators for different frequencies
C202.5	Design and analysis of FET and MOSFET amplifiers
C202.6	Demonstrate the application of Opamps

Course Name: Course Name: C203 (21EE33 – Electric Circuit Analysis)

C203.1	Understand the basic concepts, basic laws and methods of analysis of DC and AC networks.
C203.2	Reduce the complexity of network using source shifting, source transformation and network reduction using transformations.
C203.3	Solve complex electric circuits using network theorems.
C203.4	Discuss resonance in series and parallel circuits and also the importance of initial conditions and their evaluation.
C203.5	Synthesize typical waveforms using Laplace transformation.
C203.6	Solve unbalanced three phase systems and also evaluate the performance of two port networks.

Course Name: Course Name: C204 (21EE34 – Transformers and Generators)

C204.1	Understand the construction and operation of 1-phase, 3-Phase transformers and Auto Transformer
C204.2	Analyze the performance of transformers by polarity test, Sumpner
C204.3	Understand the construction and working of AC and DC Generators.
C204.4	Analyze the performance of the AC Generators on infinite bus and parallel operation
C204.5	Determine the regulation of AC Generator by Slip test, EMF, MMF, and ZPF Methods
C204.6	Performance of synchronous generators, power angle characteristics

Course Name: Course Name: C205 (21EE35 – Electrical Machines Lab – I)

C205.1	Evaluate the performance of transformers from the test data obtained
C205.2	Connect and operate two single phase transformers of different KVA rating in parallel
C205.3	Connect single phase transformers for three phase operation and phase conversion
C205.4	Compute the voltage regulation of synchronous generator using the test data obtained in the laboratory
C205.5	Evaluate the performance of synchronous generators from the test data
C205.6	Assess the performance of synchronous generator connected to infinite bus

Course Name: Course Name: C206 (21UH36 – Social Connect and Responsibility)

C206.1	Understand social Responsibility
C206.2	Practice Sustainability and creativity
C206.3	Showcase Planning and organizational skills
C206.4	Communicate effectively and to present ideas clearly and coherently in both the written and oral forms
C206.5	Work in a team to achieve common goal

Course Name: Course Name: C207 (21CIP37 – Constitution of India and Professional Ethics)

C207.1	Have constitutional knowledge and legal literacy
C207.2	Understand Engineering and Professional Ethics and Responsibilities of Engineers

Course Name: Course Name: C208 (21EEL383 – 555 IC Lab)

C208.1	Analyze in an Intelligent Manner, Think better and perform better

Course Name: C212 (21EE42 – Digital System Design)

C212.1	Develop simplified switching equation using Karnaugh Maps and QuineMcClusky techniques.
C212.2	Design of Combinational circuits. Design Multiplexer, Encoder, Decoder, Adder, Subtractors and Comparator as digital combinational control circuits.
C212.3	Design flip flops, counters, shift registers as sequential control circuits.
C212.4	Develop Mealy/Moore Models and state diagrams for the given clocked sequential circuits.
C212.5	Explain the functioning of Read only and Read/Write Memories, Programmable ROM, EPROM and Flash memory.
C212.6	Realize Boolean expressions, adders and subtractors using gates. and Design and test Ring counter/Johnson counter, Sequence generator and 3 bit counters.

Course Name: C213 (21EE43 - Microcontroller)

C213.1	Outline the 8051 architecture, registers, internal memory organization, addressing modes
C213.2	Discuss 8051 addressing modes, instruction set of 8051, accessing data and I/O port programming.
C213.3	Develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic and arithmetic operations, data conversion and timer/counter programming.
C213.4	Summarize the basics of serial communication and interrupts, also develop 8051 programs for serial data communication and interrupt programming
C213.5	Program 8051to work with external devices for ADC, DAC, Stepper motor control, DC motor control.

Course Name: C214 (21EE44 – Electric Motors)

C214.1	Explain the construction, operation and classification of DC Motor and AC motor
C214.2	Describe the performance characteristics and applications of Electric motors.
C214.3	Demonstrate and explain the methods of testing of DC machines and determine losses and efficiency.
C214.4	Explain the methods of Controlling the speed of DC motor and induction motor.
C214.5	Explain the starting methods, equivalent circuit and phasor diagrams, torque angle, effect of change in excitation and change in load, hunting and damping of synchronous motors

Course Name: C215 (21BE45 – Biology for Engineers)

C215.1	Elucidate the basic biological concepts via relevant industrial applications and case studies
C215.2	Evaluate the principles of design and development, for exploring novel bioengineering projects
C215.3	Corroborate the concepts of biomimetics for specific requirements
C215.4	Think critically towards exploring innovative biobased solutions for socially relevant problems

Course Name: C216 (21EEL46 – Electrical Machines Lab – II)

C216.1	Test DC machines to determine their characteristics and also to control the speed of DC motor.
C216.2	Pre-determine the performance characteristics of DC machines by conducting suitable tests.
C216.3	Perform load test on single phase and three phase induction motor to assess its performance.
C216.4	Conduct test on induction motor to pre-determine the performance characteristics.
C216.5	Conduct test on synchronous motor to draw the performance curves

Course Name: C218 (21EEL484 – Simulation of Opamp Circuits)

C218.1	Analyse in a systematic way, think better, and perform better.

Course Name: C219 (21UHV48 – Universal Human Values)

C219.1	Understand and analyse the essentials of human values and skills, self exploration, happiness and prosperity.
C219.2	Evaluate coexistence of the ?I? with the body.
C219.3	Identify and evaluate the role of harmony in family, society and universal order.
C219.4	Understand and associate the holistic perception of harmony at all levels of existence.
C219.5	Develop appropriate technologies and management patterns to create harmony in professional and personal lives.

Course Name: C301 (18EE51 – MANAGEMENT & ENTREPRENEURSHIP)

C301.1	Explain the field of management, task of the manager, planning and the need of proper staff, recruitment and selection process.
C301.2	Discuss work allocation, the structure of organization, the modes of communication and importance of managerial control in business.
C301.3	To explain need of coordination between the manager and staff in exercising the authority and delegating duties.
C301.4	To explain the social responsibility of business and leadership&concepts of entrepreneurship and the role and importance.
C301.5	Show an understanding of the role and importance of Small Scale Industries, business plan and its presentation.
C301.6	Discuss the concepts of project management, capitol building process, project feasibility study, project appraisal and project financing.

Course Name: C302 (18EE52 – Microcontroller)

C302.1	To explain the internal or organization and working of computers, microcontrollers and embedded processors also to compare and contrast the various members of the 8051 family.
C302.2	To explain in detail the execution of 8051 assembly language instructions and data types and also to explain loop, conditional and unconditional jump and call, handling and manipulation of I / O instructions.
C302.3	To explain develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic, arithmetic operations and data conversions.
C302.4	To explain develop 8051C serial port programming.
C302.5	To explain in detail the interfacing of various devices with 8051 C processor.
C302.6	To explain about various interrupt routines

Course Name: C303 (18EE53 – POWER ELECTRONICS)

C303.1	- To explain application area of power electronics, types of power electronic circuits and switches their characteristics and specifications.
C303.2	To explain types of power diodes, their characteristics, and the effects of power diodes on RL circuits. .
C303.3	To explain the techniques for design, operation and analysis of single phase diode rectifier circuits
C303.4	To explain steady state, switching characteristics and gate control requirements of different power transistors and their limitations.
C303.5	To discuss different types of Thyristors, their operation, gate characteristics and gate control requirements
C303.6	To explain designing, analysis techniques and characteristics of thyristor controlled rectifiers.

Course Name: C304 (18EE54 – Signals and Systems)

C304.1	Basics of signals and system, Classification of signals and system
C304.2	To explain in detail the basic operations on signals and properties of system
C304.3	To explain the use convolution in both continuous and discrete domain for the analysis of systems given the impulse response of a system.Provide block diagram representation of LTI system.
C304.4	To explain use Z-transform and properties of Z-transform for the analysis of discrete time systems
C304.5	To explain in detail the continuous time Fourier transform representation to study signals and linear time invariant systems
C304.6	To explain to apply Discrete time Fourier transform representation to study signals and linear time invariant systems

Course Name: C305 (18EE55 – ELECTRICAL MACHINE DESIGN)

C305.1	Identify and list, limitations, modern trends in design, manufacturing of electrical machines and properties of materials used in the electrical machines
C305.2	Derive the output equation of DC machine, discuss selection of specific loadings and magnetic circuits of DC machines, design the field windings of DC machine, and design stator and rotor circuits of a DC machine.
C305.3	Derive the output equations of transformer, discuss selection of specific loadings, and estimate the number of cooling tubes, no load current and leakage reactance of core type transformer.
C305.4	Develop the output equation of induction motor, discuss selection of specific loadings and magnetic circuits of induction motor, design stator and rotor circuits of a induction motor.
C305.5	Formulate the output equation of alternator, design the field windings of Synchronous machine, discuss short circuit ratio and its effects on performance of synchronous machines, design salient pole and non-salient pole alternators for given
C305.6	To define short circuit ratio and discuss its effect on machine performance

Course Name: C306 (18EE56 – High Voltage Engineering)

C306.1	Explain conduction and breakdown phenomenon in gases, liquid dielectrics and breakdown phenomenon in solid dielectrics
C306.2	Summarize generation of high voltages and currents
C306.3	Outline measurement techniques for high voltages and currents
C306.4	Summarize overvoltage phenomenon and insulation coordination in electric power systems
C306.5	Explain non-destructive testing of materials and electric apparatus
C306.6	Explain high-voltage testing of electric apparatus

Course Name: C307 (18EEL57 – Microcontroller Laboratory)

C307.1	Write Assembly language Program for arithmetic and data transfer Instructions
C307.2	Write Assembly language Program for Logical and Branching Instructions
C307.3	Write Assembly/ C language Program for Counters
C307.4	Write Assembly / C language Program for generating Delays
C307.5	Interface External control and Display devices
C307.6	To work in a team and present report

Course Name: C308 (18EEL58 – Microcontroller Laboratory)

C308.1	To conduct experiments on semiconductor devices to obtain their static characteristics.
C308.2	To study different methods of triggering the SCR
C308.3	To study the performance of single phase controlled full wave rectifier and AC voltage controller with R and RL loads
C308.4	To control the speed of a dc motor, universal motor and stepper motors
C308.5	To study single phase full bridge inverter connected to resistive load.
C308.6	To study protection circuit

Course Name: C311 (18EE61 – CONTROL SYSTEMS)

C301.1	Discuss the effect of feedback and types of control systems, evaluate the transfer function.
C301.2	Evaluate the stability of linear time invariant systems.
C301.3	Apply block diagram manipulation and signal flow graph.
C301.4	Demonstrate the model of control system using mathematical modeling.
C301.5	Determine the transient and steady state time response.
C301.6	Investigate the performance of the given system in time and frequency domain based design of controller or compensator configuration.

Course Name: C312 (18EE62 – Power System Analysis – I)

C302.1	Show understanding of per unit system, its advantages and computation.
C302.2	Perform short circuit analysis on a synchronous machine and simple power system to select a circuit breaker for the system.
C302.3	Evaluate symmetrical components of voltages and currents in un-balanced three phase circuits.
C302.4	Explain the concept of sequence impedance and sequence networks of power system components and power system.
C302.5	Analyse three phase synchronous machine and simple power systems for different unsymmetrical faults using symmetrical components.
C302.6	Discuss the dynamics of synchronous machine, stability and types of stability.

Course Name: C313 (18EE63 Digital Signal Processing)

C303.1	Compute the DFT of various signals using its properties.
C303.2	Use the DFT to compute the linear and circular convolution and linear filters of long sequence.
C303.3	Apply fat and efficient algorithm for computing DFT and IDFT.
C303.4	Design of IIR Butterworth digital filters using impulse invariant/BT.
C303.5	Design of IIR digital filter using Impulse invariant/Bilinear transformation.
C303.6	Design of FIR filters using wind functions and frequency sampling method and realization of IIR and FIR filters

Course Name: C314 (18EE644Embedded Systems)

C304.1	To understand the concepts of Embedded system design concepts, components , ROM variants, RAM, SOC.
C304.2	To understand about the various modules of microcontroller core architecture
C304.3	To Apply technological aspects to various interfacing with devices such as ADC ,DAC
C304.4	To Elaborate various design trade-offs..
C304.5	To Apply software aspects and programming concepts to the design of Embedded System.
C304.6	To Explain how to interface subsystems with external systems

Course Name: C315 (18ME657 Non-Conventional Energy Sources)

C305.1	Describe the environmental aspects of non-conventional energy resources. In Comparison with various conventional energy systems, their prospects and limitations.
C305.2	Know the need of renewable energy resources, historical and latest developments
C305.3	Describe the use of solar energy and the various components used in the energy production with respect to applications like heating, cooling, desalination, power generation, drying, cooking etc
C305.4	Appreciate the need of Wind Energy and ocean and tidal energy the various components used in energy generation and know the classifications
C305.5	Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications
C305.6	Acquire the knowledge of fuel cells, OTEC and geothermal principles and applications Compare Solar, Wind and bio energy systems, their prospects, Advantages and limitations.

Course Name: C316 (18EEL66 – Control Systems Laboratory)

C306.1	Utilize software package and discrete components in assessing the time and frequency domain response of a given second order system.
C306.2	Design, analyze and simulate Lead, Lag and Lag – Lead compensators for given specifications.
C306.3	Determine the performance characteristics of ac and DC servomotors and synchro-transmitter receiver pair used in control systems
C306.4	Simulate the DC position and feedback control system to study the effect of P, PI, PD and PID controller and Lead compensator on the step response of the system
C306.5	Develop a script files to plot Root locust to study the stability of the system
C306.6	Develop a script files to plot Bode plot and Nyquist plot to study the stability of the system

Course Name: C316 (18EEL67 – Digital Signal Processing Laboratory)

C307.1	Explain physical interpretation of sampling theorem in time and frequency domains.
C307.2	Evaluate the impulse response of a system
C307.3	Perform convolution of given sequences to evaluate the response of a system
C307.4	Compute DFT and IDFT of a given sequence using the basic definition and/or fast methods.
C307.5	Provide a solution for a given difference equation.
C307.6	Design and implement IIR and FIR filters

Course Name: C317 (18EEMP68 – Mini Project)

C308.1	Present the mini-project and be able to defend it
C308.2	Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task.
C308.3	Habituated to critical thinking and use problem solving skills
C308.4	Communicate effectively and to present ideas clearly and coherently in both the written and oral forms.
C308.5	Work in a team to achieve common goal
C308.6	Learn on their own, reflect on their learning and take appropriate actions to improve it.

Course Name: C401 (18EE71 - Power System Analysis-2)

COURSE CODE	**COURSE OUTCOMES**
C401.1	Formulate network matrices and models for solving load flow problems
C401.2	Perform steady state power flow analysis of power systems using numerical iterative techniques
C401.3	Solve issues of economic load dispatch and unit commitment problems.
C401.4	Show knowledge of optimal operation of generators on a bus bar, optimal unit commitment; discuss optimal scheduling for hydrothermal system, power system security and reliability
C401.5	Analyze short circuit faults in power system networks using bus impedance matrix
C401.6	Perform numerical solution of swing equation for multi – machine stability

Course Name: C402 (18EE72 - Power System Protection)

COURSE CODE	COURSE OUTCOMES
C402.1	To discuss performance of protective relays, components of protection scheme and relay terminology and to explain relay construction and operating principles.
C402.2	To explain Overcurrent protection using electromagnetic and static relays and Overcurrent protective schemes
C402.3	To discuss types of electromagnetic and static distance relays, effect of arc resistance, power swings, line length and source impedance on performance of distance relays
C402.4	To discuss pilot protection; wire pilot relaying and carrier pilot relaying. And also to discuss construction, operating principles and performance of various differential relays for differential protection
C402.5	To discuss protection of generators, motors, Transformer and Bus Zone Protection.
C402.6	To explain the principle of circuit interruption and different types of circuit breakers and to describe the construction and operating principle of different types of fuses and to give the definitions of different terminologies related to a fuse

Course Name: C403 (18EE734 – Advanced Control Systems)

COURSE CODE	COURSE OUTCOMES
C403.1	Discuss state variable approach for linear time invariant systems in both the continuous and discrete time systems and to develop of state models for linear continuous–time and discrete–time systems
C403.2	Apply vector and matrix algebra to find the solution of state equations for linear continuous–time and discrete–time systems
C403.3	Define controllability and observability of a system and test for controllability and observability of a given system
C403.4	Design pole assignment and state observer using state feedback
C403.5	Develop the describing function for the nonlinearity present to assess the stability of the system.
C403.6	Develop Lyapunov function for the stability analysis of nonlinear systems.

Course Name: C403 (18EE742 – Utilization of Electrical Power)

COURSE CODE	COURSE OUTCOMES
C404.1	Able to discuss electric heating, air-conditioning and electric welding.
C404.2	To explain laws of electrolysis, extraction and refining of metals and electro deposition, terminology of illumination, laws of illumination, construction and working of electric lamps.
C404.3	Able to Design interior and exterior lighting systems- illumination levels for factory lighting- flood lighting-street lighting.
C404.4	To discuss systems of electric traction, speed time curves and mechanics of train movement.
C404.5	Able to Explain the motors used for electric traction and their control and discuss braking of electric motors, traction systems and power supply and other traction systems
C404.6	Able to explain the working of electric and hybrid electric vehicles

Course Name: C405 (18AU754 - Introduction To Electric Vehicle)

COURSE CODE	COURSE OUTCOMES
C405.1	Explain the need, past, present and future of EVs & Its Recent Development
C405.2	Describe basic terms of Electric Vehicles
C405.3	Describe the electrical vehicle parameters
C405.4	Explain major components of battery operated EVs
C405.5	Describe the energy storage technologies used in EVs
C405.6	Describe the energy storage technologies like fuel cells

Course Name: C406 (18EEL76-Power System Simulation Lab)

COURSE CODE	COURSE OUTCOMES
C406.1	Develop a program in MATLAB to assess the performance of medium and long transmission lines.
C406.2	Develop a program in MATLAB to obtain the power angle characteristics of salient and non-salient pole alternator and assess the transient stability under three phase fault at different locations in a of radial power systems.
C406.3	Develop programs in MATLAB to formulate bus admittance and bus impedance matrices of interconnected power systems.
C406.4	Use Mi-Power package to solve power flow problem for simple power systems.
C406.5	Use Mi-Power package to study unsymmetrical faults at different locations in radial power systems
C406.6	Use of Mi-Power package to study optimal generation scheduling problems for thermal power plants

Course Name: C407 (18EEL77-High Voltage & Relay Lab)

COURSE CODE	COURSE OUTCOMES
C407.1	Experimentally verify the characteristics of over current, over voltage, under voltage and negative sequence relays both electromagnetic and static type.
C407.2	Experimentally verify the characteristics of microprocessor based over current, over voltage, under voltage relays and distance relay
C407.3	Show knowledge of protecting generator, motor and feeders
C407.4	Analyze the spark over characteristics for both uniform and non-uniform configurations using High AC and DC voltages
C407.5	Draw electric field and measure the capacitance of different electrode configuration models
C407.6	Show knowledge of generating standard lightning impulse voltage to determine efficiency, energy of impulse generator and 50% probability flashover voltage for air insulation

Course Name: C408 (18EEP78-Project Work)

COURSE CODE	COURSE OUTCOMES
C408.1	Demonstrate a sound technical knowledge of their selected project topic
C408.2	Undertake problem identification & formulation and solution
C408.3	Design engineering solutions to complex problems utilising a systems approach
C408.4	Communicate with engineers and the community at large in written an oral forms
C408.5	Designing a solution taking into consideration of economical & social responsibilities
C408.6	Providing suitable path towards life long learning skills

Course Name: C411 (18EE81 - Power System Operation and control)

COURSE CODE	COURSE OUTCOMES
C411.1	Describe various levels of controls in power systems, the vulnerability of the system, components, architecture and configuration of SCADA and Solve unit commitment problems
C411.2	Explain issues of hydrothermal scheduling and solutions to hydro thermal problems
C411.3	Explain basic generator control loops, functions of Automatic generation control, speed governors
C411.4	Develop and analyze mathematical models of Automatic Load Frequency Control
C411.5	Explain automatic generation control, voltage and reactive power control in an interconnected power system.
C411.6	Explain reliability, security, contingency analysis, state estimation and related issues of power systems.

Course Name: C412 (18EE821 - FACTS and HVDC Transmission)

COURSE CODE	COURSE OUTCOMES
C412.1	Discuss transmission interconnections, flow of Power in an AC System, limits of the loading capability, dynamic stability considerations of a transmission interconnection and controllable parameters.
C412.2	Explain the basic concepts, definitions of flexible ac transmission systems and benefits from FACTS technology
C412.3	Describe shunt controllers, Static Var Compensator and Static Compensator for injecting reactive power in the transmission system in enhancing the controllability and power transfer capability
C412.4	Describe series Controllers Thyristor-Controlled Series Capacitor (TCSC) and the Static Synchronous Series Compensator (SSSC) for control of the transmission line current.
C412.5	Explain advantages of HVDC power transmission, overview and organization of HVDC system.
C412.6	Describe the basic components of a converter, the methods for compensating the reactive power demanded by the converter. Explain converter control for HVDC systems, commutation failure, control.

Course Name: C413 (18EEP83-Project Work Phase 2)

COURSE CODE	COURSE OUTCOMES
C413.1	Demonstrate a sound technical knowledge of their selected project topic
C413.2	Undertake problem identification & formulation and solution
C413.3	Design engineering solutions to complex problems utilising a systems approach
C413.4	Communicate with engineers and the community at large in written an oral forms
C413.5	Designing a solution taking into consideration of economical & social responsibilities
C413.6	Providing suitable path towards life long learning skills

Course Name: C414 (18EES84 - Seminar)

COURSE CODE	COURSE OUTCOMES
C414.1	Attain, use and develop knowledge in the field of electrical and electronics engineering and other disciplines through independent learning and collaborative study
C414.2	Identify, understand and discuss current, real-time issues
C414.3	Improve oral and written communication skills
C414.4	Explore an appreciation of the self in relation to its larger diverse social and academic contexts.
C414.5	Apply principles of ethics and respect in interaction with others
C414.6	Work in a team to achieve common goal.

Course Name: C415 (18EEI85 - Internship)

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COURSE CODE	COURSE OUTCOMES
C415.1	Gain practical experience within industry in which the internship is done
C415.2	Apply knowledge and skills learned to classroom work
C415.3	Develop a greater understanding about career options while more clearly defining personal career goals
C415.4	Develop and refine oral and written communication skills.
C415.5	Expand intellectual capacity, credibility, judgment, intuition.
C415.6	Acquire the knowledge of administration, marketing, finance and economics

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DEPARTMENT OF MECHANICAL ENGINEERING

Course Name	**Introduction to Mechanical Engineering**
Course Code	BESCK104D/204D

CO. No.	**Statements**
C104.1	Understand the concept of non renewable and renewable energy and the working principles of different types of boilers and accessories.
C104.2	Learn the basic principles of operations of steam , water and gas turbines, IC Engines
C104.3	Understand the concept of refrigeration and air conditioning systems
C104.4	Gains knowledge on material joining processes, understands the concept of lubrication and different types of bearings.
C104.5	Get exposure to machining operations on lathe , milling , drilling and grinding machines
C104.6	Understands the principle of power transmissions through belt drives and gear trains

Course Name	**Computer Aided Engineering Drawing**
Course Code	BCEDK203/203

CO. No.	**Statements**
C112.1	Understand the importance of engineering drawing as language of engineers.
C112.2	Able to draw the front, top and side views of points and straight lines.
C112.3	Able to draw the orthographic projections of regular plane surfaces in different orientations.
C112.4	Develops skill to imagine and draw the projections of regular solids.
C112.5	Understand the concept of the development of lateral surfaces of regular solids.
C112.6	Develop skill to generate 3D views like isometric projection of different types of solids and combination solids.

Course Name	Metal casting, Forming and Joining Processes
Course Code	**IPCC 21ME32**

CO. No.	**Statements**
C202.1	An understanding of the basic concepts of heat treatment process and its influences on properties of metal.
C202.2	An understanding of types of structures, imperfections in metals, diffusion mechanism, evaluation of mechanical properties by subjecting to various stresses and failure mechanism.

C202.3	An understanding of the basic concepts of phase transformation during solidification, phase diagrams, iron carbon equilibrium diagram, classifications of steel, iron, AL, CU and it's alloys .
C202.4	An understanding of the basic concepts of classification, fabrication and applications of composite materials.
C202.5	To understand the various processes for manufacturing of composites and obtain a knowledge of contemporary issues and an ability to use the skills and techniques in engineering practice
C202.6	An ability to use the techniques, skills and modern engineering tools necessary for engineering practice and lifelong learning.

Course Name	**Thermodynamics**
Course Code	PCC 21ME34

CO. No.	**Statements**
C203.1	Understand the fundamentals of thermodynamics.
C203.2	Demonstrate the work and heat transfer in thermodynamic systems.
C203.3	Formulate the heat, work and energy of the system for various thermodynamic processes.
C203.4	Evaluate the performance of heat engines, heat pumps and refrigerators.
C203.5	Analyze the entropy change for various thermodynamic processes and thermodynamic properties of pure substances.
C203.6	Impart the knowledge in thermodynamic relations and distinguish between ideal and real gases.

Course Name	**Mechanics of Materials**
Course Code	PCC 21ME44

CO. No.	**Statements**
C204.1	Learn basic concepts of simple stress and strain.
C204.2	Understand importance of stresses in composite sections, principal stresses and strains.
C204.3	Analyze the stresses in thick and thin cylinders.
C204.4	Draw shears force and bending moments.
C204.5	Gain knowledge on bending and shear stresses, deflection of beams.
C204.6	Impart knowledge of torsion of circular shafts and stability of columns.

Course Name	**Metal Casting and Welding – I**
Course Code	**18ME35A**

CO. No.	**Statements**
C205.1	Understand basic concept of foundry technology and identify various types of patterns, binders, additives, core, molding machines.

C205.2	Analyze working principle of gating and risering systems, special molding processes
C205.3	Describe different furnaces used for melting of metals and special types of casting process.
C205.4	Demonstrate different methods of welding in the application of fabrication works, and joining of two metals/alloys.
C205.5	Apply the concept of special types of welding, brazing and soldering.
C205.6	Enhance the knowledge of metallurgical aspect in welding.
Course Name	**Computer Aided Machine Drawing**
Course Code	PCC 21MEL35

CO. No.	**Statements**
C206.1	Student will be able to sketch sections of solids of various polyhedrons, and also visualize and draw orthographic views of simple machine parts.
C206.2	Student is able to understand and draw various thread forms, standard keys,
C206.3	Understanding of various types riveted joints and their drawings, couplings using memorable drawing
C206.4	The students are able to visualize and prepare detailed drawing of a given part and draw
C206.5	CO-5 Read and interpret a given drawing and Create 2-D and 3-D models using solid edge software with manufacturing purposes.
C206.6	Producing detailed sectional views drawing of a 3-D models using solid edge Software with parts list.

Course Name	**Metallography & Material Testing Lab**
Course Code	IPCC 21ME42

CO. No.	**Statements**
C207.1	e Students will be able to demonstrate the knowledge and the skills required for the conduction of Tensile, Shear and Compression test.
C207.2	The students will be able to determine the torsional and bending strength of different materials.
C207.3	e students will learn Identification of metals based on Microstructures.
C207.4	e students will be capable of detecting the defects like cracks, flaws in materials by using different NDT methods.
C207.5	e students will know the material behaviour for impact and wear loads.
C207.6	e students will be capable of determining hardness of metals using different methods.

Course Name	**Foundry & Forging Lab**
Course Code	IPCC 21ME32

CO. No.	Statements
C208.1	Demonstrate various skills of sand preparation, molding.
C208.2	Conduct tests on foundry sands to determine properties for different ingredient compositions.
C208.3	Apply knowledge of design and practices of mould and pattern making.
C208.4	Analyze the design of gating system.
C208.5	Demonstrate various skills of forging operations.
C208.6	Work as a team keeping up ethical principles.

Course Name	Mechanical Measurements & Metrology
Course Code	PCC 21MEL46

CO. No.	Statements
C210.1	Students shall demonstrate the knowledge associated with Comparators (Mech, Optical, and Electrical& Pneumatic), Use of Sine bar, Interferometer, and measurement of Screw threads & Gear tooth parameters.
C210.2	Students shall demonstrate the knowledge associated with Generalized Measurement system, Transducers, CRO, Oscillographs, and XY Plotters.
C210.3	Students shall demonstrate the knowledge associated with Measurement of Force, Torque, and Temperature& Strain measurement.
C210.4	Students shall demonstrate the knowledge associated with various Standards of length, Use of slip gauges, and System of limits, fits and tolerance and Design of Gauges.
C210.5	Students will be able to work in Quality control and quality assurances divisions in industries.
C210.6	Students will be able to design a sensors and transducers used for stress analysis, design measuring equipments for the measurement of temperature and flow, to maintain quality in engineering products.

Course Name	Applied Thermodynamics
Course Code	18ME43

CO. No.	Statements
C211.1	Describe the application; apply the concepts of combustion thermodynamics in engineering field.
C211.2	Analyze and implement various aspects of air standard cycles and basic concepts of gas power cycles.
C211.3	Evaluate the performance of various working aspects of internal combustion engines

C211.4	Understand the different concepts and implement various vapour power cycles, Analyze the concepts and functioning of reciprocating compressors.
C211.5	Apply knowledge of working procedure of gas turbine and Jet and Rocket Propulsion system.
C211.6	Describe the various psychometric processes; understand the working of air conditioning systems and refrigeration systems.

Course Name	**Kinematics of Machines**
Course Code	**18ME42**

CO. No.	**Statements**
C212.1	To identify and select the proper mechanisms for the application in real life situations.
C212.2	Calculate mobility for various mechanisms and enumerate rigid links and types of joints within mechanisms.
C212.3	Explain different mechanisms and conduct a velocity and acceleration analysis of the different mechanisms.
C212.4	Construct CAM profile for the specific follower motion.
C212.5	To identify different gear trains for various practical applications and solve simple problems.
C212.6	To classify gears and calculate the various spur gear dimensions.

Course Name	**Machine Tools and Operations**
Course Code	**18ME45B**

CO. No.	**Statements**
C213.1	Understand metal cutting principles, cutting tool materials, properties and also fluid selection.
C213.2	Classify and understand the principle and constructional features, operations performed on Lathe & drilling machine.
C213.3	Understand and to operate the Milling machine and to know the concept of indexing mechanism and its methods.
C213.4	Understand the concept of Grinding machines and its constructional features. And also to know the selection of grinding wheel.
C213.5	Understand the principles, applications and features of super finishing, polishing and buffing operations, honing etc.
C213.6	Select the types of non-traditional machines and methods of operations along with applications.

Course Name	**Fluid Mechanics**
Course Code	**18ME44**

CO. No.	Statements
C214.1	To impart basic knowledge of fluid, its properties and recognize the various types of fluid flow, Also variation of Pressure in a fluid is at rest.
C214.2	To made them understand the concept of Euler's equation and extracting Bernoullis's equation also to understand and analyze the Head losses in laminar and turbulent flow through pipes.
C214.3	To Contend the importance of flow measurement and use of dimensional analysis to design physical or numerical experiments and to apply dynamic similarity.
C214.4	Can understand the reasons for Major and minor loss of energy through pipe
C214.5	To understand and analyze the Head losses in laminar and turbulent flow through pipes.
C214.6	To learn the concept of Buoyancy and importance of continuity equation and can implement the compressible flow and flow around immersed bodies.

Course Name	Mech. Measurements & Metrology Lab
Course Code	18MEL47B

CO. No.	Statements
C215.1	Understand the basic measurement units and calibrate various measuring devices.
C215.2	Use various measuring tools such as Sine Bar, Sine Center, Bevel Protractor to find taper and included angles.
C215.3	Gain knowledge on Optical Microscope, Tool Maker Microscope to measure screw thread parameters.
C215.4	Learn basic concepts of measuring temperature, pressure and strain using different methods.
C215.5	Gain knowledge on various measuring equipments applied to engineering analysis in industries.
C215.6	Impart knowledge of error and correction factors of various measuring devices.

Course Name	Machine Shop
Course Code	18MEL48B

CO. No.	Statements
C216.1	Describe the knowledge and the skills required with respect to the operation, procedure, conduction and analyzing the results of experiments.
C216.2	Perform the operations in lathe machine.
C216.3	Analyze the operations in milling machine and it's mechanism.
C216.4	To know the concepts of grooving operations using Shaping machine.
C216.5	Demonstrate of operations on drilling machine.

C216.6	Impart the knowledge of Eccentric turning using four jaw chuck

Course Name	**Management and Entrepreneurship**
Course Code	**18ME51**

CO. No.	**Statements**
C301.1	Understand the basic concepts of management and development of effective planning process.
C301.2	Understand the principles of organization and Illustrate different organizational structures.
C301.3	Understand the staff selection process, recruitment process and project selection process as well as directing, motivating and controlling.
C301.4	To know how to motivate, directing and controlling the managers and management.
C301.5	Develop entrepreneurship and its concepts pertaining to small scale industries for sustainable development.
C301.6	Understand different schemes of government support to small scale industries and preparation of project report.

Course Name	**Design of Machine Elements-I**
Course Code	**18ME52**

CO. No.	**Statements**
C302.1	Apply the concept of mechanics of materials to estimate the stresses in a machine element & predict failure of components.
C302.2	Analyze failure of components using different theories of failure for static loadings
C302.3	Determine the stress concentration factor for different irregularities and strength of components under different impact loadings.
C302.4	Design the machine components for fatigue failure & also for threaded fasteners.
C302.5	Design of keys, Shafts, cotter & knuckle joint & couplings used for power transmission
C302.6	Design & Analyze the power screws and welded joints for different applications.

Course Name	**Energy and Environment**
Course Code	**18ME562**

CO. No.	**Statements**
C303.1	Describe the working principle of steam power plant and ability to solve problems involving height of chimney to produce a given draft.
C303.2	Apply knowledge of super heater, De-super heater, control of super heaters, economizer
C303.3	Evaluate the various methods of starting diesel engines and need for lubrication.

C303.4	Import the knowledge of Hydrograph, how to draw the hydrograph, flow duration and mass curve and its applications.
C303.5	Apply the knowledge of nuclear energy, solar energy and wind energy.
C303.6	Demonstrate the various energy conversion methods such as Tidal power energy, Ocean thermal energy conversion, geothermal energy and photosynthesis.

Course Name	**Dynamics of Machines**
Course Code	**18ME52**

CO. No.	**Statements**
C304.1	Students will be able to do static and dynamic analysis of different mechanisms subjected to forces using various principles.
C304.2	Students will be able to analyze the concept of friction in different bearings and belt drive.
C304.3	Students will be able to solve the problems on balancing of rotating masses in same and different planes.
C304.4	Analyze the concept of primary & secondary forces of reciprocating masses in different engines.
C304.5	Students will be able to determine the various parameters of governors and its usage.
C304.6	Course content helps the students to analyze gyroscopic effect on different vehicles and Analysis of Cams.

Course Name	**Non Traditional Machining**
Course Code	**18ME554**

CO. No.	**Statements**
C305.1	Students will be able to understand necessity of forming process compared with other manufacturing techniques, and the knowledge of parameters effect on the processing of the wrought products.
C305.2	Students will be able to determine the process, load required and possible reasons for the formation of defects in forged components.
C305.4	Students will be able to apply the knowledge of drawing and extrusion to find out defects and problems occurred in the processes.
C305.5	Students will be able to select the different process, related equipments, and parameters for the fabrication of various sheet metal components.
C305.6	Students will be able to select the different high energy rate forming process and powder metallurgy for the fabrication of bulk components.

Course Name	**Turbo Machines**
Course Code	**18ME53**

CO. No.	**Statements**

C306.1	Understanding the comparison of positive displacement machine and turbo machine.
C306.2	Gain the knowledge of working of centrifugal pumps.
C306.3	Study the performance of various hydraulic turbines.
C306.4	Impart the knowledge of performance of steam turbines.
C306.5	Sound knowledge of energy transfer in turbomachinary.
C306.6	Sound knowledge about stage efficiency, reheat factor and preheat factors in turbines and pumps, compression and expansion processes, the working of centrifugal and axial compressors.

Course Name	**Fluid Mechanics & Machines Lab**
Course Code	**18MEL57**

CO. No.	**Statements**
C307.1	Students will able to analyze fluid flow principles.
C307.2	Gain the knowledge in analyzing the performance of turbines and pumps.
C307.3	Able to determine coefficient of friction, minor losses in flow through the pipes.
C307.4	Students will be able to calibrate flow measuring devices such as orifice meter, venture meter and V- Notch and performance of centrifugal pumps.
C307.5	Students will have the ability to test the performance of turbines like Pelton wheel, Francis turbine and Kaplan turbine.
C307.6	Students will have the ability to test the performance of two stages reciprocating air compressor and air blower.

Course Name	**Energy Conversion Lab**
Course Code	**18MEL58**

CO. No.	**Statements**
C308.1	At the end of the course, students will be able to determine the Flash point, Fire point, calorific value and viscosity of various lubrication oils.
C308.2	Students will have the knowledge of engine operation through valve timing diagram.
C308.3	To conduct performance test on Two stroke Petrol Engine.
C308.4	To conduct performance test on 4 stroke Diesel Engine, Four Stroke Petrol Engines.
C308.5	Students able to draw valve timing and port timing diagram.
C308.6	Impart the knowledge of application of planimeter.

Course Name	**Computer Integrated Manufacturing**
Course Code	**18ME62**

CO. No.	Statements
C309.1	Understand basic concepts of computer integrated Manufacturing, utilization parameters of machine and their capabilities
C309.2	Apply different work transfer methods and mechanism for high volume production
C309.3	Design automated assembly systems for high volume production and analyzes single station, multistation and automated guided vehicle system.
C309.4	Development of various types of computer aided manufacturing and planning systems
C309.5	Enhance various terminology, programming methods of robot and write part program in Robotics & CNC machine.
C309.6	Analyze flow lines and solve problems through line balancing methods for manufacturing

Course Name	Design of Machine Elements-II
Course Code	18ME64

CO. No.	Statements
C310.1	Demonstrate the fundamentals of stress analysis, different stress in curved beams and Design and select power transmission elements.
C310.2	Make proper assumptions with respect to material, size, static and dynamic loads for springs, clutches and brakes.
C310.3	To change the existing design with minimum effort for better result/performance of IC-Engine parts
C310.4	Design of spur and helical gears for different power transmission ratio and to find BHN.
C310.5	Design bevel and worm gears based on strength, dynamic and wear loads.
C310.6	Performance of the rotating components can be increased with better knowledge of lubrication

Course Name	Heat & Mass Transfer
Course Code	18ME63

CO. No.	Statements
C311.1	Provide sound understanding of the basic principles and laws, modes of heat transfer, different types of Fins and fin efficiency.
C311.2	Capability to analyze transient mode of heat transfer and use of Heiselers Charts.
C311.3	To know various heat transfer processes and heat exchangers.
C311.4	Able to analyze different regimes of boiling and condensation.
C311.5	To impart the knowledge of natural and forced convection and non dimensional numbers associated with it.
C311.6	Understand the concept of radiation heat transfer.

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Course Name	**Finite Element Methods**
Course Code	**18ME61**

CO. No.	Statements
C312.1	Learn basic principles of finite element method for analysis of structures.
C312.2	Understand importance of principle of minimum potential energy, Raleigh's Ritz and Galerkin's method to solve engineering problems.
C312.3	Analyze the finite element formulation of 2-D elements and higher order elements.
C312.4	Get exposure the finite element analysis of bars in engineering field.
C312.5	Gain knowledge on the finite element analysis of trusses.
C312.6	Impart knowledge of finite element analysis of beams and heat transfer problems.

Course Name	**Professional Elective-II (automobile engg)**
Course Code	**18ME653**

CO. No.	Statements
C313.1	Learn basic concepts of Mechatronics systems.
C313.2	Understand importance of Transducers and Sensors.
C313.3	Gain knowledge on electrical actuation system and signal conditioning.
C313.4	Learn basic concepts of Microprocessor and number system, logic gates.
C313.5	Gain knowledge on logic function of INTEL 8085A Microprocessor.
C313.6	Impart knowledge of CPU, organization and programming of Microprocessor.

Course Name	**Open Elective-II (Total Quality Management)**
Course Code	**18ME664**

CO. No.	Statements
C314.1	Develop equations of equilibrium , Mohr's diagram & characteristic equation of principal stress for 2D & 3D stress systems
C314.2	Able to identify the possible strain field using compatibility equations. Reducing the complexity by assuming plane stress & plane strain condition.
C314.3	Derive the solutions for a two dimensional problem in Cartesian coordinates using Airy's stress function method and to develop equations of equilibrium for 2D stress system in Polar co-ordinate system.
C314.4	Identify the stress distribution of different parts such as rotating disks & rotating cylinders. To derive equations for torsion of thin open sections & tubes.
C314.5	Derive equation for Radial & Circumferential stresses for disk, cylinders & sphere subjected to thermal loading.

C314.6	Understand the importance of basic theorems to solve practical problems.

Course Name	**Non Traditional Machining**
Course Code	**18ME665**

CO. No.	**Statements**
C314.1	To appreciate the importance of NTM methods and their advantages over conventional methods.
C314.2	To demonstrate the working of USM processes.
C314.3	To operate with the elements of AJM & WJM processes.
C314.4	To gain the knowledge of elements related to ECM & Chemical machining processes.
C314.5	To select an appropriate NTM process for the machining of the components and suitable electrodes of EDM.
C314.6	To correlate specific applications of PAM, LBM and EBM process.

Course Name	**Heat & Mass Transfer Lab**
Course Code	**18MEL67**

CO. No.	**Statements**
C315.1	Understand the concept and mechanism of forced, natural convection taking place in objects of different geometries, the various empirical correlations used in different fluid flow situations.
C315.2	Learn the thermal performance analysis of heat exchangers, their practical applications.
C315.3	At the end of the course, students will be able to understand conduction phenomenon thoroughly in objects of different geometries they can determine the thermal conductivity of composite wall, lagging material and critical heat flux.
C315.4	Understand the performance analysis of vapour compression refrigeration cycle and air conditioning system.
C315.5	Understand the concept of radiation heat transfer.
C315.6	To impart the knowledge non dimensional numbers associated with natural and forced convection.

Course Name	**CAMA Lab**
Course Code	**18MEL68**

CO. No.	**Statements**
C316.1	ble to define the different element types, properties and material models to the different structures being analyzed.
C316.2	udents can able to do the stress analysis of bar, truss, beam and simple mechanical structures and validate the results with theoretical results.
C316.3	udents will carry out static and dynamic analysis of simple beams and bars.

C316.4	udents will be able to analyze the thermal problems like conduction and convection using ANSYS.
C316.5	udents will be able to do Air flow analysis of pipe and flat plate.
C316.6	Student will able to solve thermal and mechanical stress problems**.**
Course Name	**Energy Engineering**
Course Code	**18ME71**

CO. No.	**Statements**
C401.1	Students will be able to understand types of interest and its factors and use them in EMI and loan calculations.
C401.2	Students will be able to characterize different assets based on their Present, equivalent and future worth and judge the best alternative.
C401.3	Students will be able to appreciate depreciation, costing and estimation procedure. Perform tax analysis.
C401.4	Students will be able to Analyze the financial concepts and prepare financial statements for the company.
C401.5	Students will be able to use the knowledge of financial ratios for determining the firm's earning power.
C401.6	Students will be able to demonstrate the concepts of financial and profit planning through suitable budgeting.

Course Name	**Professional Elective - III (vibration)**
Course Code	**17ME742**

CO. No.	**Statements**
C402.1	Understand basic concepts of vibrations & learns to use the Fourier series method to idealize any motion in terms of sine & cosine curves which can be used in vibration analysis
C402.2	Able to write a mathematical model of un damped systems and can deploy the proper method to obtain the natural frequency of the system, which is required in failure analysis.
C402.3	Gains insight into the damped , forced vibrations and develops the skill to utilize the over, under and critically damped systems in different applications
C402.4	Realize the importance of vibration measuring, condition monitoring and methods to avoid vibrations.
C402.5	Learn to idealize any physical system into two DOF systems and determine their natural frequencies & mode shapes
C402.6	Able to solve multi DOF system and obtain their natural frequencies by numerical methods which helps the engineer to design stable system
Course Name	**Professional Elective - III (SMART MATRERIAL)**

Course Code	**(17ME745)**
CO. No.	**Statements**
C403.1	Describe the working principles of hydraulic and pneumatic system and its applications.
C403.2	Apply knowledge of pumps, motors and its application.
C403.3	Evaluate the various types of valves and its applications.
C403.4	Import the knowledge of circuit design, control valves and its applications
C403.5	Learn and apply multi-purpose cylinder applications
C403.6	Describe the working principles of hydraulic and pneumatic system and its applications.

Course Name	**Operation Research**
Course Code	**17ME81**
CO. No.	**Statements**
C404.1	Ability to understand and analyze solution for linear programming problems in industry so that they are able to use resources (capitals, men, machine and materials) more effectively.
C404.2	Students will have the knowledge of optimizing the transportation models, assignment and travelling sales man problems. **Solve** the problem of transporting the products from origins to destinations with least transportation cost.
C404.3	Students will have the analysis of optimizing the Integer Programming models and Queuing theory.
C404.4	Students will have the Understand of Project management techniques: PERT-CPM & crashing techniques to reduce the man, machine and material to increase the profits and reduce the losses.
C404.5	Students will have the knowledge of Game Theory analytical and graphical method problems solving for different types of Job's.
C404.6	Students will have the Describe the Sequencing of different types of Job's to reduce man, machine and material cost to increase the profit.

Course Name	**Professional Elective-IV (Mechatronics)**
Course Code	**17ME753**

CO. No.	**Statements**

C405.1	Understand the present energy scenario and the available non conventional energy sources.
C405.2	Describe the basics of solar radiation geometry and various measurement techniques.
C405.3	Analyze the knowledge gained in tapping the solar energy through solar thermal devices, PV conversion and their performance analysis.
C405.4	Demonstrate the various energy conversion methods such as Wind, Tidal, OTEC and Geothermal.
C405.5	Apply knowledge of Biomass and Hydrogen energy and their impact on environment and sustainability.
C405.6	Understand the present energy scenario and the available Non conventional energy sources.

Course Name	**Additive Manufacturing**
Course Code	**17ME82**

CO. No.	**Statements**
C405.1	Get exposed to concepts of theory of elasticity, importance of stress and strains which are needed to understand the theory of plasticity.
C405.2	They knew about types of strain and plastic deformation of ductile materials.
C405.3	Use different yield criteria and its importance.
C405.4	Realize the importance of experimental verification of stress- strain relationship and bending of beams and use it in design of mechanical components.
C405.5	They can analyze stress; shear and residual stresses are distributed on the different types of beam.
C405.6	Gain knowledge on torsion of circular & non circular shafts.
Course Name	**Experimental Stress Analysis**
Course Code	**(17ME832)**

CO. No.	**Statements**
C406.1	ility to brief about types, mounting and performance of strain gages and wheat stone bridge circuits.
C406.2	dents can aware of about different configurations of strain rosettes and its error minimization.
C406.3	dents can brief about concepts of Photoelasicity, polar scope and calibration of different models.
C406.4	get exposure on Two and Three Dimensional photoelasicity models and techniques
C406.5	ey will understand about Birefringent and Brittle coating methods used in ESA.
C406.6	They can use moire techniques for finding stresses and displacements.
Course Name	**Design Lab**

Course Code	**17MEL76**
CO. No.	**Statements**
C407.1	Understand the concept of natural frequency and damping coefficient in a single DOF vibrating system.
C407.2	To analyze the balancing of rotating masses by using static and dynamic balance.
C407.3	To demonstrate the concept of stress concentration for photo- elastic materials.
C407.4	To determine pressure distribution in journal bearings.
C407.5	To find the principle stresses using strain gauges.
C407.6	Knowing the concepts of whirling of shaft, governor and gyroscope.
Course Name	**CIM & Automation Lab**
Course Code	**17MEL77**

CO. No.	**Statements**
C408.1	To practically relate to concepts discussed in Computer Integrated Manufacturing Course.
C408.2	To write CNC part programs for simulation of machining operations such as Turning, Drilling & Milling.
C408.3	Ability to identify the type of machining centre for the geometry given (cylindrical or prismatic), write the part program, explain the instructions, examine for the error in the program and choose right G and M codes to optimize the program and construct the final geometry by running the simulation using the software.
C408.4	To understand & write programs for Flexible Manufacturing Systems & Robotics.
C408.5	To understand the operating principles and practical applications of hydraulics, pneumatics and electro–pneumatic systems.
C408.6	To apply these learning's to automate & improve efficiency of manufacturing process.

Course Name	**Control Engineering**
Course Code	**17ME73**
CO. No.	**Statements**
C410.1	Describe the concept of control action, types of controllers and its applications relevant to the system.
C410.2	Apply the many inter-relationships in mechanical and electrical models.
C410.3	Evaluate the concept of block diagram reduction technique and SFG.
C410.4	Import the knowledge the step, ramp and impulse input concepts by stability analysis
C410.5	apply the importance of root locus and bode plots
C410.6	Import the knowledge of lead-lag compensator and frequency response analysis.

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Course Name	**Power Plant Engineering**
Course Code	**10ME831**

CO. No.	**Statements**
C411.1	derstand Types of fuels and Equipment used for burning of coal in steam power plant.
C411.2	ppose ash handling, coal handling method in a thermal power plant.
C411.3	fferentiate Diesel engine power plants and Gas turbine power plants.
C411.4	lculate performance of a hydro-electric plant.
C411.5	plain working principle of different types of nuclear power plant.
C411.6	lect the suitability of site for a power plant and Indicate safety aspects of power plant.
Course Name	**Project Phase – II**
Course Code	**(17ME85)**

CO. No.	**Statements**
C413.1	Applying knowledge emerging areas of engineering and technology.
C413.2	Students able to apply engineering concepts with respect to different mechanical streams.
C413.3	Students focusing on more efficiency at most economically.
C413.4	Students improve communication skills, problem analyzing ability, design and development skills.
C413.5	Developing new ideas, creative thinking, improvement in reverse engineering in mechanical engineering related technology.
C413.6	Improve their skills to work in a team as a member, to manage project in interdisciplinary environment and to draw appropriate conclusion.

Course Name	**SEMINAR**
Course Code	**(17MES86)**

CO. No.	**Statements**
C414.1	Enhancing knowledge in emerging area of technology.
C414.2	Students self learning through seminar which may enable in lifelong learning.
C414.3	Improve their skills to work in a team.
C414.4	Improve their knowledge in project management and brought out their concern for ethical valve.

C414.5	Develop new ideas, creative thinking, improve in reverse engineering in related technology.
C414.6	Reduce the stage fear in leadership qualities.

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DEPARTMENT OF MECHATRONICS ENGINEERING

Course Name:C101(BMATE101- Mathematics-I for ME Streams)

C101.1	Apply the knowledge of calculus to solve problems related to polar curves and learn the notion of partial differentiation to compute rate of change of multivariate functions
C101.2	Analyze the solution of linear and nonlinear ordinary differential equations.
C101.3	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume
C101.4	Make use of matrix theory for solving the system of linear equations and compute eigenvalues and eigenvectors
C101.5	Familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/ PYTHON/ SCILAB.

Course Name:C102(BCHEE102- Chemistry for EES)

C102.1	Identify the terms and processes involved in scientific and engineering applications
C102.2	Explain the methods of phenomena of chemistry to describe the engineering processes
C102.3	Solve for the problems in chemistry that are pertinent in engineering applications
C102.4	Apply the basic concepts of chemistry to explain the chemical properties and processes
C102.5	Analyse properties and processes associated with chemical substances in multidisciplinary situations

Course Name:C103(BCEDK103- Computer Aided Engineering Drawing)

C103.1	Draw and communicate the objects with definite shape and dimensions
C103.2	Recognize and Draw the shape and size of objects through different views
C103.3	Develop the lateral surfaces of the object
C103.4	Create a Drawing views using CAD software.
C103.5	***I***dentify the interdisciplinary engineering components or systems through its graphical representation.

Course Name:C104(BESCK104B- Introduction to Electrical Engineering)

C104.1	Understand the concepts of various energy sources and Electric circuits.
C104.2	Apply the basic Electrical laws to solve circuits.
C104.3	Discuss the construction and operation of various Electrical Machines.
C104.4	Identify suitable Electrical machine for practical implementation.
C104.5	Explain the concepts of electric power transmission and distribution, electricity billing, circuit protective devices and personal safety measures.

Course Name:C105(BPLCK105A- Introduction to Web Programming)

C105.2	Explain the historical context and justification for HTML over XHTML
C105.2	Develop HTML5 documents and adding various semantic markup tags
C105.2	Analyse various attributes, values and types of CSS
C105.2	Implement core constructs and event handling mechanisms of JavaScript.

Course Name:C105(BPLCK105B- Introduction to Python Programming)

C105.1	Demonstrate proficiency in handling loops and creation of functions
C105.2	Identify the methods to create and manipulate lists, tuples and dictionaries

C105.3	Develop programs for string processing and file organization
C105.4	Interpret the concepts of Object-Oriented Programming as used in Python

Course Name:C106(BENGK106- Communicative English)

C106.1	UNDERSTANDANDAPPLYTHEFUNDAMENTALSOFCOMMUNICATIONSKILLSINTHEIRCOMMUNICATIONSKILLS.
C106.2	IDENTIFYTHENUANCES OFPHONETICS,INTONATION ANDENHANCEPRONUNCIATION SKILLS.
C106.3	TOIMPARTBASICENGLISHGRAMMARANDESSENTIALS OFLANGUAGESKILLSASPERPRESENTREQUIREMENT.
C106.4	UNDERSTANDANDUSEALLTYPES OFENGLISHVOCABULARY ANDLANGUAGEPROFICIENCY
C106.5	ADOPTTHETECHNIQUESOF INFORMATIONTRANSFERTHROUGHPRESENTATION.

Course Name:C107(SAMSKRUTHIKA KANNADABKSKK107)

C107.1	ಕನ಺ಡಜ್ಞ□, □□ತ□ ಮಣ್ೂ಩ ಕನ಺ಡದ □ಸಜ್ೆ್ಂಡಂಯ ್಄ಣ್ೂ ಄ಏ಺ೋಲಽತ಩ ಿಂ.
C107.2	ಕನ಺ಡ □□ತ□ದ ಪ□ ಐನ್ನ್ಗಽದ ಆಧುನಿಕ ಶಾವಿ ಮಣ್ೂ಩ ಆಧುನಿಕ ಉವ□ಗಳಱ಺ □ಿ೦ಅ್ಂಡಂಕಽಜ ಕಲಣ್ೂ ಙ□□ನ ಓದಿಡ ಮಣ್ೂ಩ ಽನಃಜೆ □ಜ ್ಂಡಂಶಿ಺ಂಷತ಩ ಿಂ.
C107.3	ಽಠ□ ವ್ಯಕಿಗಳ□ □□ತ□ ಮಣ್ೂ಩ □ಸಜ್ೆ್ಂಡಂಯ ಬಡ□ ಄ಏ಺ □ಟಆಸಽ಩ಯಱ಺ ಙ್ೈ□ ಞತ಩ ಿಂ.
C107.4	ಽ್ಂಿಂಡಂ□ಕ ವ□ ಽ಩ಗಳ ಪಽಚಯ □ಟಅವಽಗಳ □ಽ಩□ದ ಽಷಯಗಳಱ಺ ್ಂಡಂ಻ಖಆಂಷ ಖಲನ ಇಬಽತರ ವ□ ಽ಩ಗಳ ಬಡ□ ್ಂಡಂ಻ಖಆಳ□ ಽ ಈಣ್ೂಕ□ ಙ್ೈ□ ಞತ಩ ಿಂ.
C107.5	□ಿ೦ಸಜ್ೆ್ಂಡಂಕ, ಜನಪದ□ಟಪ□ ಽಸ ಕಥನಗಳ ಪಽಚಯ□ಲಆಷ಺ಖ.

Course Name:C107(BALAKE KANNADA-BKBKK107)

C107.1	To understand the necessity of learning of local language for comfortable life.
C107.2	To speak, read and write Kannada language as per requirement.
C107.3	To communicate (converse) in Kannada language in their daily life with kannada speakers.
C107.4	To Listen and understand the Kannada language properly.
C107.5	To speak in polite conservation.

Course Name:C108(Scientific Foundations of Health-BSFHK158)

C108.1	To understand and analyse about Health and wellness (and its Beliefs) & It's balance for positive mindset
C108.2	Develop the healthy lifestyles for good health for their better future.
C108.3	Build a Healthy and caring relationships to meet the requirements of good/social/positive life.
C108.4	To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future
C108.5	Prevent and fight against harmful diseases for good health through positive mindset.

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Course Name:C111(MATHEMATICS-II FOR ECE STREAM - BMATE201)

C111.1	Understand the applications of vector calculus refer to solenoidal, irrotational vectors, lineintegral and surface integral..
C111.2	Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation
C111.3	To understand the concept of Laplace transform and to solve initial value problems
C111.4	Apply the knowledge of numerical methods in solving physical and engineering phenomena.
C111.5	Get familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB /PYTHON/ SCILAB

Course Name:C112(BPHYE202- Applied Physics for EEE Stream)

C112.1	**Describe** the fundamental principles of the Quantum Mechanics and the essentials of Photonics.
C112.2	**Elucidate** the concepts of conductors, dielectrics and superconductivity.
C112.3	**Summarize** the properties of semiconductors and the working principles of semiconductor devices.
C112.4	**Discuss** the fundamentals of vector calculus and their applications in Maxwell's Equations and EM Waves.
C112.5	**Practice** working in groups to conduct experiments in physics and **Perform** precise and honest measurements.

Course Name:C113(BBEE203- Basic Electronics)

C113.1	Develop the basic knowledge on construction, operation and characteristics of semiconductor devices.
C113.2	Apply the acquired knowledge to construct small scale circuits consisting of semiconductor devices
C113.3	Develop competence knowledge to construct basic digital circuit by make use of basic gate and its function.
C113.4	Construct the conceptual blocks for basic communication system.
C113.5	Apply the knowledge of various transducers principle in sensor system.

Course Name:C114(BESCK204E- Introduction to C Programming)

C114.1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts
C114.2	Apply programming constructs of C language to solve the real world problem
C114.3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
C114.4	Explore user-defined data structures like structures, unions and pointers in implementing solutions
C114.5	Design and Develop Solutions to problems using modular programming constructs using functions

Course Name:C115(BETCK205H- Introduction to Internet of Things (IOT)

C115.1	Describe the evolution of IoT, IoT networking components, and addressing strategies in IoT
C115.2	Classify various sensing devices and actuator types.

C115.3	Demonstrate the processing in IoT.
C115.4	Explain Associated IOT Technologoes
C115.5	Illustrate architecture of IOT Applications

Course Name:C116(BPWSK206- Professional Writing Skills in English)

C116.1	TO UNDERSTAND AND IDENTIFY THE COMMON ERRORS IN WRITING AND SPEAKING.
C116.2	TO ACHIEVE BETTER TECHNICAL WRITING AND PRESENTATION SKILLS.
C116.3	TO READ TECHNICAL PROPOSALS PROPERLY AND MAKE THEM TO WRITE GOOD TECHNICAL REPORTS.
C116.4	ACQUIRE EMPLOYMENT AND WORKPLACE COMMUNICATION SKILLS.
C116.5	TO LEARN ABOUT TECHNIQUES OF INFORMATION TRANSFER THROUGH PRESENTATION IN DIFFERENT LEVEL.

Course Name:C117(BICOK207- Indian Constitution)

C117.1	Analyse the basic structure of Indian Constitution.
C117.2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution
C117.3	know about our Union Government, political structure & codes, procedures.
C117.4	Understand our State Executive & Elections system of India.
C117.5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.

Course Name:C118(BIDTK258- INNOVATION and DESIGN THINKING)

C118.1	Appreciate various design process procedure
C118.2	Generate and develop design ideas through different technique
C118.3	Identify the significance of reverse Engineering to Understand products
C118.4	Draw technical drawing for design ideas

Course Name: C201 (21MAT31 – Transform Calculus, Fourier series and Numerical Techniques)

C201.1	To have an Insight into solving ordinary differential equations by using Laplace transform techniques.
C201.2	Learn to use the Fourier series to represent periodical physical phenomena in engineering analysis.
C201.3	To enable the students to study Fourier Transforms and concepts of infinite Fourier Sine and Cosine transforms.
C201.4	To learn the method of solving difference equations by the z-transform method.
C201.5	To develop proficiency in solving ordinary and partial differential equations arising in engineering applications, using numerical methods.

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Course Name: Course Name: C202 (21MT32 – Analog and Digital Electronics)

C202.1	Understand the operation and Learn the Design of Opamp Active Filters.
C202.2	Understand the Working Principle and Design of Oscillators and Comparators.
C202.3	Understand the Working Principle and Design of 555 timers and Its applications.
C202.4	Understand the operation and Design of Combinational Logic.
C202.5	Understand the Working Principle and Learn the Design of Sequential Logic

Course Name: Course Name: C203 (21MT33 – Material Science and Manufacturing technology)

C203.1	To understand the structure, behaviour and properties of engineering materials.
C203.2	To understand processing and types of composite materials and ceramics.
C203.3	To provide adequate knowledge of Manufacturing technology and casting.
C203.4	To provide knowledge of various welding process in manufacturing.
C203.5	To introduce students to different machine tools to produce components having different shapes and sizes.

Course Name: Course Name: C204 (21MT34 – Mechanics of Solids and Fluids)

C204.1	Gain knowledge of linear elastic properties and stress strain relations.
C204.2	Derive and solve problems on Principal stresses developed in structures.
C204.3	Compute the stress strain for bars, beams, shafts, and column and to apply the concept of dynamic similarity and to apply it to experimental modelling.
C204.4	Gain knowledge of basic properties of fluids, fluid statics.
C204.5	To apply conservation of mass, momentum and energy equation and to determine the discharge of fluid flow.

Course Name: Course Name: C205 (21MTL35 – Machine Drawing and GD and T)

C205.1	To acquire the knowledge of limits, tolerance and fits and indicate them on machine drawings
C205.2	To make drawings using orthographic projections and sectional views
C205.3	To impart knowledge of thread forms, fasteners, keys, joints, couplings and clutches.
C205.4	To understand and interpret drawings of machine components leading to preparation of assembly drawings manually
C205.5	To understand and interpret drawings of machine components leading to preparation of assembly drawings using CAD packages

Course Name: Course Name: C206 (21UH36 – Social Connect and Responsibility)

C206.1	Understand social Responsibility
C206.2	Practice Sustainability and creativity
C206.3	Showcase Planning and organizational skills
C206.4	Communicate effectively and to present ideas clearly and coherently in both the written and oral forms
C206.5	Work in a team to achieve common goal

Course Name: Course Name: C208 (21MT382 – Trends in digital manufacturing)

C208.1	To understand the basic design process and Product life cycle
C208.2	To know the steps involved in Computer sided design
C208.3	To understand basics of Additive manufacturing
C208.4	To gain knowledge on different additive manufacturing techniques
C208.5	To know the process of Reverse Engineering

Course Name: C212 (21MT42 – Electrical Drives and Control)

C212.1	Acquire a basic understanding of electric drives.
C212.2	Understand the drive motor characteristics of both AC and DC Motors.
C212.3	Apply different starting methods for AC and DC motor drives.
C212.4	Gain the knowledge of Conventional and solid-state speed control of D C Drives.
C212.5	Know the concept of conventional and solid-state speed control of A C Drives.

Course Name: C213 (21MT43 – Hydraulics and Pneumatics)

C213.1	To gain basic knowledge of hydraulic and pneumatic systems.
C213.2	To Understanding the working principles of hydraulics and pneumatics components.
C213.3	To Apply the knowledge of hydraulic systems to design hydraulic circuits for different application.
C213.4	To Apply the knowledge of pneumatic systems to design pneumatic circuits for different application.
C213.5	To Design hydraulic and pneumatic circuits with multi cylinder applications using solenoid control.

Course Name: C214 (21MT44 – Microcontrollers and its applications)

C214.1	Microcontrollers, microprocessors, Different memory Architecture, interfacing techniques and 8051 architectures.
C214.2	Assembly language instructions, data types and application programming.
C214.3	C language instructions, data types and application programming, generating delays for different time delay.
C214.4	Serial communication between two devices using assembly and C language programming, Interrupt handling and counter application using assembly and C language.
C214.5	The controller to real-world devices such as switches, display devices, motors, converters.

Course Name: C215 (21BE45 – Biology for Engineers)

C215.1	Elucidate the basic biological concepts via relevant industrial applications and case studies
C215.2	Evaluate the principles of design and development, for exploring novel bioengineering projects
C215.3	Corroborate the concepts of biomimetics for specific requirements
C215.4	Think critically towards exploring innovative biobased solutions for socially relevant problems

Course Name: C216 (21MTL46 – Mechatronics Lab)

C216.1	Study assembly language and C programming in 8051 for different applications.
C216.2	Study interfacing of various peripherals using 8051.
C216.3	Develop applications like generating waveforms, LCD display, stepper and DC motor control.
C216.4	Develop applications like temperature control etc. using 8051.
C216.5	Calibrate the sensors like LVDT, load cell and Thermo couple.

Course Name: Course Name: C207 (21CIP37 – Constitution of India and Professional Ethics)

C207.1	Have constitutional knowledge and legal literacy
C207.2	Understand Engineering and Professional Ethics and Responsibilities of Engineers

Course Name: C218 (21MT481 – Programming in Python)

C218.1	Demonstrate the use of Anaconda or PyCharm IDE to create Python Applications.
C218.2	Develop Python programming language to develop programs for solving real-world problems
C218.3	Utilize Object-Oriented Programming concepts in Python.
C218.4	Analyse the working of various documents like PDF, Word file

Course Name: C219 (21UHV48 – Universal Human Values)

C219.1	Understand and analyse the essentials of human values and skills, self exploration, happiness and prosperity.
C219.2	Evaluate coexistence of the? I? With the body.
C219.3	Identify and evaluate the role of harmony in family, society and universal order.
C219.4	Understand and associate the holistic perception of harmony at all levels of existence.
C219.5	Develop appropriate technologies and management patterns to create harmony in professional and personal lives.

Course Name:C301(18MT51 – TECHNOLOGICAL INNOVATION MANAGEMENT AND ENTREPRENEURSHIP)

C301.1	Explain the field of management, task of the manager, planning and the need of proper staff, recruitment and selection process.
C301.2	Discuss work allocation, the structure of organization, the modes of communication and importance of managerial control in business.
C301.3	To explain need of coordination between the manager and staff in exercising the authority and delegating duties.
C301.4	To explain the social responsibility of business and leadership &concepts of entrepreneurship and the role and importance.
C301.5	Show an understanding of the role and importance of Small Scale Industries, business plan and its presentation.

Course Name: C302 (18MT52 – Design and Analysis of Machine Elements)

C302.1	Gain knowledge of theories of failures, stress concentration.
C302.2	Gain knowledge of machine elements.
C302.3	Understand the techniques in machine elements.
C302.4	Determine the parameters of machine elements subjected to various load condition.
C302.5	Design of various machine elements.

Course Name: C303 (18MT53 –Virtual Instrumentation)

C303.1	Gain knowledge to learn the concepts of developing basic skills necessary for importance Virtual Instrumentation and Lab View.
C303.2	Understand the basic programming concepts used in Virtual Instrumentation and Lab View.
C303.3	Understand various operation using DAQ Devices used in Virtual Instrumentation and Lab View.
C303.4	Diagnosis the problem related types of I/O module, Data Acquisition System and l.
C303.5	Diagnosis the problem related Communication Networks (Bus Systems) using Standard Protocol.

Course Name: C304 (18MT54 – Hydraulics and Pneumatics)

C304.1	Gain knowledge of basics of hydraulic and pneumatic systems.
C304.2	understanding the working principles of hydraulics and pneumatics components
C304.3	Engineering application of hydraulic and pneumatic systems.
C304.4	Apply working principles of Hydraulic and Pneumatic Systems for various applications.
C304.5	Determine cause for hydraulic and pneumatic system break down and performance of hydraulic pumps, motors.

Course Name: C305 (18MT55 – Micro and smart systems technology)

C305.1	Gain knowledge of Smart Materials, Sensors & Actuators, Microsystems
C305.2	Understand the Operation of Smart Devices & Systems.
C305.3	Understand the Operation of Electronic Circuits & Control for MEMS, Methodology of Micro-manufacturing.
C305.4	Understand the Working Methodology of Smart Devices & Systems, Electronic Circuits & Control for MEMS.
C305.5	Understand the Working Methodology of Micro-manufacturing.

Course Name: C306 (18MT56 – Wireless Networks and Communication)

C306.1	Analyze the concepts of different wireless communication systems.
C306.2	Explain the working principles of WBAN, LAN, WPAN, WMAN, WWAN and different wireless technologies.
C306.3	Analyze the concepts of wireless networks and technologies.
C306.4	Illustrate the concepts of adhoc networks, mobile adhocs, Vanets and Mesh networks.
C306.5	Explain Different issues in designing various Wireless networks and wireless communication.

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Course Name: C307 (18MTL57 –Virtual Instrumentation Laboratory)

C307.1	To introduce the fundamental concepts of Scientific Programming using Lab View Analog and digital measurements principles.
C307.2	Data Acquisition operation - basics skills and Creating Virtual Instruments for practical works
C307.3	Develop LabVIEW programming which employs simulating and analyzing the data for real time automation
C307.4	Engage in designing, implementing, analyzing and demonstrating an application using tools in available in LabVIEW through an open ended experiment.
C307.5	Design applications that uses plug in DAQ boards and built in analysis functions to process the data.

Course Name: C308 (18MTL58 – MSST Laboratory)

C308.1	Analyse the behaviour of Mechanical Components for various kinds of loads.
C308.2	Analyse the behaviour of Pressure Sensor for various kinds of Pressures applied
C308.3	Understand and gain ability to choose Materials for desired applications.
C308.4	Analyze and gain ability to choose Materials for desired applications.
C308.5	Understand, Analyze & gain ability to choose Sensors for desired applications.

Course Name: C311 (18MT61 – PLC and SCADA)

C301.1	Gain knowledge to learn the concepts of developing basic skills necessary for importance PLC & SCADA.
C301.2	Understand the basic programming concepts and various Operation using RELAY LOGIC Devices used in PLC and SCADA.
C301.3	Diagnosis the problem related types of I/O module, Data Acquisition System and Communication Networks (Bus Systems) using Standard Protocol.
C301.4	Apply the architecture process involved in programmable logic controller and basic programming skills of PLC using logical instructions.
C301.5	Construct the ladder diagram for PLC using logical instructions, timer and counters, Data Handling instructions and Build the SCADA System for Real time industrial process.

Course Name: C312 (18MT62 – POWER ELECTRONICS)

C302.1	To explain application area of power electronics, types of power electronic circuits and switches their characteristics and specifications.
C302.2	To explain types of power diodes, their characteristics, and the effects of power diodes on RL circuits.
C302.3	To explain the techniques for design, operation and analysis of single phase diode rectifier circuits
C302.4	To explain steady state, switching characteristics and gate control requirements of different power transistors and their limitations.
C302.5	To discuss different types of Thyristors, their operation, gate characteristics and gate control requirements

Course Name: C313 (18MT63 – Computer Aided Machine Drawing)

C303.1	To acquire the knowledge of CAD software and its features and to familiarize the students with Indian Standards on drawing practices.
C303.2	To inculcate understanding of the theory of projection and make drawings using orthographic projections and sectional views.
C303.3	To impart knowledge of thread forms, fasteners, keys, joints and couplings.
C303.4	To make the students understand and interpret drawings of machine components so as to prepare assembly drawings either manually and using CAD packages.
C303.5	To acquire the knowledge of limits, tolerances and fits pertaining to machine drawings.

Course Name: C314 (18MT642 - Rapid Prototyping)

C304.1	Gain knowledge of Selective Laser Sintering , Fusion Deposition Modeling Solid Ground Curing, 3D Printers.
C304.2	Understand the working Principles of various Rapid Prototyping Manufacturing process and Know the applications of Rapid Prototyping Technology
C304.3	Know the applications of Selective Laser Sintering, Fusion Deposition Modelling, Solid Ground Curing, 3D Printers, also software tools like Magic, MMIC.
C304.4	Have fundamental knowledge of Rapid Prototyping process, Selective Laser Sintering, Fusion Deposition Modelling, Solid Ground Curing, 3D Printers, Rapid Tooling, Software and Errors.
C304.5	Understand the working Principles of Selective Laser Sintering, Fusion Deposition Modelling Solid Ground Curing, 3D Printers.

Course Name: C315 (18MT653 - Renewable Energy Sources)

C305.1	Describe the environmental aspects of renewable energy resources. In Comparison with various conventional energy systems, their prospects and limitations.
C305.2	Know the need of renewable energy resources, historical and latest developments
C305.3	Describe the use of solar energy and the various components used in the energy production with respect to applications like heating, cooling, desalination, power generation, drying, cooking etc
C305.4	Appreciate the need of Wind Energy and ocean and tidal energy the various components used in energy generation and know the classifications
C305.5	Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications

Course Name: C316 (18MTL66 – PLC and SCADA Laboratory)

C306.1	To introduce the fundamental concepts of Scientific Programming using PLC & SCADA Analog and digital measurements principles
C306.2	Data Acquisition operation - basics skills and Creating Industrial application for practical works.
C306.3	Develop the logical instructions involved in Development of programmable logic controller for various operations
C306.4	Construct the Ladder Logic for various operation using PLC and SCADA for industrial Environment.
C306.5	Design the SCADA System for industrial Environment.

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Course Name: C316 (18MTL67 – Power Electronics Laboratory)

C307.1	Verify the characteristics of different power electronic devices.
C307.2	Understand the usage of power devices to control the operation of electronic systems.
C307.3	Understand the characteristics of different power electronic devices.
C307.4	Verify the characteristics of different power electronic devices.
C307.5	Use the power devices to control the operation of electronic systems.

Course Name: C317 (18MTMP68 – Mini Project)

C308.1	Present the mini-project and be able to defend it
C308.2	Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task.
C308.3	Habituated to critical thinking and use problem solving skills
C308.4	Communicate effectively and to present ideas clearly and coherently in both the written and oral forms.
C308.5	Work in a team to achieve common goal

Course Name: C401 (18MT71 – Industrial Robotics)

C401.1	Gain knowledge of Robotics and automation.
C401.2	Understand the working methodology of robotics and automation.
C401.3	Write the program for robot for various applications
C401.4	have knowledge of Robotics, automation, robotics motion, sensors and control, machine vision, robotic programming and roles of robots in industry
C401.5	understand the working methodology of robotics and automation, motion and control, machine vision and programming, application of robots in industry

Course Name: C402 (18MT72 – Thermal Engineering)

C402.1	Gain fundamental knowledge of thermodynamics, and heat transfer.
C402.2	Understand the laws of thermodynamics and heat transfer
C402.3	Formulate and determine thermodynamic and heat transfer parameters.
C402.4	Understand the concepts of system, properties, energy interaction, laws of thermodynamics, and heat transfer, and boundary conditions.
C402.5	Apply laws of thermodynamics and laws of heat transfer to engineering system. Define the thermodynamic process and cycle. Determine the energy interaction

Course Name: C403 (18MT733 – Real Time Systems)

C403.1	Understand the fundamentals of Real-time systems and its classifications.
C403.2	Describe the concepts of computer control and hardware components for RealTime Application
C403.3	Discuss the languages to develop software for Real-Time Applications.
C403.4	Describe the operating system concepts and techniques required for real time systems.
C403.5	Develop the software algorithms using suitable languages to meet Real time applications.

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Course Name: C404 (18MT743 – Artificial Intelligence)

C404.1	To gain Knowledge of Artificial Intelligence, Production Rules, Search algorithms, Expert System & its architectures, Machine Learning.
C404.2	To understand the working methodology of Search Algorithms, Expert System & Machine Learning.
C404.3	Have Knowledge of Artificial Intelligence, Production Rules, Search Algorithms.
C404.4	Have Knowledge of Expert System & its architectures, Machine Learning.
C404.5	Understand the working methodology of Search Algorithms, Expert System & Machine Learning.

Course Name: C406 (18MTL76-Robotics Laboratory)

C406.1	Understand the Importance & Applications of Robots in Virtual Environment.
C406.2	Design the Robots system for Real-time Applications.
C406.3	Analyse the design parameters of Robot for Industrial applications on Robo studio.
C406.4	Develop Robotics Model & workbench prototype for required specifications on Robo studio
C406.5	Develop & Implement the programs on Industrial Robot for various Real time applications.

Course Name: C407 (18MTL77-Thermal Laboratory)

C407.1	The primary objective of this course is to provide the fundamental knowledge necessary to understand the behavior of thermal systems.
C407.2	This course provides a detailed experimental analysis, including the application and heat transfer through solids, fluids, and vacuum.
C407.3	Perform experiments to determine the thermal conductivity of a metal rod
C407.4	Conduct experiments to determine convective heat transfer coefficient for free and forced convection and correlate with theoretical values.
C407.5	Estimate the effective thermal resistance in composite slabs and efficiency in pin-fin

Course Name: C408 (18MTP78-Project Work)

C408.1	Demonstrate a sound technical knowledge of their selected project topic
C408.2	Undertake problem identification & formulation and solution
C408.3	Design engineering solutions to complex problems utilising a systems approach
C408.4	Communicate with engineers and the community at large in written an oral forms
C408.5	Designing a solution taking into consideration of economical & social responsibilities

Course Name: C411 (18MT81 – Automotive electronics and Hybrid Vehicles)

C411.1	Gain knowledge to learn the concepts of developing basic skills necessary for importance of automotive electronics in automobile.
C411.2	Understand the basic concepts and various Operation using Sensor and Actuators used Automobile.
C411.3	Diagnosis the problem related types of, Data Acquisition System and Communication Networks (Bus Systems) Control system using Standard Technology
C411.4	Determine the extent and nature of electronic circuitry in automotive systems including monitoring and control circuits for engines, transmissions, brakes, steering, suspension
C411.5	Analyze climate control, instrumentation and radios and accessories involved in Automotive Industry.

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Course Name: C412 (18MT824 – Management Information Systems)

C412.1	Gain the importance of information in business.
C412.2	Understand the technologies and methods used for effective decision making in an organization
C412.3	Have knowledge on effective applications of information systems in business.
C412.4	Understand the technologies used for effective decision making in an organization.
C412.5	Understand the methods used for effective decision making in an organization.

Course Name: C413 (18MTP83-Project Work Phase 2)

C413.1	Demonstrate a sound technical knowledge of their selected project topic
C413.2	Undertake problem identification & formulation and solution
C413.3	Design engineering solutions to complex problems utilising a systems approach
C413.4	Communicate with engineers and the community at large in written an oral forms
C413.5	Designing a solution taking into consideration of economical & social responsibilities

Course Name: C414 (18MTS84 - Seminar)

C414.1	Attain, use and develop knowledge in the field of electrical and electronics engineering and other disciplines through independent learning and collaborative study
C414.2	Identify, understand and discuss current, real-time issues
C414.3	Improve oral and written communication skills
C414.4	Explore an appreciation of the self in relation to its larger diverse social and academic contexts.
C414.5	Apply principles of ethics and respect in interaction with others

Course Name: C415 (18EEI85 - Internship)

C415.1	Gain practical experience within industry in which the internship is done
C415.2	Apply knowledge and skills learned to classroom work
C415.3	Develop a greater understanding about career options while more clearly defining personal career goals
C415.4	Develop and refine oral and written communication skills.
C415.5	Expand intellectual capacity, credibility, judgment, intuition.

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DEPARTMENT OF MCA

Course Name: Mathematical Foundation for Computer Applications(22MCA11) Year of Study: 2022-23

CO101.1	Apply the fundamentals of set theory and matrices for the given problem.
CO101.2	Apply the types of distribution, evaluate the mean and variance for the given case study/ problem.
CO101.3	solve the given problem by applying the Mathematical logic concepts
CO101.4	Model the given problem by applying the concepts of graph theory.
CO101.5	Design strategy using gaming theory concepts for the given problem.

Course Name: Operating Systems (22MCA12) Year of Study: 2022-23

CO102.1	Analyse the basic Operating System Structure and concept of Process Management
CO102.2	Analyse the given Synchronization/ Deadlock problem to solve and arrive at valid conclusions.
CO102.3	Analyse OS management techniques and identify the possible modifications for the given problem context.
CO102.4	Demonstrate the working of basic commands of Unix environment including file processing
CO102.5	Demonstrate the usage of different shell commands, variable and AWK filtering to the given problem

Course Name: Data Structures (22MCA13) Year of Study: 2022-23

CO103.1	Demonstrate different data structures, its operations using C programming.
CO103.2	Analyse the performance of Stack, Queue, Lists, Trees, Hashing, Searching and Sorting techniques.
CO103.3	Implement some applications of data structures in a high-level language such as C/C++
CO103.4	Design and apply appropriate data structures for solving computing problems.
CO103.5	Compute the efficiency of algorithms in terms of asymptotic notations for the given problem.

Course Name: Computer Networks(22MCA14) Year of Study: 2022-23

CO104.1	Apply the basic concepts of networks like protocol, internet and OSI layers.
CO104.2	Analyze the Physical Layer of 1 and 2
CO104.3	Demonstrate the various Switching networks
CO104.4	Analyze the Data Link Layer of 1 and 2

Course Name: Design and Analysis of Algorithms (22MCA15) Year of Study: 2022-23

CO105.1	Describe the basic algorithm design strategies and use them for devising new solutions to various problems
CO105.2	Analyse algorithms for time/space complexity
CO105.3	Differentiate between deterministic and probabilistic algorithms and use the probabilistic algorithms in appropriate scenarios

Course Name: Research Methodology and IPR (22RMI18) Year of Study: 2022-23

CO108.1	Identify the suitable research methods and articulate the research steps in a proper sequence for the given problem.
CO108.2	Carry out literature survey, define the problem statement and suggest suitable solution for the given problem and present in the format of the research paper (IEEE).
CO108.3	Analyse the problem and conduct experimental design with the samplings.
CO108.4	Perform the data collection from various sources segregate the primary and secondary data
CO108.5	Apply some concepts/section of Copy Right Act /Patent Act /Cyber Law/ Trademark to the given case and develop –conclusions

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Course Name: Database Management System(22MCA21) Year of Study: 2022-23

CO111.1	Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS.
CO111.2	Use Structured Query Language (SQL) for database manipulation and also demonstrate the basic of query evaluation..
CO1113	Design and build simple database systems and relate the concept of transaction, concurrency control and recovery in database.
CO111.4	Develop application to interact with databases, relational algebra expression..
CO111.5	Develop applications using tuple and domain relation expression from queries.

Course Name: Object Oriented Programming with Java(22MCA22) Year of Study: 2022-23

CO112.1	Use object oriented programming concepts to solve real world problems.
CO112.2	Explain the concept of class and objects with access control to represent real world entities
CO112.3	Describe the concept of interface and abstract classes to define generic classes.
CO112.4	Demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords.
CO112.5	Demonstrate the user defined exceptions by exception handling keywords (try, catch, throw, throws and finally)
CO112.6	Understand the process of graphical user interface design and implementation using AWT or swings.
CO112.7	Use different layouts (Flow Layout, Boarder Layout, Grid Layout, Card Layout) to position the controls for developing graphical user interface.

Course Name: Software Engineering (22MCA23) Year of Study: 2022-23

CO113.1	Design a software system, component or process to meet desired needs within realistic constraints.
CO113.2	Assess professional and ethical responsibility.
CO113.3	Function on multi-disciplinary teams.
CO113.4	Use the techniques, skills, and modern engineering tools necessary for engineering practice.
CO113.5	Analyze, design, implement, verify, validate, implement, apply, and maintain software systems or parts of software systems.

Course Name: Web Technologies(22MCA24) Year of Study: 2022-23

CO114.1	Apply the features JQuery for the given web based problem
CO114.2	Demonstrate the development of XHTML documents using JavaScript and CSS.
CO114.3	Illustrate the use of CGI and Perl programs for different types of server side applications.
CO114.4	Design and implement user interactive dynamic web based applications.
CO114.5	Demonstrate applications of Angular JS and JQuery for the given problem.
CO114.6	Apply the concept and usages web based programming techniques.
CO114.7	Learning and Developing XHTML documents using JavaScript and CSS.

Course Name: Data Mining and Business Intelligence (22MCA251) Year of Study: 2022-23

CO1151.1	Analyse the concept of data warehouse, Business Intelligence and OLAP.
CO1151.2	Demonstrate data pre-processing techniques and application of association rule mining Algorithms.
CO1151.3	Apply various classification algorithms and evaluation of classifiers for the given Problem

CO1151.4	Analyse data mining for various business intelligence applications for the given problem.
CO1151.5	Apply classification and regression techniques for the given problem..

Course Name: User Interface Design (22MCA254) Year of Study: 2022-23

CO1154.1	Analyse the new technologies that provide interactive devices and interfaces.
CO1154.2	Apply the guidelines to develop the UID and evaluate for the given problem.
CO1154.3	Apply the development methodologies with an analysis of the social impact and legal issues Understand Direct Manipulation and Virtual Environment
CO1154.4	Discuss the command, natural languages and issues in design for maintaining QoS
CO1154.5	Demonstrate techniques for information search and visualization for the given problem.

Course Name: Artificial Intelligence (22MCA262) Year of Study: 2022-23

CO1162.1	Identify problems that are amenable to solution by AI methods.
CO1162.2	Identify appropriate AI methods to solve a given problem.
C11262.3	Formalize a given problem in the language/framework of different AI methods.
CO1162.4	Implement basic AI algorithms for the given problem.
CO1162.5	Design and carry out an empirical evaluation of different algorithms on problem formalization, and state the conclusions that the evaluation supports.

Course Name: Mobile Application Development (22MCA263) Year of Study: 2022-23

CO1163.1	Describe the requirements for mobile applications
CO1163.2	Explain the challenges in mobile application design and development
CO1163.3	Develop design for mobile applications for specific requirements
CO1163.4	Implement the design using Android SDK, Objective C and iOS
CO1163.5	Deploy mobile applications in Android and iPone marketplace for distribution

Course Name: Data Analytics using Python (20MCA31) Year of Study: 2022-23

CO201.1	Demonstrate basic data analytics principles and techniques
CO201.2	Apply control structures to the given problems.
CO201.3	Illustrate transaction processing, concurrency control techniques and recovery
CO201.4	Demonstrate the concepts of learning and decision trees for a given problem.
CO201.5	Demonstrate the concepts of neural networks and genetic algorithms for a given problem.

Course Name: Internet of Things (20MCA32) Year of Study: 2022-23

CO202.1	Analyse the IoT architecture and design along with functional/compute stack and data management.
CO202.2	Apply IOT architecture for a given problem.
CO202.3	Analyse the application protocol, transport layer methods for the given business case.
CO202.4	Analyse the application of data analytics for IOT for a given.
CO202.5	Analyse the architecture and develop programming using modern tools for the given use case.

Course Name: Advances in Java (20MCA33) Year of Study: 2022-23

CO203.1	Apply the concept of Servlet and its life cycle to create web application.
CO203.2	Apply JSP tags and its services to web application
CO203.3	Create packages and interfaces in the web application context
CO203.4	Build Database connection for the web applications.
CO203.5	Develop enterprise applications using Java Beans concepts for the given problem.

Course Name: Cloud Computing (20MCA342) Year of Study: 2022-23

CO2042.1	Demonstrate the system & software models and mechanisms that support cloud computing.
CO2042.2	Classify various cloud services and their providers.
CO2042.3	Compare various cloud deployment models.
CO2042.4	Differentiate various types of computing environments.
CO2042.5	Identify enabling technologies of cloud computing

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Course Name: Software Project Management (20MCA354) Year of Study: 2022-23

CO2054.1	Apply the practices and methods for successful software project management.
CO2054.2	Identify techniques for requirements, policies and decision making for effective resource management
CO2054.3	Illustrate the evaluation techniques for estimating cost, benefits,schedule and risk.
CO2054.4	Devise a framework for software project management plan for activities, risk, monitoring and control.
CO2054.5	Design a framework to manage people.

Course Name: Advances in Web Technologies (20MCA41) Year of Study: 2022-23

CO201.1	Build the Web Applications using JQuery, PHP, XML for the given problem
CO201.2	Design the Web Pages using AJAX for the given problem.
CO201.3	Analyse the advances in Web2.0 and demonstrate its usage for the problem considered.
CO201.4	Analyse the web services and demonstrate its usage for the problem considered.
CO201.5	Design responsive web applications using Bootstrap for the given problem.

Course Name: Programming using C# (20MCA42) Year of Study: 2022-23

CO202.1	Analyse C# and client-server concepts using .Net Frame Work Components.
CO202.2	Apply delegates, event and exception handling to incorporate with ASP, Win Form, ADO.NET.
CO202.3	Analyze the use of .Net Components depending on the problem statement.
CO202.4	Implement & develop a web based and Console based application with Database connectivity.
CO202.5	Implement & develop a web based application with Database connectivity.

Course Name: Industry Internship (20MCA43) Year of Study: 2022-23

CO203.1	Analyse the real-time industry/research work environment with emphasis on organizational structure/job process/different departments and functions / tools /technology.
CO203.2	Develop applications using modern tools and technologies.
CO203.3	Demonstrate self-learning capabilities with an effective report and detailed presentation.

Course Name: Project Work (20MCA44) Year of Study: 2022-23

CO204.1	Identify a suitable problem making use of the technical and engineering knowledge gained from previous courses with the awareness of impact of technology on the society and their ethical responsibilities.
CO204.2	Work as an individual and team to segregate work and execute/implement projects using appropriate tools.
CO204.3	Develop skills to disseminate technical and general information by means of oral as well as written presentation and professional skills.
CO204.4	To conduct testing of application using appropriate techniques and tools.
CO204.5	To enhance interpersonal skills and group cohesion among the peers during the project work

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DEPARTMENT OF MANAGEMENT STUDIES (MBA)

Course Name: C111 (Principles of Management and Organisational Behaviour- 22MBA11)

C111.1	Gain practical experience in the field of Management and Organization Behaviour
C111.2	Acquire the conceptual knowledge of Management, various functions of Management and theories in Organizational Behaviour.
C111.3	Comprehend and apply management and behavioural models to relate attitude, perception and personality.
C111.4	Analyze the recent trends in Management and OB models.

Course Name: C112 (Entrepreneurship Development- 22MBA12)

C112.1	Display keen interest and orientation towards entrepreneurship, entrepreneurial opportunity Modules in order to setup a business and to think creatively
C112.2	To know about the various business models and B-Plans across Business sectors.
C112.3	Able to understand the importance of marketing and different forms of businesses.
C112.4	Become aware about various sources of funding and institutions supporting Entrepreneurs.
C112.5	Awareness about legal aspects and ways to protect the ideas
C112.6	To understand the ways of starting a business and to know how to foster their ideas.

Course Name: C113 (Accounting for Managers - 22MBA13)

C113.1	Know what and how books of accounts and financial statements are prepared
C113.2	How to interpret financial statements of companies for decision making
C113.3	Independently undertake financial statement analysis and take decisions

Course Name:C114 (Statistics for Managers- 22MBA14)

C114.1	Understand how to organize, manage, and present the data
C114.2	Use and apply a wide variety of specific statistical tools
C114.3	Understand the applications of probability in business
C114.4	Effectively interpret the results of statistical analysis
C114.5	Develop competence of using computer packages to solve the problems

Course Name:C115 (Marketing Management - 22MBA15)

C115.1	Comprehend the concepts of Marketing Management.
C115.2	Gain knowledge on consumer behaviour and buying process
C115.3	Understand concept of Product and Brand Management, Branding and Pricing strategies
C115.4	Identify marketing channels and the concept of product distribution, techniques of sales promotion
C115.5	Simply ideas into a viable marketing plan for various modes of marketing

Course Name:C116 (Business Communication - 22MBA16)

C116.1	The students will be aware of their communication skills and know their potential to become successful managers.
C116.2	The students will get enabled with the mechanics of writing and can compose the business letters in English precisely and effectively.
C116.3	The students will be introduced to the managerial communication practices in business those are in vogue.

C116.4	Students will get trained in the art of drafting business proposals and business communication with emphasis on analyzing business situations.

Course Name: C121 (Human Resource Management -22MBA21)

C121.1	Understand and gain practical experience in the field of Human Resource Concepts, functions and theories.
C121.2	Acquire the conceptual insight of Human Resource and various functions of HR.
C121.3	Apply personnel, managerial and welfare aspects of HR.
C121.4	Perceive greater understanding about HR practices.
C121.5	Perceive knowledge about the future trends in HRM

Course Name: C122 (Financial Management -22MBA22)

C122.1	Understand the basic financial concepts
C122.2	Apply time value of money
C122.3	Evaluate the investment decisions
C112.4	Estimate working capital requirements
C112.5	Analyze the capital structure and dividend decisions

Course Name: C123 (Research Methodology and IPR-20MBA23)

C123.1	Understand various research approaches, techniques and strategies in the appropriate in business
C123.2	Apply a range of quantitative / qualitative research techniques to business and day to day management problems
C123.3	Demonstrate knowledge and understanding of data analysis, interpretation and report writing.
C123.4	Develop necessary critical thinking skills in order to evaluate different research approaches in Business using excel in particular
C123.5	Discuss various forms of the intellectual property, its relevance and business impact in the changing global business environment and leading International Instruments concerning IPR.

Course Name: C124 (Operational Research -22MBA24)

C124.1	Get an insight into the fundamentals of Operations Research and its definition, characteristics and phases
C124.2	Use appropriate quantitative techniques to get feasible and optimal solutions
C124.3	Understand the usage of game theory , Queuing Theory and Simulation for Solving Business Problems
C124.4	Understand and apply the network diagram for project completion

Course Name: C125 (Strategic Management -22MBA25)

C125.1	Students should get clear idea about the concept of Strategic Management, its relevance, Characteristics, process nature and purpose.
C125.2	Student to acquire an understanding of how firms successfully institutionalize a strategy and create an organizational structure for domestic and overseas operations and gain competitive advantage.
C125.3	To give the students an insight on strategy at different levels of an organization to gain competitive advantage.
C125.4	To help students understand the strategic drive in multinational firms and their decisions in different markets.

Course Name: C126 (Managerial Economics - 22MBA26)

C126.1	The student will understand the application of Economic Principles in Management decision making.

C126.2	The student will earn the microeconomic concepts and apply them for effective functioning of a Firm and Industry.
C126.3	The Student will be able to understand, assess and forecast the demand.
C126.4	The student will apply the concepts of production and cost for optimization of production
C126.5	The student will design competitive strategies like pricing, product differentiation etc. and marketing according to the market structure.
C126.6	The student will be able to understand the impact of macroeconomic concepts.

Course Name: C231 (EMERGING EXPONENTIAL TECHNOLOGIES -20MBA301)

C231.1	Identify different emerging technologies
C231.2	Select appropriate technology and tools for a given task
C231.3	Identify necessary inputs for application of emerging technologies
C231.4	Understand the latest developments in the area of technology to support business

Course Name: C232 (Technology & Operational Strategy -20MBA302)

C232.1	Acquire the knowledge about the concepts of production and operation management
C232.2	Demonstrate the basic concepts of process mapping
C232.3	Evaluate the importance of Lean Manufacturing
C232.4	Develop strategies of Total quality management
C232.5	Understand the roles of ISO standards and production system

Course Name: C233 (SERVICES MARKETING -20MBAMM303)

C233.1	Develop an understanding about the various concepts and importance of Services Marketing
C233.2	Enhance knowledge about emerging issues and trends in the service sector
C233.3	Learn to implement service strategies to meet new challenges

Course Name: C234 (MARKETING RESEARCH & ANALYTICS -20MBAMM304)

C234.1	Comprehend the objectives of Market research & its application in solving marketing problems
C234.2	Appreciate the use of different data collection methods, sampling design techniques, measurement methods to analyze the data.
C234.3	Generalize and interpret the data with the help of various measurement techniques
C234.4	To understand the emergence of new trends in research

Course Name: C235 (INVESTMENT MANAGEMENT -20MBAFM303)

C235.1	The student will understand the capital market and various Instruments for Investment.
C235.2	The learner will be able to assess the risk and return associated with investments and methods to value securities.
C235.3	The student will be able to analyse the Economy, Industry and Company framework for Investment Management
C235.4	The student will learn the theories of Portfolio management and also the tools and techniques for efficient portfolio management.

Course Name: C236 (DIRECT TAXATION - 20MBAFM304)

C236.1	Understand the basics of taxation and process of computing residential status.
C236.2	Calculate taxable income under different heads.
C236.3	Understand deductions and calculation of tax liability of Individuals.
C236.4	Know the corporate tax system

Course Name: C237 (RECRUITMENT AND SELECTION -20MBAHR303)

C237.1	Gain the practical insight of various principles and practices of recruitment and selection.
C237.2	Acquire knowledge of latest conceptual framework used in recruitment and selection process and procedure applied in various industries
C237.3	Illustrate the application of recruitment and selection tools and techniques in various sectors.
C237.4	Develop a greater understanding about strategies for workforce planning and assessment, analyse the hiring management system followed in various industries

Course Name: C238 (HUMAN RESOURCE ANALYTICS -20MBAHR304)

C238.1	Gain practical insight of HR Processes, HR analytics and predictive modelling used in HR functions
C238.2	Acquire conceptual knowledge of HRA frameworks, models and approaches.
C238.3	Illustrate the application of datafication of HR, predictive analytics tools and techniques.
C238.4	Analyse the employee data set, considering the various concepts and functions of HR, facilitating the decision making in business context.

Course Name: C239 (INTERNSHIP- 20MBAIN307)

C239.1	Exposure to the working culture of the organisation
C239.2	Application of theoretical culture to real life situation at the work place
C239.3	Understanding of the various functions of the organisation
C239.4	Use of McKinsey's 7S framework and Porter's five force model
C239.5	Analysis of the financial statements

Course Name: C241 (B2B MARKETING MANAGEMENT -20MBAMM401)

C241.1	Understand significance of B2B marketing
C241.2	Ability to create an integrated marketing communications plan which includes promotional strategies.
C241.3	Effectively use marketing communication for customer acquisition
C241.4	Define and apply knowledge of various aspects of managerial decision making related to marketing communications strategy and tactics.

Course Name: C242 (LOGISTICS AND SUPPLY CHAIN MANAGEMENT -20MBAMM402)

C242.1	Demonstrate knowledge of the functions of logistics and supply chain management
C242.2	To relate concepts and activities of the supply chain to actual organizations.
C242.3	Highlight the role of technology in logistics and supply chain management.
C242.4	Evaluate cases for effective supply chain management and its implementation

Course Name: C243 (DIGITAL MARKETING MANAGEMENT -20MBAMM403)

C243.1	Recognize appropriate e-marketing objectives
C243.2	Appreciate the e-commerce framework and technology
C243.3	Illustrate the use of search engine marketing, online advertising and marketing strategies
C243.4	Develop social media strategy's to solve business problems

Course Name: C244 (RISK MANAGEMENT AND INSURANCE - 20MBAFM401)

C244.1	Understand various types of risks.
C244.2	Assess the process of identifying and measuring the risk
C244.3	Acquaint with the functioning of life Insurance in risk management
C244.4	Understand general insurance contract

Course Name: C245 (FINANCIAL DERIVATIVES - 20MBAFM402)

C245.1	Understand the mechanism of forwards/futures, options, financial swaps, various credit derivatives and VaR with their features, merits and demerits

C245.2	Assess the application of forwards/futures, options, financial swaps, various credit derivatives and VaR using numerical problems
C245.3	Application of financial derivatives in risk management
C245.4	Critically evaluate various financial derivatives.

Course Name: C246 (INDIRECT TAXATION - 20MBAFM403)

C246.1	Have clarity about GST system in India
C246.2	Understanding of levy and collection of GST in India
C246.3	Have an overview of customs duty in India
C246.4	Understanding of valuation for customs duty.

Course Name: C247 (ORGANISATIONAL LEADERSHIP - 20MBAHR401)

C247.1	Understand the fundamental concepts and principles, theories of Organizational Leadership.
C247.2	Analyze the organizational leadership style, approaches and traits, its impact on the followers by using leadership theories and instruments
C247.3	Developing better insight in understanding the leadership traits that influence them to work effectively in group.
C247.4	Demonstrate their ability to apply of their knowledge in organizational leadership.

Course Name: C248 (PERSONAL GROWTH AND INTERPERSONAL EFFECTIVENESS - 20MBAHR402)

C248.1	Have in-depth understanding the various personality traits which promotes personal growth
C248.2	Analyze the concepts of human personality, behaviour and functioning of mind
C248.3	Learn and apply the psychometrics tests in understanding the personality traits.
C248.4	Develop the greater insight of self, and others through various theories and prepare the developmental plan for interpersonal effectiveness.

Course Name: C249 (INTERNATIONAL HUMAN RESOURCES MANAGEMENT - 20MBAHR403)

C249.1	Gain conceptual knowledge and practical experience in understanding the HR concepts globally
C249.2	Comprehend and correlate the strategic approaches to HR aspects amongst PCN's, TCN's and HCN's.
C249.3	Develop knowledge and apply the concepts of HR in global perspective
C249.4	Have a better insight of HR concepts, policies and practices by critically analysing the impact of contemporary issues globally.

Course Name: C2410- PROJECT REPORT - (20MBAPR407)

C2410.1	To understand the working of the organization/Company/industry
C2410.2	To take up an in-depth study of an issue/problem in the area of Marketing/Finance/Human Resources
C2410.3	Ability to analyse using statistical tools and statistical packages
C2410.4	Knowledge of comprehending the data collected and editing, tabulating and presenting for analysis.

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DEPARTMENT OF INFORMATION SCIENCE ENGINEERING

Course Name:C101(BMATE101- Mathematics-I for EEE Streams)

C101.1	Apply the knowledge of calculus to solve problems related to polar curves and learn the notion of partial differentiation to compute rate of change of multivariate functions
C101.2	Analyze the solution of linear and nonlinear ordinary differential equations.
C101.3	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume
C101.4	Make use of matrix theory for solving the system of linear equations and compute eigenvalues and eigenvectors
C101.5	Familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/ PYTHON/ SCILAB.

Course Name:C102(BCHEE102- Chemistry for EES)

C102.1	Identify the terms and processes involved in scientific and engineering applications
C102.2	Explain the methods of phenomena of chemistry to describe the engineering processes
C102.3	Solve for the problems in chemistry that are pertinent in engineering applications
C102.4	Apply the basic concepts of chemistry to explain the chemical properties and processes
C102.5	Analyse properties and processes associated with chemical substances in multidisciplinary situations

Course Name:C103(BCEDK103- Computer Aided Engineering Drawing)

C103.1	Draw and communicate the objects with definite shape and dimensions
C103.2	Recognize and Draw the shape and size of objects through different views
C103.3	Develop the lateral surfaces of the object
C103.4	Create a Drawing views using CAD software.
C103.5	***I***dentify the interdisciplinary engineering components or systems through its graphical representation.

Course Name:C104(BESCK104B- Introduction to Electrical Engineering)

C104.1	Understand the concepts of various energy sources and Electric circuits.
C104.2	Apply the basic Electrical laws to solve circuits.
C104.3	Discuss the construction and operation of various Electrical Machines.
C104.4	Identify suitable Electrical machine for practical implementation.
C104.5	Explain the concepts of electric power transmission and distribution, electricity billing, circuit protective devices and personal safety measures.

Course Name:C105(BPLCK105A- Introduction to Web Programming)

C105.2	Explain the historical context and justification for HTML over XHTML
C105.2	Develop HTML5 documents and adding various semantic markup tags
C105.2	Analyse various attributes, values and types of CSS
C105.2	Implement core constructs and event handling mechanisms of JavaScript.

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Course Name:C105(BPLCK105B- Introduction to Python Programming)

C105.1	Demonstrate proficiency in handling loops and creation of functions
C105.2	Identify the methods to create and manipulate lists, tuples and dictionaries
C105.3	Develop programs for string processing and file organization
C105.4	Interpret the concepts of Object-Oriented Programming as used in Python

Course Name:C106(BENGK106- Communicative English)

C106.1	UNDERSTANDANDAPPLYTHEFUNDAMENTALSOFCOMMUNICATIONS KILLSINTHEIRCOMMUNICATIONSKILLS.
C106.2	IDENTIFYTHENUANCES OFPHONETICS,INTONATION ANDENHANCEPRONUNCIATION SKILLS.
C106.3	TOIMPARTBASICENGLISHGRAMMARANDESSENTIALS OFLANGUAGESKILLSASPERPRESENTREQUIREMENT.
C106.4	UNDERSTANDANDUSEALLTYPES OFENGLISHVOCABULARY ANDLANGUAGEPROFICIENCY
C106.5	ADOPTTHETECHNIQUESOF INFORMATIONTRANSFERTHROUGHPRESENTATION.

Course Name:C107(SAMSKRUTHIKA KANNADABKSKK107)

C107.1	ಕನ್ನಡವನ್ನು, ಮತ್ತು ಮಾತನಾಡುವ ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಅರಿವನ್ನು ಅಭಿವೃದ್ಧಿಪಡಿಸುತ್ತಾನೆ.
C107.2	ಕನ್ನಡ ಮತ್ತು ಪರಿಸರದ ಪರಸ್ಪರಾವಲಂಬಿ ಸಂಬಂಧ ಮತ್ತು ಆಯಾಮಗಳ ಬಗ್ಗೆ ಅರಿವು ಮೂಡಿಸಿ ಪರಿಸರ ಸಂರಕ್ಷಣೆಯಲ್ಲಿ ಪಾತ್ರವಹಿಸುತ್ತಾನೆ.
C107.3	ಸಂವಿಧಾನಬದ್ಧ ಮತ್ತು ಮಾನವ ಹಕ್ಕುಗಳ ಬಗ್ಗೆ ಅರಿವು ಮೂಡಿಸುತ್ತಾನೆ.
C107.4	ಸಾಂಸ್ಕೃತಿಕ ವಲಯಗಳ ಪರಿಚಯ ಮತ್ತು ಅವುಗಳ ವೈವಿಧ್ಯತೆಯ ಬಗ್ಗೆ ಅರಿವು ಮೂಡಿಸಿ ಸಾಮರಸ್ಯದ ಜೀವನ ನಡೆಸಲು ಪ್ರೇರೇಪಿಸುತ್ತಾನೆ.
C107.5	ಸಂವಿಧಾನ, ಜನಪದ ಕಲೆಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.

Course Name:C107(BALAKE KANNADA-BKBKK107)

C107.1	To understand the necessity of learning of local language for comfortable life.
C107.2	To speak, read and write Kannada language as per requirement.
C107.3	To communicate (converse) in Kannada language in their daily life with kannada speakers.
C107.4	To Listen and understand the Kannada language properly.
C107.5	To speak in polite conservation.

Course Name:C108(Scientific Foundations of Health-BSFHK158)

C108.1	To understand and analyse about Health and wellness (and its Beliefs) & It's balance for positive mindset
C108.2	Develop the healthy lifestyles for good health for their better future.
C108.3	Build a Healthy and caring relationships to meet the requirements of good/social/positive life.

C108.4	To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future
C108.5	Prevent and fight against harmful diseases for good health through positive mindset.

Course Name:C111(MATHEMATICS-II FOR ECE STREAM - BMATE201)

C111.1	Understand the applications of vector calculus refer to solenoidal, irrotational vectors, lineintegral and surface integral..
C111.2	Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation
C111.3	To understand the concept of Laplace transform and to solve initial value problems
C111.4	Apply the knowledge of numerical methods in solving physical and engineering phenomena.
C111.5	Get familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB /PYTHON/ SCILAB

Course Name:C112(BPHYE202- Applied Physics for EEE Stream)

C112.1	**Describe** the fundamental principles of the Quantum Mechanics and the essentials of Photonics.
C112.2	**Elucidate** the concepts of conductors, dielectrics and superconductivity.
C112.3	**Summarize** the properties of semiconductors and the working principles of semiconductor devices.
C112.4	**Discuss** the fundamentals of vector calculus and their applications in Maxwell's Equations and EM Waves.
C112.5	**Practice** working in groups to conduct experiments in physics and **Perform** precise and honest measurements.

Course Name:C113(BBEE203- Basic Electronics)

C113.1	Develop the basic knowledge on construction, operation and characteristics of semiconductor devices.
C113.2	Apply the acquired knowledge to construct small scale circuits consisting of semiconductor devices
C113.3	Develop competence knowledge to construct basic digital circuit by make use of basic gate and its function.
C113.4	Construct the conceptual blocks for basic communication system.
C113.5	Apply the knowledge of various transducers principle in sensor system.

Course Name:C114(BESCK204E- Introduction to C Programming)

C114.1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts
C114.2	Apply programming constructs of C language to solve the real world problem
C114.3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
C114.4	Explore user-defined data structures like structures, unions and pointers in implementing solutions
C114.5	Design and Develop Solutions to problems using modular programming constructs using functions

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Course Name:C115(BETCK205H- Introduction to Internet of Things (IOT)

C115.1	Describe the evolution of IoT, IoT networking components, and addressing strategies in IoT
C115.2	Classify various sensing devices and actuator types.
C115.3	Demonstrate the processing in IoT.
C115.4	Explain Associated IOT Technologoes
C115.5	Illustrate architecture of IOT Applications

Course Name:C116(BPWSK206- Professional Writing Skills in English)

C116.1	TO UNDERSTAND AND IDENTIFY THE COMMON ERRORS IN WRITING AND SPEAKING.
C116.2	TO ACHIEVE BETTER TECHNICAL WRITING AND PRESENTATION SKILLS.
C116.3	TO READ TECHNICAL PROPOSALS PROPERLY AND MAKE THEM TO WRITE GOOD TECHNICAL REPORTS.
C116.4	ACQUIRE EMPLOYMENT AND WORKPLACE COMMUNICATION SKILLS.
C116.5	TO LEARN ABOUT TECHNIQUES OF INFORMATION TRANSFER THROUGH PRESENTATION IN DIFFERENT LEVEL.

Course Name:C117(BICOK207- Indian Constitution)

C117.1	Analyse the basic structure of Indian Constitution.
C117.2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution
C117.3	know about our Union Government, political structure & codes, procedures.
C117.4	Understand our State Executive & Elections system of India.
C117.5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.

Course Name:C118(BIDTK258- INNOVATION and DESIGN THINKING)

C118.1	Appreciate various design process procedure
C118.2	Generate and develop design ideas through different technique
C118.3	Identify the significance of reverse Engineering to Understand products
C118.4	Draw technical drawing for design ideas