



DON BOSCO INSTITUTE OF TECHNOLOGY, BANGALORE
DEPARTMENT OF COMPUTER SCIENCE ENGINEERING



2018 SCHEME COURSE OUTCOMES

2018 scheme-3rd SEM

Sl. No	Subject Name	Subject Code	Course Outcomes(CO)
1	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES	18MAT31	CO1 Use Laplace transform and inverse Laplace transform in solving differential/integral equation arising in network analysis, control systems and other fields of engineering.
			CO2 Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory
			CO3 Make use of Fourier transforms and Z-transform to illustrate discrete/continuous function arising in wave and heat convection signals and systems
			CO4 Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods
			CO5 Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis
2	DATA STRUCTURES AND APPLICATIONS	18CS32	CO1 Explain fundamentals of data structures and their applications essential for programming/problem solving.
			CO2 Apply searching and sorting operations on files
			CO3 Use stack, Queue, Lists, Trees and Graphs in problem solving
			CO4 Implement all data structures in a high-level language for problem solving.
3	ANALOG AND DIGITAL ELECTRONICS ANALOG AND DIGITAL ELECTRONICS	18CS33	CO1 Design and analyze application of analog circuits using op-amp devices, timer IC, power supply and regulator IC and op-amp
			CO2 Explain the basic principles of A/D and D/A conversion circuits and develop the same.
			CO3 Simplify digital circuits using Karnaugh Map, and Quine-McClusky Methods
			CO4 Explain Gates and flip flops and make use in designing different data processing circuits, registers and counters and compare the types
			CO5 Develop simple HDL programs
4	COMPUTER ORGANIZATION	18CS34	CO1 Explain the basic organization of a computer system
			CO2 Demonstrate functioning of different sub systems, such as processor, Input/output, and memory
			CO3 Illustrate hardwired control and micro programmed control, pipelining, embedded and other computing systems
			CO4 Design and analyse simple arithmetic and logical units
5	SOFTWARE ENGINEERING	18CS35	CO1 Design a software system, component, or process to meet desired needs within realistic constraints
			CO2 Assess professional and ethical responsibility
			CO3 Function on multi-disciplinary teams
			CO4 Use the techniques, skills, and modern engineering tools necessary for engineering practice
			CO5 Analyze, design, implement, verify, validate, implement, apply, and maintain software systems or parts of software systems
			CO6 Identify software quality parameters and quantify software using measurements and metrics. List software quality standards and outline the practices involved

6	DISCRETE MATHEMATICAL STRUCTURES	18CS36	CO1	Use propositional and predicate logic in knowledge representation and truth verification
			CO2	Demonstrate the application of discrete structures in different fields of computer science
			CO3	Solve problems using recurrence relations and generating functions
			CO4	Application of different mathematical proofs techniques in proving theorems in the courses
			CO5	Compare graphs, trees and their applications
7	ANALOG AND DIGITAL ELECTRONICS LABORATORY	18CSL37	CO1	Use appropriate design equations / methods to design the given circuit
			CO2	Examine and verify the design of both analog and digital circuits using simulators
			CO3	Make use of electronic components, ICs, instruments and tools for design and testing of circuits for the given the appropriate inputs
			CO4	Compile a laboratory journal which includes; aim, tool/instruments/software/components used, design equations used and designs, schematics, program listing, procedure followed, relevant theory, results as graphs and tables, interpreting and concluding the findings.
8	DATA STRUCTURES LABORATORY	18CSL38	CO1	Analyze and Compare various linear and non-linear data structures
			CO2	Code, debug and demonstrate the working nature of different types of data structures and their applications
			CO3	Implement, analyze and evaluate the searching and sorting algorithms
			CO4	Choose the appropriate data structure for solving real world problem

2018-5th SEM

Sl. No	Subject Name	Subject Code	Course Outcomes(CO)	
1	MANAGEMENT AND ENTREPRENEURS	18CS51	CO1	Define management, organization, entrepreneur, planning, staffing, ERP and outline their importance in entrepreneurship
			CO2	Utilize the resources available effectively through ERP
			CO3	Compare various types of Entrepreneurs
2	COMPUTER NETWORKS	18CS52	CO1	Explain principles of application layer protocols
			CO2	Outline transport layer services and infer UDP and TCP protocols
			CO3	Classify routers, IP and Routing Algorithms in network layer
			CO4	Explain the Wireless and Mobile Networks covering IEEE 802.11 Standard
			CO5	Define Multimedia Networking and Network Management
3	DATABASE MANAGEMENT SYSTEM	18CS53	CO1	Summarize the concepts of database objects, enforce integrity constraints on a database using RDBMS.
			CO2	Use Structured Query Language (SQL) for database manipulation.
			CO3	Design simple database systems
			CO4	Design code for some application to interact with databases.
4	AUTOMATA THEORY AND COMPUTABILITY	18CS54	CO1	Tell the core concepts in automata theory and Theory of Computation
			CO2	Explain how to translate between different models of Computation (e.g., Deterministic and Non-deterministic and Software models)
			CO3	Interpret Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers
			CO4	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness
			CO5	Classify a problem with respect to different models of Computation.

5	APPLICATION DEVELOPMENT USING PYTHON	17CS553	CO1	Learn the syntax and semantics of Python programming language.
			CO2	Illustrate the process of structuring the data using lists, tuples and dictionaries.
			CO3	Demonstrate the use of built-in functions to navigate the file system
			CO4	Implement the Object Oriented Programming concepts in Python.
			CO5	Appraise the need for working with various documents like Excel, PDF, Word and Others.
6	UNIX PROGRAMMING	17CS564	CO1	Explain Unix Architecture, File system and use of Basic Commands
			CO2	Illustrate Shell Programming and to write Shell Scripts
			CO3	Categorize, compare and make use of Unix System Calls
			CO4	Build an application/service over a Unix system.
7	COMPUTER NETWORK LABORATORY	17CSL57	CO1	Analyze and Compare various networking protocols
			CO2	Demonstrate the working of different concepts of networking
			CO3	Implement and analyze networking protocols in NS2 / NS3
8	DBMS LABORATORY WITH MINI	17CSL58	CO1	Use Structured Query Language (SQL) for database Creation and manipulation.
			CO2	Demonstrate the working of different concepts of DBMS
			CO3	Implement and test the project developed for an application

5th SEM 2017-SCHEME

SL No	Subject Name	Subject Code	Course Outcomes(CO)	
1	MANAGEMENT AND ENTREPRENEURS	17CS51	CO1	Define management, organization, entrepreneur, planning, staffing, ERP and outline their importance in entrepreneurship
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			CO5	Classify a problem with respect to different models of Computation.
5	ADVANCED JAVA AND J2EE	17CS553	CO1	Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficient programs
			CO2	Build client-server applications and TCP/IP socket programs
			CO3	Illustrate database access and details for managing information using the JDBC API
			CO4	Describe how servlets fit into Java-based web application architecture
			CO5	Develop reusable software components using Java Beans

6.	DOT NET FRAMEWORK FOR APPLICATION DEVELOPMENT	17CS564	CO1	Build applications on Visual Studio .NET platform by understanding the syntax and semantics of C#
			CO2	Demonstrate Object Oriented Programming concepts in C# programming language
			CO3	Design custom interfaces for applications and leverage the available built-in interfaces in building complex applications
			CO4	Illustrate the use of generic and collections in C#
			CO5	Compose queries to query in-memory data and define own operator behaviour
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7th SEM 2017-SCHEME

SL No	Subject Name	Subject Code	Course Outcomes(CO)	
1.	WEB TECHNOLOGY AND ITS APPLICATIONS	17CS71	CO1	Define HTML and CSS syntax and semantics to build web pages
			CO2	Understand the concepts of Construct , visually format tables and forms using HTML using CSS
			CO3	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically
			CO4	Last the principles of object oriented development using PHP
			CO5	Illustrate JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features.
2.	ADVANCED COMPUTER ARCHITECTURES	17CS72	CO1	Explain the concepts of parallel computing and hardware technologies
			CO2	Compare and contrast the parallel architectures
			CO3	Illustrate parallel programming concepts
3.	MACHINE LEARNING	17CS73	CO1	Identify the problems for machine learning And select the either supervised, unsupervised or reinforcement learning.
			CO2	Explain theory of probability and statistics related to machine learning
			CO3	Investigate concept learning, ANN, Bayes classifier, k nearest neighbor, Q.
4.	INFORMATION AND NETWORK	17CS743	CO1	Analyze the Digitals security lapses
			CO2	Illustrate the need of key management
5.	UNIX SYSTEM PROGRAMMING	17CS744	CO1	Ability to understand and reason out the working of Unix Systems
			CO2	Build an application/service over a Unix system
6.	STORAGE AREA NETWORKS	17CS754	CO1	Identify key challenges in managing information and analyze different storage networking technologies and virtualization
			CO2	Explain components and the implementation of NAS
			CO3	Describe CAS architecture and types of archives and forms of virtualization
			CO4	Illustrate the storage infrastructure and management activities
7.	MACHINE LEARNING LABORATORY	17CSL76	CO1	Understand the implementation procedures for the machine learning algorithms
			CO2	Design Java/Python programs for various Learning algorithms
			CO3	Apply appropriate data sets to the Machine Learning algorithms
			CO4	Identify and apply Machine Learning algorithms to solve real world problems
8.	WEB TECHNOLOGY LABORATORY	17CSL77	CO1	Design and develop dynamic web pages with good aesthetic sense of designing and latest technical know-how's
			CO2	Have a good understanding of Web Application Terminologies, Internet Tools other web services
			CO3	Learn how to link and publish web sites

2015-5th SEM

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1	MANAGEMENT AND ENTREPRENEURS	15CS51	CO1	Define management, organization, entrepreneur, planning, staffing, ERP and outline their importance in entrepreneurship.
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2	COMPUTER NETWORKS	15CS52	CO1	Explain principles of application layer protocols
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7th SEM 2015-SCHEME

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			CO4	List the principles of object-oriented development using PHP
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			CO2	Compare and contrast the parallel architectures
			CO3	Illustrate parallel programming concepts
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			CO3	Learn how to link and publish web sites

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DON BOSCO INSTITUTE OF TECHNOLOGY, BANGALORE-74
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
(NBA Accredited Department)
COURSE OUTCOMES



3rd SEM 18-SCHEME				
Sl. No	Subject Name	Subject Code	Course Outcomes(CO)	
1	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES	18MAT31	CO1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering
			CO2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory
			CO3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems
			CO4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods
			CO5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis
2	NETWORK THEORY	18EC32	CO1	Determine currents and voltages using source transformation/ source shifting/ mesh/ nodal analysis and reduce given network using star-delta transformation/source transformation/ source shifting
			CO2	Solve network problems by applying Superposition/ Reciprocity/ Thvenin's/ Norton's/ Maximum Power Transfer Millman's Network Theorems and electrical law to reduce circuit complexities and to arrive at feasible solutions
			CO3	Calculate current and voltages for the given circuit under transient conditions
			CO4	Apply Laplace transform to solve the given network
			CO5	Solve the given network using specified two port network parameter like Z or Y or T or h and understand the concept of resonance
			CO6	Understand the concept of resonance
3	ELECTRONIC DEVICES	18EC33	CO1	Understand the principles of semiconductor Physics
			CO2	Analyze the Memory system, speed, size and cost. Demonstrate Computer Types, Functional Units and Basic Understand the principles and characteristics of different types of semiconductor devices
			CO3	Understand the fabrication process of semiconductor devices
			CO4	Utilize the mathematical models of semiconductor junctions and MOS transistors for circuits and systems

4	DIGITAL SYSTEM DESIGN	18EC34	CO1	Explain the concept of combinational and sequential logic circuits
			CO2	Design the combinational logic circuits
			CO3	Design the sequential circuits using SR, JK, D, T flip-flops and Mealy & Moore machines
			CO4	Design applications of Combinational & Sequential Circuits
5	COMPUTER ORGANIZATION AND ARCHITECTURE	18EC35	CO1	Explain the basic organization of a computer system
			CO2	Explain different ways of accessing an input / output device including interrupts
			CO3	Illustrate the organization of different types of semiconductor and other secondary storage memories
			CO4	Illustrate simple processor organization based on Hardwired control and micro programmed control
6	POWER ELECTRONICS AND INSTRUMENTATION	18EC36	CO1	Build and test circuits using power electronic devices
			CO2	Analyze and design controlled rectifier, DC to DC converter, DC to AC inverters and SMPS
			CO3	Define instrument error
			CO4	Develop circuits for multirange Ammeters, Voltmeters and Bridges to measure passive component
			CO5	Describe the principle of operation of Digital instruments and PLCs physical parameters
			CO6	Use instrumentation ammeter for measuring
7	ELECTRONICS DEVICES AND INSTRUMENTATION LABORATORY	18ECL37	CO1	Understand the characteristics of various electronic devices and measurement of parameters using logic gates
			CO2	Design and test simple electronic circuits (comparators, multiplexers and demultiplexers)
			CO3	Use of circuit simulation software for the implementation and characterization of electronic circuits and devices
8	DIGITAL SYSTEM DESIGN LABORATORY	18ECL38	CO1	Demonstrate the truth table of various expressions and combinational circuits using logic gates, using logic gates
			CO2	Design various combinational circuits such as adders, subtractors, comparators, multiplexers and demultiplexers
			CO3	Construct flip-flops, counters and shift registers
			CO4	Simulate Serial adder and Binary Multiplier


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DON BOSCO INSTITUTE OF TECHNOLOGY, BANGALORE-74
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING



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COURSE OUTCOMES

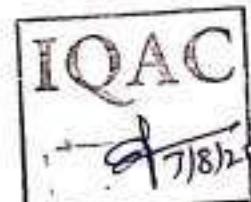
5TH SEM 1B-SCHMIE

SL. No	SUBJECT NAME	Subject Code	Course Outcomes(CO)			
1	TECHNOLOGICAL INNOVATION MANAGEMENT AND ENTREPRENEURSHIP	18ES51	CO1	Understand the fundamental concepts of Management and Entrepreneurship and opportunities in order to setup a business		
			CO2	Describe the functions of Managers, Entrepreneurs and their social responsibilities		
			CO3	Understand the components in developing a business plan		
			CO4	Awareness about various sources of funding and institutions supporting entrepreneurship		
2	DIGITAL SIGNAL PROCESSING	18EC52	CO1	Determine response of LTI systems using time domain and DFT techniques		
			CO2	Compute DFT of real and complex discrete time signals		
			CO3	Computation of DFT using FFT algorithms and linear filtering approach		
			CO4	Design and realize FIR and IIR digital filters		
			CO5	Understand the DSP processor architecture		
3	PRINCIPLES OF COMMUNICATION SYSTEMS	18EC53	CO1	Analyze and compute performance of AM and FM modulation in the presence of noise at the receiver		
			CO2	Analyze and compute performance of digital formatting processes with quantization noise		
			CO3	Multiplex digitally formatted signals at Transmitter and demultiplex the signals and reconstruct digitally formatted signals at the receiver		
			CO4	Design/Demonstrate the use of digital formatting in Multiplexers, Vocoders and Video transmission		
4	INFORMATION THEORY AND CODING	18EC54	CO1	Explanation concept of Dependent & Independent Source, measure of information, Entropy, Rate of Information and Order of a source		
			CO2	Represent the information using Shannon Encoding, Shannon Fano, Prefix and Huffman Encoding Algorithms		
			CO3	Model the continuous and discrete communication channels using input, output and joint probabilities		
			CO4	Determine a codeword comprising of the check bits computed using Linear Block codes, cyclic codes & convolutional codes		
			CO5	Design the encoding and decoding circuits for Linear Block codes, cyclic codes, convolutional codes, BCH and Golay codes		

5	ELECTROMAGNETIC WAVES	18EC55	CO1	Evaluate problems on electrostatic force, electric field due to point, linear, volume charges by applying conventional methods and charge in a volume
			CO2	Apply Gauss Law to evaluate Electric field due to different charge distribution; and Volume Charge distribution by using Divergence Theorem
			CO3	Determine potential and energy with respect to point charge and capacitance using Laplace equation and Apply Bio-Savart's and Ampere's Laws for evaluating Magnetic field for different current configurations
			CO4	Calculate magnetic force, potential energy and Magnetization with respect to magnetic materials and voltage induced in electric circuits
			CO5	Apply Maxwell's equations for time varying fields EM waves in free space and conductors and Evaluate power associated with EM waves using Poynting theorem
6	VERILOG HDL	18EC56	CO1	Write Verilog programs in gate, dataflow (RTL), behavioral and switch modeling levels of Abstraction
			CO2	Designs and verify the functionality of digital circuit/system using test benches
			CO3	Identify the suitable Abstraction level for a particular digital design
			CO4	Write the programs more effectively using Verilog tasks, functions and directives
			CO5	Perform timing and delay Simulation
			CO6	Interpret the various constructs in logic synthesis
7	DIGITAL SIGNAL PROCESSING LABORATORY	18ECL57	CO1	Understand the concept of analog to digital conversion of signals and frequency domain sampling of signals
			CO2	Modeling of discrete time signals and systems and verification of its properties and results
			CO3	Implementation of discrete computations using DSP processor and verify the results
			CO4	Realize the digital filter using a simulation tool and analyze the response of the filter for an audio signal
8	HDL LABORATORY	18ECL58	CO1	Write the Verilog/VHDL programs to simulate Combinational circuits in Dataflow, Behavioral and Gate level Abstractions
			CO2	Describe sequential circuits like flip flops and counters in Behavioral description and obtain simulation waveforms
			CO3	Synthesize Combinational and Sequential circuits on programmable ICs and test the hardware
			CO4	Interface the hardware to the programmable chips and obtain the required output
8	ENVIRONMENTAL STUDIES	18CIV59	CO1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale.
			CO2	Develop critical thinking and/or observation skills and apply them to the analysis of a problem or question related to the environment
			CO3	Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components
			CO4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues

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DON BOSCO INSTITUTE OF TECHNOLOGY, BANGALORE-74
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING



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COURSE OUTCOMES

Sl. No.	SUBJECT NAME	Subject Code	Course Outcomes(CO)				
1	MICROWAVES AND ANTENNAS	17EC71	CO1	Describe the use and advantages of microwave transmission			
			CO2	Analyse various parameters related to microwave transmission lines and waveguides			
			CO3	Identify microwave devices for several applications			
			CO4	Analyse various antenna parameters necessary for building a RF system			
			CO5	Recommend various antenna configurations according to the applications			
2	DIGITAL IMAGE PROCESSING	17EC72	CO1	Understand image formation and the role human visual system plays in perception of gray and color image data			
			CO2	Apply image processing techniques in both the spatial and frequency (Fourier) domains			
			CO3	Design image analysis techniques in the form of image segmentation and to evaluate the methodologies for segmentation			
			CO4	Conduct independent study and analysis of Image Enhancement techniques			
3	POWER ELECTRONICS	17EC73	CO1	Describe the characteristics of different power devices and identify the various applications associated with it			
			CO2	Illustrate the working of power circuit as DC-DC converter			
			CO3	Illustrate the operation of inverter circuit and static switches			
			CO4	Determine the output response of a thyristor circuit with various triggering options			
			CO5	Determine the response of controlled rectifier with resistive and inductive loads			
4	CRYPTOGRAPHY	17EC744	CO1	Use basic cryptographic algorithms to encrypt the data			
			CO2	Generate some pseudorandom numbers required for cryptographic applications			
			CO3	Provide authentication and protection for encrypted data			
5	SATELLITE COMMUNICATION	17EC755	CO1	Describe the satellite orbits and its trajectories with the definitions of parameters associated with it			
			CO2	Describe the electronic hardware systems associated with the satellite subsystem and earth station			
			CO3	Describe the various applications of satellite with the focus on national satellite system			
			CO4	Compute the satellite link parameters under various propagation conditions with the illustration of multiple access techniques			

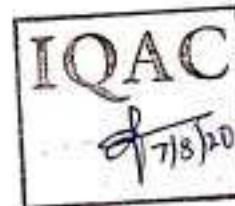
6	ADVANCED COMMUNICATION LAB	17ECL76	CO1	Determine the characteristics and response of microwave devices and optical waveguide
			CO2	Determine the characteristics of microstrip antennas and devices and compute the parameters associated with it
			CO3	Simulate the digital modulation schemes with the display of waveforms and computation of performance parameters
			CO4	Design and test the digital modulation circuits/systems and display the waveforms
6	VLSI LAB	17ECL77	CO1	Write test bench to simulate various digital circuits
			CO2	Interpret concepts of DC Analysis, AC Analysis and Transient Analysis in analog circuits
			CO3	Design and simulate basic CMOS circuits like inverter, common source amplifier and differential amplifiers
			CO4	Use basic amplifiers and further design higher level circuits like operational amplifier and analog/digital converters to meet desired parameters
			CO5	Use transistors to design gates and further using gates realize shift registers and adders to meet desired parameters

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COURSE OUTCOMES of ISE DEPARTMENT

3rd SEM-18 scheme

Sl. No	Subject Name	Subject Code		COURSE OUTCOMES(CO)
1	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES	18MAT31	CO1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.
			CO2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory
			CO3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems
			CO4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods
			CO5	Determine the extrema of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis
2	Data Structures And Applications	18CS32	CO1	Use different types of data structures, operations and algorithms
			CO2	Apply searching and sorting operations on files
			CO3	Use stack, Queue, Lists, Trees and Graphs in problem solving
			CO4	Implement all data structures in a high-level language for problem solving
3	Analog and Digital Electronic	18CS33	CO1	Design and analyze application of analog circuits using op-amps, timer IC, power supply and regulator IC and op-amp
			CO2	Explain the basic principles of A/D and D/A conversion circuits and develop the same
			CO3	Simplify digital circuits using Karnaugh Map, and Quine-McClusky Methods
			CO4	Explain Gates and flip flops and make us in designing different data processing circuits, registers and counters and compare the types
			CO5	Develop simple HDL programs
4	Computer Organization	18CS34	CO1	Explain the basic organization of a computer system
			CO2	Demonstrate functioning of different sub systems, such as processor, Input/output, and memory
			CO3	Illustrate hardwired control and micro programmed control, pipelining, embedded and other computing systems
			CO4	Design and analyse simple arithmetic and logical units

5	Software Engineering	18CS35	CO1	Design and analyse simple arithmetic and logical circuits
			CO2	Assess professional and ethical responsibility
			CO3	Function on multi-disciplinary teams
			CO4	Use the techniques, skills, and modern engineering tools necessary for engineering practice
			CO5	Analyze, design, implement, verify, validate, implement, apply, and maintain software systems or parts of software systems
6	Discrete Mathematical Structures	18CS36	CO1	Use propositional and predicate logic in knowledge representation and truth verification
			CO2	Demonstrate the application of discrete structures in different fields of computer science
			CO3	Solve problems using recurrence relations and generating functions
			CO4	Application of different mathematical proofs techniques in proving theorems in the courses
			CO5	Compare graphs, trees and their applications
7	Analog and Digital Electronic Laboratory	18CSL37	CO1	Use appropriate design equations / methods to design the given circuit
			CO2	Examine and verify the design of both analog and digital circuits using simulators
			CO3	Make use of electronic components, ICs, instruments and tools for design and testing of circuits for the given the appropriate inputs
			CO4	Compile a laboratory journal which includes, aim, tool/instruments/software/components used, design equations used and designs, schematics, program listing, procedure followed, relevant theory, results as graphs and tables, interpreting and concluding the findings.
			CO1	Analyze and Compare various linear and non-linear data structures
8	Data Structures Laboratory	18CSL38	CO2	Code, debug and demonstrate the working nature of different types of data structures and their applications
			CO3	Implement, analyze and evaluate the searching and sorting algorithms
			CO4	Choose the appropriate data structure for solving real world problems
			CO1	At the end of the course, the student will be able to understand Kannada and communicate in Kannada language
9	Aadalitha Kannad	18KAK28/39	CO1	At the end of the course, the student will be able to understand Kannada and communicate in Kannada language
10	Vyavaharika kann	18KAK28/39	CO1	At the end of the course, the student will be able to understand Kannada and communicate in Kannada language

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5TH SEM-18 scheme

SL.NO	Subject Name	Subject Code	COURSE OUTCOMES(CO)	
1	MANAGEMENT AND ENTREPRENEURSHIP FOR IT INDUSTRY	18CS51	CO1	Define management, organization, entrepreneur, planning, staffing, ERP and outline their importance in entrepreneurship
			CO2	Utilize the resources available effectively through ERP
			CO3	Make use of IPRs and institutional support in entrepreneurship
2	COMPUTER NETWORKS AND SECURITY	18CS52	CO1	Explain principles of application layer protocols
			CO2	Outline transport layer services and infer UDP and TCP protocols
			CO3	Classify routers, IP and Routing Algorithms in network layer
			CO4	Understand the Wireless and Mobile Networks covering IEEE 802.11 Standard
			CO5	Describe Multimedia Networking and Network Management
3	DATABASE MANAGEMENT SYSTEM	18CS53	CO1	Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS
			CO2	Use Structured Query Language (SQL) for database manipulation.
			CO3	Design and build simple database systems
			CO4	Develop application to interact with databases
4	AUTOMATA THEORY AND COMPUTABILITY	18CS54	CO1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation
			CO2	Learn how to translate between different models of Computation (e.g., Deterministic and Non-deterministic and Software models)
			CO3	Design Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers
			CO4	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness
			CO5	Classify a problem with respect to different models of Computation
5	APPLICATION DEVELOPMENT USING PYTHON	18CS55	CO1	Demonstrate proficiency in handling of loops and creation of functions
			CO2	Identify the methods to create and manipulate lists, tuples and dictionaries
			CO3	Discover the commonly used operations involving regular expressions and file system
			CO4	Interpret the concepts of Object-Oriented Programming as used in Python
			CO5	Determine the need for scraping websites and working with CSV, JSON and other file formats
6	UNIX PROGRAMMING	18CS56	CO1	Explain Unix Architecture, File system and use of Basic Commands
			CO2	Illustrate Shell Programming and to write Shell Scripts
			CO3	Categorize, compare and make use of Unix System Calls
			CO4	Build an application/service over a Unix system

7	COMPUTER NETWORK LABORATORY	18CSL57	CO1	Analyze and Compare various networking protocols
			CO2	Demonstrate the working of different concepts of networking
			CO3	Implement, analyze and evaluate networking protocols in NS2 / NS3 and JAVA programming language
8	DBMS LABORATORY WITH MINI PROJECT	18CSL58	CO1	Create, Update and query on the database
			CO2	Demonstrate the working of different concepts of DBMS
			CO3	Implement, analyze and evaluate the project developed for an application
9	ENVIRONMENTA L STUDIES	18CIV59	CO1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale
			CO2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment
			CO3	Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components
			CO4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues

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7TH SEM-18 scheme

SL.NO	Subject Name	Subject Code		COURSE OUTCOMES(CO)
1	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING	18CS71	CO1	Appaise the theory of Artificial intelligence and Machine Learning
			CO2	Illustrate the working of AI and ML Algorithms
			CO3	Demonstrate the applications of AI and ML
2	BIG DATA AND ANALYTICS	18CS72	CO1	Understand fundamentals of Big Data analytics
			CO2	Investigate Hadoop framework and Hadoop Distributed File system
			CO3	Illustrate the concepts of NoSQL using MongoDB and Cassandra for Big Data
			CO4	Demonstrate the MapReduce programming model to process the big data along with Hadoop tools
			CO5	Use Machine Learning algorithms for real world big data
			CO6	Analyze web contents and Social Networks to provide analytics with relevant visualization tools
3	SOFTWARE ARCHITECTURE AND DESIGN PATTERNS	18CS731	CO1	Design and implement codes with higher performance and lower complexity
			CO2	Be aware of code qualities needed to keep code flexible
			CO3	Experience core design principles and be able to assess the quality of a design with respect to these
			CO4	Capable of applying these principles in the design of object oriented systems
			CO5	Demonstrate an understanding of a range of design patterns Be capable of comprehending a design
			CO6	Be able to select and apply suitable patterns in specific contexts
4	HIGH PERFORMANCE COMPUTING	18CS732	CO1	Illustrate the key factors affecting performance of CSE applications
			CO2	Illustrate mapping of applications to high-performance computing systems
			CO3	Apply hardware/software co-design for achieving performance on real-world applications
5	ADVANCED COMPUTER ARCHITECTURE	18CS733	CO1	Explain the concepts of parallel computing and hardware technologies
			CO2	Compare and contrast the parallel architectures
			CO3	Illustrate parallel programming concepts
6	USER INTERFACE DESIGN	18CS734	CO1	Design the User Interface, design menu creation windows creation and connection between menus and windows
7	DIGITAL IMAGE PROCESSING	18CS741	CO1	Explain fundamentals of image processing
			CO2	Compare transformation algorithms
			CO3	Contrast enhancement, segmentation and compression techniques
			CO1	Analyze the issues and challenges pertaining to management of emerging network technologies such as wired/wireless networks and high-speed internets

8	NETWORK MANAGEMENT	18CS742	CO2	Apply network management standards to manage practical networks
			CO3	Formulate possible approaches for managing OSI network model
			CO3	Use on SNMP for managing the network
			CO4	Use RMON for monitoring the behavior of the network
			CO5	Identify the various components of network and formulate the scheme for the managing them
9	NATURAL LANGUAGE PROCESSING	18CS743	CO1	Analyze the natural language text
			CO2	Define the importance of natural language
			CO3	Understand the concepts Text mining
			CO4	Illustrate information retrieval techniques
10	CRYPTOGRAPHY	18CS744	CO1	Define cryptography and its principles
			CO2	Explain Cryptography algorithms
			CO3	Illustrate Public and Private key cryptography
			CO4	Explain Key management, distribution and certification
			CO5	Explain authentication protocols
			CO6	Tell about IPsec
11	ROBOTIC PROCESS AUTOMATION DESIGN AND DEVELOPMENT	18CS745	CO1	To understand Basic Programming concepts and the underlying logic/structure
			CO2	To Describe RPA, where it can be applied and how its implemented
			CO3	To Describe the different types of variables, Control Flow and data manipulation techniques
			CO4	To Understand Image, Text and Data Tables Automation
12	INTRODUCTION TO BIG DATA ANALYTICS	18CS751	CO1	Explain the importance of data and data analysis
			CO2	Interpret the probabilistic models for data
			CO3	Define hypothesis, uncertainty principle
			CO4	Evaluate regression analysis
13	PYTHON APPLICATION PROGRAMMING	18CS752	CO1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions
			CO2	Demonstrate proficiency in handling Strings and File Systems
			CO3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions
			CO4	Interpret the concepts of Object-Oriented Programming as used in Python
			CO5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python
			CO1	Identify the AI based problems

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**INTRODUCTION
TO ARTIFICIAL
INTELLIGENCE**

18CS753

CO2	Apply techniques to solve the AI problems.
CO3	Define learning and explain various learning techniques
CO4	Discuss on expert systems

15

**INTRODUCTION
TO DOT NET
FRAME WORK
FOR APPLICATION
DEVELOPMENT**

18CS754

CO1	Build applications on Visual Studio .NET platform by understanding the syntax and semantics of C#
CO2	Demonstrate Object Oriented Programming concepts in C# programming language
CO3	Design custom interfaces for applications and leverage the available built-in interfaces in building complex applications
CO4	Illustrate the use of generics and collections in C#
CO5	Compose queries to query in-memory data and define own operator behaviour

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**ARTIFICAL
INTELLIGENCE
AND MACHINE
LEARNING
LABORATORY**

18CSL76

CO1	Implement and demonstrate AI and ML algorithms
CO2	Evaluate different algorithms

17

**INTRODUCING TO
OPERATING
SYSTEMS**

18CS654

CO1	Explain the fundamentals of operating system
CO2	Comprehend process management, memory management and storage management
CO3	Familiar with various types of operating systems

18

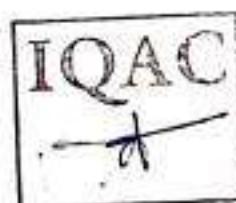
**STORAGE AREA
NETWORKS**

18CS822

CO1	Identify key challenges in managing information and analyze different storage networking technologies and virtualization
CO2	Explain components and the implementation of NAS
CO3	Describe CAS architecture and types of archives and forms of virtualization
CO4	Illustrate the storage infrastructure and management activities

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DON BOSCO INSTITUTE OF TECHNOLOGY, BANGALORE-74
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
Academic Year 2020-21



2018 SCHEME - COURSE OUTCOMES

Sl. No	Subject Name	Subject Code	2018 SCHEME – 3RD SEMESTER	
			CO No.	Course Outcomes(CO)
1	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES	18MAT31	CO1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering
			CO2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory
			CO3	Make use of Fourier transform & Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals & systems
			CO4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods
			CO5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis
2	ELECTRIC CIRCUIT ANALYSIS	18EE32	CO1	Understand the basic concepts, basic laws and methods of analysis of DC and AC networks and reduce the complexity of network using source shifting, source transformation and network reduction using transformations
			CO2	Solve complex electric circuits using network theorems
			CO3	Discuss resonance in series and parallel circuits and also the importance of initial conditions and their evaluation
			CO4	Synthesize typical waveforms using Laplace transformation
			CO5	Solve unbalanced three phase
3	TRANSFORMERS AND GENERATORS	18EE33	CO1	Understand the construction and operation of 1-phase, 3-Phase transformers and Autotransformer
			CO2	Analyze the performance of transformers by polarity test, Sumpner's Test, phase conversion, 3-phase connection, and parallel operation
			CO3	Understand the construction and working of AC and DC Generators
			CO4	Analyze the performance of the AC Generators on infinite bus and parallel operation
			CO5	Determine the regulation of AC Generator by Slip test, EMF, MMF, and ZPF Methods
4	ANALOG ELECTRONIC CIRCUITS	18EE34	CO1	Obtain the output characteristics of clipper and clamper circuits
			CO2	Design and compare biasing circuits for transistor amplifiers & explain the transistor switching
			CO3	Explain the concept of feedback, its types and design of feedback circuits
			CO4	Design and analyze the power amplifier circuits and oscillators for different frequencies
			CO5	Design and analysis of FET and MOSFET amplifiers
5	DIGITAL SYSTEM DESIGN	18EE35	CO1	Develop simplified switching equation using Karnaugh Maps and Quine McClusky techniques
			CO2	Design Multiplexer, Encoder, Decoder, Adder, Subtractors and Comparator as digital combinational control circuits
			CO3	Design flip flops, counters, shift registers as sequential control circuits
			CO4	Develop Mealy/Moore Models and state diagrams for the given clocked sequential circuits

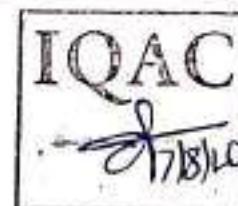
6	ELECTRICAL & ELECTRONIC MEASUREMENTS	18EE36	CO5	Explain the functioning of Read only and Read/Write Memories, Programmable ROM, EPROM and Flash memory
			CO1	Measure resistance, inductance and capacitance using bridges and determine earth resistance
			CO2	Explain the working of various meters used for measurement of Power, Energy & understand the adjustments, calibration & errors in energy meters
			CO3	Understand methods of extending the range of instruments & instrument transformers
			CO4	Explain the working of different electronic instruments
			CO5	Explain the working of different display and recording devices
7	ELECTRICAL MACHINES LABORATORY -I	18EEL37	CO1	Evaluate the performance of transformers from the test data obtained
			CO2	Connect and operate two single phase transformers of different KVA rating in parallel
			CO3	Connect single phase transformers for three phase operation and phase conversion
			CO4	Compute the voltage regulation of synchronous generator using the test data obtained in the laboratory
			CO5	Evaluate the performance of synchronous generators from the test data and assess the performance of synchronous generator connected to infinite bus
8	ELECTRONICS LABORATORY	18EEL38	CO1	Design and test rectifier circuits with and without capacitor filters
			CO2	Determine h-parameter models of transistor for all modes
			CO3	Design and test BJT and FET amplifier and oscillator circuits
			CO4	Realize Boolean expressions, adders and subtractors using gates
			CO5	Design and test Ring counter/Johnson counter, Sequence generator and 3 bit counters

2018 SCHEME – 5TH SEMESTER

SL No	Subject Name	Subject Code	Course Outcomes(CO)	
1	MANAGEMENT AND ENTREPRENEURSHIP	18EE51	CO1	Explain the field of management, task of the manager, planning and steps in decision making
			CO2	Discuss the structure of organization, importance of staffing, leadership styles, modes of communication, techniques of coordination and importance of managerial control in business
			CO3	Explain the concepts of entrepreneurship and a businessman's social responsibilities towards different groups
			CO4	Show an understanding of role of SSI's in the development of country and state/central level institutions/agencies supporting business enterprises
			CO5	techniques
2	MICROCONTROLLER	18EE52	CO1	Outline the 8051 architecture, registers, internal memory organization, addressing modes
			CO2	Discuss 8051 addressing modes, instruction set of 8051, accessing data and I/O port programming
			CO3	Develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic and arithmetic operations, data conversion and timer/counter programming
			CO4	Summarize the basics of serial communication and interrupts, also develop 8051 programs for serial data communication and interrupt programming
			CO5	Program 8051 to work with external devices for ADC, DAC, Stepper motor control, DC motor control, Elevator control
3	POWER ELECTRONICS	18EE53	CO1	To give an overview of applications power electronics, different types of power semiconductor devices, their switching characteristics, power diode characteristics, types, their operation and the effects of power diodes on RL circuits
			CO2	To explain the techniques for design and analysis of single phase diode rectifier circuits
			CO3	To explain different power transistors, their steady state and switching characteristics and limitations
			CO4	To explain different types of Thyristors, their gate characteristics and gate control requirements

No	Subject Name	Subject Code	Course Outcomes(CO)
3	POWER ELECTRONICS	18EE53	CO5 To explain the design, analysis techniques, performance parameters and characteristics of controlled rectifiers, DC-DC, DC-AC converters and Voltage controllers
4	SIGNALS AND SYSTEMS	18EE54	CO1 Explain the generation of signals, behavior of system and the basic operations that can be performed on signals and properties of systems
			CO2 Apply convolution in both continuous and discrete domain for the analysis of systems given impulse response of a system
			CO3 Solve the continuous time and discrete time systems by various methods and their representation by block diagram
			CO4 Perform Fourier analysis for continuous and discrete time, linear time invariant systems
			CO5 Apply Z-transform and properties of Z transform for the analysis of discrete time systems
5	ELECTRICAL MACHINE DESIGN	18EE55	CO1 Identify and list, limitations, modern trends in design, manufacturing of electrical machines and properties of materials used in the electrical machines
			CO2 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.
			CO3 Derive the output equations of transformer, discuss selection of specific loadings, estimate the number of cooling tubes, no load current and leakage reactance of core type transformer
			CO4 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
			CO5 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 specifications
6	HIGH VOLTAGE ENGINEERING	18EE56	CO1 Explain conduction and breakdown phenomenon in gases, liquid dielectrics and breakdown phenomenon in solid dielectrics
			CO2 Summarize generation of high voltages and currents
			CO3 Outline measurement techniques for high voltages and currents
			CO4 Summarize overvoltage phenomenon and insulation coordination in electric power systems
			CO5 Explain non-destructive testing of materials and electric apparatus, high-voltage testing of electric apparatus
7	MICROCONTROLLER LABORATORY - I	18EEL57	CO1 Write assembly language programs for data transfer, arithmetic, Boolean and logical instructions and code conversions
			CO2 Write ALP using subroutines for generation of delays, counters, configuration of SFRs for serial communication and timers
			CO3 Perform interfacing of stepper motor and dc motor for controlling the speed, elevator, LCD, external ADC and temperature control
			CO4 Generate different waveforms using DAC interface
			CO5 Work with a small team to carryout experiments using microcontroller concepts and prepare reports that present lab work
8	POWER ELECTRONICS LABORATORY	18EEL58	CO1 Obtain static characteristics of semiconductor devices to discuss their performance
			CO2 Trigger the SCR by different methods
			CO3 Verify the performance of single phase controlled full wave rectifier and AC voltage controller with R and RL loads
			CO4 Control the speed of a DC motor, universal motor and stepper motors
			CO5 Verify the performance of single phase full bridge inverter connected to resistive load

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Academic Year 2020-21



2017 SCHEME - COURSE OUTCOMES

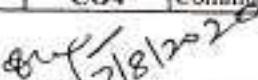
2017 SCHEME – 5TH SEMESTER			
Sl. No	Subject Name	Subject Code	Course Outcomes(CO)
1	MANAGEMENT AND ENTREPRENEURSHIP	17EE51	CO1 Explain the field of management, task of the manager, planning and the need of proper staff recruitment and selection process
			CO2 Discuss work allocation, the structure of organization, the modes of communication and importance of managerial control in business
			CO3 To explain need of coordination between the manager and staff in exercising the authority and delegating duties.
			CO4 To explain the social responsibility of business and leadership
			CO5 Explain the concepts of entrepreneurship and the role and importance of the entrepreneur in economic development.
			CO6 Show an understanding of the role and importance of Small Scale Industries, business plan and its presentation
			CO7 Discuss the concepts of project management, capital building process, project feasibility study, project appraisal and project financing
			CO8 Discuss the state /central level institutions / agencies supporting business enterprises
2	MICROCONTROLLER	17EE52	CO1 Discuss the history of the 8051 and features of other 8051 family members and the internal architecture of the 8051
			CO2 Explain the use of an 8051 assembler, the stack and the flag register, loop, jump, and call instructions
			CO3 Discuss 8051 addressing modes, accessing data and I/O port programming, arithmetic, logic instructions, and programs
			CO4 Develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic and arithmetic operations, data conversion and data serialization
			CO5 Discuss the hardware connection of the 8051 chip, its timers, serial data communication and its interfacing of 8051 to the RS232
3	POWER ELECTRONICS	17EE53	CO1 Explain application area of power electronics, types of power electronic circuits and switches their characteristics and specifications
			CO2 Explain types of power diodes, their characteristics, and the effects of power diodes on RL circuits
			CO3 Explain the techniques for design, operation and analysis of single phase diode rectifier circuits
			CO4 Explain steady state switching characteristics and gate control requirements of different power transistors and their limitations
			CO5 Discuss different types of Thyristors, their operation, gate characteristics and gate control requirements
			CO6 Explain designing, analysis techniques and characteristics of thyristor controlled rectifiers.
			CO7 Discuss the principle of operation of single phase and three phase DC - DC, DC - AC converters and AC voltage controllers
4	SIGNALS AND SYSTEMS	17EE54	CO1 Classify the signals and systems
			CO2 Explain basic operations on signals and properties of systems.
			CO3 Use convolution in both continuous and discrete domain for the analysis of systems given the impulse response of a system
			CO4 Evaluate response of a given linear time invariant system
			CO5 Provide block diagram representation of a linear time invariant system
			CO6 Apply continuous time Fourier transform representation to study signals and linear time invariant systems
			CO7 Apply discrete time Fourier transform representation to study signals and linear time invariant systems. Use Z-transform and properties of Z transform for the
5	ELECTRICAL ESTIMATION AND COSTING	17EE553	CO1 Explain the purpose of estimation and costing □
			CO2 Discuss market survey, estimates, purchase enquiries, preparation of tenders, comparative statements and payment of bills □
			CO3 Discuss Indian Electricity act and Indian Electricity rules □
			CO4 Discuss distribution of energy in a building, wiring and methods of wiring, cables used in internal wiring, wiring accessories and fittings, fuses and types of fuses
			CO5 Discuss design of lighting points and its number, total load, sub-circuits, size of conductor □

			CO6	Discuss types of service mains and estimation of service mains and power circuits
			CO7	Discuss estimation of overhead transmission and distribution system and its components
			CO8	Discuss main components of a substation, preparation of single line diagram of a substation and earthing of a substation
6	RENEWABLE ENERGY SOURCES	17EE563	CO1	Discuss causes of energy scarcity and its solution, energy resources and availability of renewable energy
			CO2	Discuss energy from sun, energy reaching the Earth's surface and solar thermal energy applications
			CO3	Discuss types of solar collectors, their configurations, solar cell system, its characteristics and their applications
			CO4	Discuss generation of energy from hydrogen, wind, geothermal system, solid waste and agriculturerefuse
			CO5	Discuss production of energy from biomass, biogas
			CO6	Discuss tidal energy resources, energy availability and power generation
			CO7	Discuss power generation sea wave energy and ocean thermal energy
7	MICROCONTROLLER LABORATORY - I	17EEL57	CO1	Write assembly language programs for data transfer, arithmetic, Boolean and logical instructions
			CO2	Write ALP for code conversions
			CO3	Write ALP using subroutines for generation of delays, counters, configuration of SFRs for serial communication and timers
			CO4	Perform interfacing of stepper motor and dc motor for controlling the speed
			CO5	Generate different waveforms using DAC interface
			CO6	Work with a small team to carryout experiments using microcontroller concepts and prepare reports that present lab work
8	POWER ELECTRONICS LABORATORY	17EEL58	CO1	Obtain static characteristics of semiconductor devices to discuss their performance
			CO2	Trigger the SCR by different methods
			CO3	Verify the performance of single phase controlled full wave rectifier and AC voltage controller with R and RL loads
			CO4	Control the speed of a dc motor, universal motor and stepper motors.
			CO5	Verify the performance of single phase full bridge inverter connected to resistive load
			CO6	Perform commutation of SCR by different methods

2017 SCHEME - 7TH SEMESTER

Sl. No	Subject Name	Subject Code		Course Outcomes(CO)
1	POWER SYSTEM ANALYSIS - 2	17EE71	CO1	Formulate network matrices and models for solving load flow problems
			CO2	Perform steady state power flow analysis of power systems using numerical iterative techniques
			CO3	Discuss optimal scheduling for hydro-thermal system, power system security and reliability
			CO4	Analyze short circuit faults in power system networks using bus impedance matrix
			CO5	Perform numerical solution of swing equation for multi-machine stability
2	POWER SYSTEM PROTECTION	17EE72	CO1	Discuss performance of protective relays, components of protection scheme and relay terminology overcurrent protection
			CO2	Explain the working of distance relays and the effects of arc resistance, power swings, line length and source impedance on performance of distance relays
			CO3	Discuss pilot protection, wire pilot relaying and carrier pilot relaying
			CO4	Discuss construction, operating principles and performance of differential relays for differential protection
			CO5	Discuss protection of generators, motors, Transformer and Bus Zone Protection
3	HIGH VOLTAGE ENGINEERING	17EE73	CO1	Explain conduction and breakdown phenomenon in gases, liquid dielectrics
			CO2	Explain breakdown phenomenon in solid dielectrics
			CO3	Explain generation of high voltages and currents

4 UTILIZATION OF ELECTRICAL POWER	17EE742	CO4	Discuss measurement techniques for high voltages and currents
		CO5	Discuss overvoltage phenomenon and insulation coordination in electric power systems.
		CO6	Discuss non-destructive testing of materials and electric apparatus and high-voltage testing of electric apparatus
		CO1	Discuss electric heating, air-conditioning and electric welding
		CO2	Explain laws of electrolysis, extraction and refining of metals and electro deposition.
		CO3	Explain the terminology of illumination, laws of illumination, construction and working of electric lamps
		CO4	Design interior and exterior lighting systems- illumination levels for factory lighting- flood lighting street lighting
		CO5	Discuss systems of electric traction, speed time curves and mechanics of train movement
		CO6	Explain the motors used for electric traction and their control
		CO7	Discuss braking of electric motors, traction systems and power supply and other traction systems
		CO8	Explain the working of electric and hybrid electric vehicles
5 TESTING AND COMMISSIONING OF POWER SYSTEM APPARATUS	17EE752	CO1	Describe the process to plan, control and implement commissioning of electrical equipment
		CO2	Differentiate the performance specifications of transformer and induction motor
		CO3	Demonstrate the routine tests for synchronous machine, induction motor, transformer & switchgears.
		CO4	Describe corrective and preventive maintenance of electrical equipment's
		CO5	Explain the operation of an electrical equipment's such as isolators, circuit breakers, induction motor and synchronous machines
6 POWER SYSTEM SIMULATION LABORATORY	17EEL76	CO1	Develop a program in MATLAB to assess the performance of medium and long transmission lines.
		CO2	Develop a program in MATLAB to obtain the power angle characteristics of salient and non-salient pole alternator
		CO3	Develop a program in MATLAB to assess the transient stability under three phase fault at different locations in a of radial power systems
		CO4	Develop programs in MATLAB to formulate bus admittance and bus impedance matrices of interconnected power systems.
		CO5	Use Mi-Power package to solve power flow problem for simple power systems
		CO6	Use Mi-Power package to study unsymmetrical faults at different locations in radial power systems
		CO7	Use of Mi-Power package to study optimal generation scheduling problems for thermal power plants
7 RELAY AND HIGH VOLTAGE LABORATORY	17EEL77	CO1	Experimentally verify the characteristics of over current, over voltage, under voltage and negative sequence relays both electromagnetic and static type
		CO2	Experimentally verify the characteristics of microprocessor based over current, over voltage, under voltage relays and distance relay
		CO3	Show knowledge of protecting generator, motor and feeders
		CO4	Analyze the spark over characteristics for both uniform and non-uniform configurations using High AC and DC voltages
		CO5	Measure high AC and DC voltages and breakdown strength of transformer oil
		CO6	Draw electric field and measure the capacitance of different electrode configuration models
		CO7	Show knowledge of generating standard lightning impulse voltage to determine efficiency, energy of impulse generator and 50% probability flashover voltage for air insulation
8 PROJECT PHASE - I AND SEMINAR	17EEP78	CO1	Demonstrate a sound technical knowledge of their selected project topic
		CO2	Undertake problem identification, formulation and solution
		CO3	Design engineering solutions to complex problems utilising a systems approach
		CO4	Communicate with engineers and the community at large in written and oral forms

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DON BOSCO INSTITUTE OF TECHNOLOGY, BANGALORE-74
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
Academic Year 2020-21



2015 SCHEME – 5TH SEMESTER

SL No	Subject Name	Subject Code	Course Outcomes(CO)
1	MANAGEMENT AND ENTREPRENEURSHIP	15EE51	CO1 Explain the field of management, task of the manager, planning and the need of proper staff, recruitment and selection process CO2 Discuss work allocation, the structure of organization, the modes of communication and importance of managerial control in business CO3 To explain need of coordination between the manager and staff in exercising the authority and delegating duties CO4 To explain the social responsibility of business and leadership CO5 Explain the concepts of entrepreneurship and the role and importance of the entrepreneur in economic development CO6 Show an understanding of the role and importance of Small Scale Industries, business plan and its presentation CO7 Discuss the concepts of project management, capital building process, project feasibility study, project appraisal and project financing CO8 Discuss the state level/national level institutions / agencies supporting business enterprises
			CO1 Discuss the history of the 8051 and features of other 8051 family member - include internal architecture of the 8051 CO2 Explain the use of an 8051 assembly, the stack and the flag register, loop, jump and call instructions CO3 Discuss 8051 addressing mode - accessing data and I/O port programming, arithmetic logic instructions, and programs CO4 Develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic and arithmetic operations, data conversion and data serialization CO5 Discuss the hardware connection of the 8051 chip, its timer's, serial data communication and its interfacing of 8051 to the RS232 CO6 Discuss in detail 8051 interrupts and writing interrupt handler programs CO7 Interface 8051 with real-world devices such as LCDs and keyboards, ADC, DAC chips and sensors CO8 Interface 8051/52 with external memories, 8255 chip to add ports and relays, optoisolators and motors
			CO1 Explain application area of power electronics, types of power electronic circuits and switches their characteristics and specifications CO2 Explain types of power diodes, their characteristics, and the effects of power diodes on RL circuits CO3 Explain the techniques for design, operation and analysis of single phase diode rectifier circuits CO4 Explain steady state switching characteristics and gate control requirements of different power transistors and their limitations CO5 Discuss different types of Thyristors, their operation, gate characteristics and gate control requirements CO6 Explain designing, analysis techniques and characteristics of three phase controlled rectifiers CO7 Discuss the principle of operation of single phase and three phase DC - DC, DC - AC converters and AC voltage controllers
			CO1 Classify the signals and systems CO2 Explain basic operations on signals and properties of systems CO3 Use convolution in both continuous and discrete domain for the analyses of systems given the impulse response of a system CO4 Evaluate response of a given linear time invariant system CO5 Provide block diagram representation of a linear time invariant system CO6 Apply continuous time Fourier transform representation to study signals and linear time invariant systems CO7 Apply discrete time Fourier transform representation to study signals and linear time invariant systems. Use Z-transform and properties of Z transform for the
			CO1 Discuss Indian Electricity Act and Indian Electricity rules [1] CO2 Discuss distribution of energy in a building, wiring and methods of wiring, cables used in internal wiring, wiring accessories and fittings, fuses and types of fuses CO3 Discuss design of lighting points and its number, total load, sub-circuits, size of conductor [1] CO4 Discuss types of service mains and estimation of service mains and power circuits [1] CO5 Discuss estimation of overhead transmission and distribution system and its components [1] CO6 Discuss main components of a substation, preparation of single line diagram of a substation and earthing of a substation CO7 Discuss estimation of overhead transmission and distribution system and its components CO8 Discuss main components of a substation, preparation of single line diagram of a substation and earthing of a substation CO1 Discuss causes of energy scarcity and its solution, energy resources and availability of renewable energy

6	RENEWABLE ENERGY SOURCES	15EE563	CO2	Discuss energy from sun, energy reaching the Earth's surface and solar thermal energy applications
			CO3	Discuss types of solar collectors, their configurations, solar cell system, its characteristics and their applications
			CO4	Discuss generation of energy from hydrogen, wind, geothermal system, solid waste and agriculture refuse
			CO5	Discuss production of energy from biomass, biogas
			CO6	Discuss tidal energy resources, energy availability and power generation
			CO7	Discuss power generation sea wave energy and ocean thermal energy
7	MICROCONTROLLER LABORATORY - I	15EEL57	CO1	Write assembly language programs for data transfer, arithmetic, Boolean and logical instructions
			CO2	Write ALP for code conversions
			CO3	Write ALP using subroutines for generation of delays, counters, configuration of SERs for serial communication and timers
			CO4	Perform interfacing of stepper motor and dc motor for controlling the speed
			CO5	Generate different waveforms using DAC interface
8	POWER ELECTRONICS LABORATORY	15EEL58	CO1	Work with a small team to carryout experiments using microcontroller concepts and prepare reports that present lab work
			CO2	Obtain static characteristics of semiconductor devices to discuss their performance
			CO3	Trigger the SCR by different methods
			CO4	Verify the performance of single phase controlled full wave rectifier and AC voltage controller with R and RL loads
			CO5	Control the speed of a dc motor, universal motor and stepper motors.
			CO6	Verify the performance of single phase full bridge inverter connected to resistive load
				Perform commutation of SCR by different methods

2015 SCHEME - 7TH SEMESTER

SL No	Subject Name	Subject Code	Course Outcomes(CO)	
1	POWER SYSTEM ANALYSIS - 2	15EE71	CO1	Formulate network matrices and models for solving load flow problems
			CO2	Perform steady state power flow analysis of power systems using numerical iterative techniques
			CO3	Suggest a method to control voltage profile
			CO4	Show knowledge of optimal operation of generators on a bus bar, optimal unit commitment, reliability considerations and optimum generation scheduling
			CO5	Discuss optimal scheduling for hydro-thermal system, power system security and reliability
			CO6	Analyze short circuit faults in power system networks using bus impedance matrix
			CO7	Perform numerical solution of swing equation for multi-machine stability
2	POWER SYSTEM PROTECTION	15EE72	CO1	Discuss performance of protective relays, components of protection scheme and relay terminology, overcurrent protection
			CO2	Explain the working of distance relays and the effects of arc resistance, power swings, line length and source impedance on performance of distance relays
			CO3	Discuss pilot protection, wire pilot relaying and carrier pilot relaying
			CO4	Discuss construction, operating principles and performance of differential relays for differential protection
			CO5	Discuss protection of generators, motors, Transformer and Bus Zone Protection
			CO6	Explain the principle of circuit interruption in different types of circuit breakers
			CO7	Describe the construction & operating principle of different types of fuses and to give the definitions of different terminologies related to a fuse
			CO8	Discuss protection against Overvoltages and Gas Insulated Substation (GIS)
3	HIGH VOLTAGE ENGINEERING	15EE73	CO1	Explain conduction and breakdown phenomena in gases, liquid dielectrics
			CO2	Explain breakdown phenomenon in solid dielectrics
			CO3	Explain generation of high voltages and currents
			CO4	Discuss measurement techniques for high voltages and currents
			CO5	Discuss over voltage phenomenon and insulation coordination in electric power systems
			CO6	Discuss non-destructive testing of materials and electric apparatus and high voltage testing of electric apparatus
			CO1	Discuss electric heating, air-conditioning and electric welding
			CO2	Explain laws of electrolysis, extraction and refining of metals and electro deposition

4	UTILIZATION OF ELECTRICAL POWER	15EE742	CO3	Explain the terminology of illumination, laws of illumination, construction and working of electric lamps
			CO4	Design interior and exterior lighting systems- illumination levels for factory lighting- flood lighting street lighting
			CO5	Discuss systems of electric traction, speed time curves and mechanics of train movement
			CO6	Explain the motors used for electric traction and their control.
			CO7	Discuss braking of electric motors, traction systems and power supply and other traction systems.
			CO8	Explain the working of electric and hybrid electric vehicles
5	TESTING AND COMMISSIONING OF POWER SYSTEM APPARATUS	15EE752	CO1	Describe the process to plan, control and implement commissioning of electrical equipment
			CO2	Differentiate the performance specifications of transformer and induction motor
			CO3	Demonstrate the routine tests for synchronous machine, induction motor, transformer & switchgears
			CO4	Describe corrective and preventive maintenance of electrical equipment's
			CO5	Explain the operation of an electrical equipment's such as isolators, circuit breakers, induction motor and synchronous machines
			CO1	Develop a program in MATLAB to assess the performance of medium and long transmission lines
6	POWER SYSTEM SIMULATION LABORATORY	15EEL76	CO2	Develop a program in MATLAB to obtain the power angle characteristics of salient and non-salient pole alternator
			CO3	Develop a program in MATLAB to assess the transient stability under three phase fault at different locations in a of radial power systems
			CO4	Develop programs in MATLAB to formulate bus admittance and bus impedance matrices of interconnected power systems
			CO5	Use Mi-Power package to solve power flow problem for simple power systems
			CO6	Use Mi-Power package to study unsymmetrical faults at different locations in radial power systems
			CO7	Use of Mi-Power package to study optimal generation scheduling problems for thermal power plants
			CO1	Experimentally verify the characteristics of over current, over voltage, under voltage and negative sequence relays both electromagnetic and static type
7	RELAY AND HIGH VOLTAGE LABORATORY	15EEL77	CO2	Experimentally verify the characteristics of microprocessor based over current, over voltage, under voltage relays and distance relay
			CO3	Show knowledge of protecting generator, motor and feeders
			CO4	Analyze the spark over characteristics for both uniform and non-uniform configurations using High AC and DC voltages
			CO5	Measure high AC and DC voltages and breakdown strength of transformer oil
			CO6	Draw electric field and measure the capacitance of different electrode configuration models
			CO7	Show knowledge of generating standard lightning impulse voltage to determine efficiency, energy of impulse generator and 50% probability flashover voltage for air insulation
			CO1	Demonstrate a sound technical knowledge of their selected project topic
8	PROJECT PHASE - I AND SEMINAR	15EEP78	CO2	Undertake problem identification, formulation and solution
			CO3	Design engineering solutions to complex problems utilizing a systems approach
			CO4	Communicate with engineers and the community at large in written an oral forms
			CO5	Demonstrate the knowledge, skills and attitudes of a professional engineer

HOD - Signature



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Don Bosco Institute of Technology, Bangalore

(NAAC Accredited Institution)

Department of Mechanical Engineering

(Accredited by NBA)



COs 2020-21 Odd Semester

2018 scheme COURSE OUTCOMES 3rd SEM			
Sl. No	Subject Name	Subject Code	Course Outcomes(CO)
1	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES	18MAT31	CO1 Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.
			CO2 Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory
			CO3 Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems
			CO4 Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods
			CO5 Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis
2	MECHANICS OF MATERIALS	18ME32	CO1 Understand simple, compound, thermal stresses and strains their relations and strain energy
			CO2 Analyse structural members for stresses, strains and deformations
			CO3 Analyse the structural members subjected to bending and shear loads.
			CO4 Analyse shafts subjected to twisting loads.
			CO5 Analyse the short columns for stability
3	BASIC THERMODYNAMICS	18ME33	CO1 Explain fundamentals of thermodynamics and evaluate energy interactions across the boundary of thermodynamic systems
			CO2 Evaluate the feasibility of cyclic and non-cyclic processes using 2nd law of thermodynamics
			CO3 Apply the knowledge of entropy, reversibility and irreversibility to solve numerical problems and apply 1st law of thermodynamics to closed and open systems and determine quantity of energy transfers and change in properties.
			CO4 Interpret the behavior of pure substances and its application in practical problems
			CO5 Recognize differences between ideal and real gases and evaluate thermodynamic properties of ideal and real gas mixtures using various relations.

SL No	Subject Name	Subject Code	Course Outcomes(CO)
4	MATERIAL SCIENCE	18ME34	CO1 Understand the mechanical properties of metals and their alloys.
			CO2 Analyze the various modes of failure and understand the microstructures of ferrous and nonferrous materials
			CO3 Describe the processes of heat treatment of various alloys
			CO4 Acquire the Knowledge of composite materials and their production process as well as
			CO5 Understand the properties and potentialities of various materials available and material selection procedures
5	METAL CUTTING AND FORMING	18ME35A	CO1 Explain the construction & specification of various machine tools.
			CO2 Analyze tool wear mechanisms and equations to enhance tool life and minimize machining cost
			CO3 Apply mechanics of machining process to evaluate machining time
			CO4 Understand the concepts of different metal forming processes
			CO5 Apply the concepts of design of sheet metal dies to design different dies for simple sheet metal components.
6	WORKSHOP AND MACHINE SHOP PRACTICE	18MEL38A	CO1 To read working drawings, understand operational symbols and execute machining operations
			CO2 Prepare fitting models according to drawings using hand tools- V-block, marking gauge, files, hack
			CO3 Understand integral parts of lathe, shaping and milling machines and various accessories and attachments used
			CO4 Select cutting parameters like cutting speed, feed, depth of cut, and tooling for various machining
			CO5 Perform cylindrical turning operations such as plain turning, taper turning, step turning, thread Cutting, facing, knurling, internal thread cutting, eccentric turning and estimate cutting time
7	COMPUTER AIDED MACHINE DRAWING	18ME36A	CO1 Identify the national and international standards pertaining to machine drawing
			CO2 Understand the importance of the linking functional and visualization aspects in the preparation of the part drawings
			CO3 Interpret the Machining and surface finish symbols on the component drawings
			CO4 Preparation of the part or assembly drawings as per the conventions.
8	MATERIAL TESTING LAB	18MEL37A	CO1 Acquire experimentation skills in the field of material testing.
			CO2 Develop theoretical understanding of the mechanical properties of materials by performing experiments
			CO3 Apply the knowledge to analyse a material failure and determine the failure inducing agent/s
			CO4 Apply the knowledge of testing methods in related areas
			CO5 Understand how to improve structure/behaviour of materials for various industrial applications

Sl. No	Subject Name	Subject Code	Course Outcomes(CO)	
Sl. No	Subject Name	Subject Code	2018 scheme COURSE OUTCOMES of 5th SEM	
1	MANAGEMENT AND ECONOMICS	18ME51	CO1	To help the students to understand the fundamental concepts and principles of management, the basic roles, skills, functions of management, various organizational structures and basic knowledge of marketing
			CO2	To impart knowledge, with respect to concepts, principles and practical applications of Economics, which govern the functioning of a firm/organization under different market conditions
2	DESIGN OF MACHINE ELEMENTS I	18ME52	CO1	To understand the various steps involved in the Design Process
			CO2	To explain the principles involved in design of machine elements, subjected to different kinds of forces, from the considerations of strength, rigidity, functional and manufacturing requirements.
			CO3	Develop the capability to design elements like shafts, couplings, welded joints, screwed joints, and power screws
			CO4	To learn to use national and international standards, standard practices, standard data, catalogs, and standard components used in design of machine elements
			CO5	To understand and interpret different failure modes and application of appropriate criteria for design of machine elements
3	DYNAMICS OF MACHINES	18ME53	CO1	To understand the force-motion relationship in components subjected to external forces and analysis
			CO2	To understand the undesirable effects of unbalances resulting from prescribed motions in mechanism
			CO3	To understand the effect of Dynamics of undesirable vibrations.
			CO4	To understand the principles in mechanisms used for speed control and stability control
			CO5	To know the concepts of modelling mechanical systems using spring, mass and damper elements
			CO6	To compute the natural and damped frequencies of free 1-DOF mechanical systems
4	TURBO MACHINES	18ME54	CO1	Understand typical design of Turbo machine, their working principle, application and thermodynamics process involved
			CO2	Study the conversion of fluid energy to mechanical energy in Turbo machine with utilization factor and degree of reaction
			CO3	Analyse various designs of steam turbine and their working principle
			CO4	Study the various designs of hydraulic turbine based on the working principle.
			CO5	Understand the various aspects in design of power absorbing machine

Sl. No	Subject Name	Subject Code	Course Outcomes(CO)
5	FLUID POWER ENGINEERING	18MEE55	CO1 To provide an insight into the capabilities of hydraulic and pneumatic fluid power
			CO2 To understand concepts and relationships surrounding force, pressure, energy and power in fluid power systems
			CO3 Exposure to build and interpret hydraulic and pneumatic circuits related to industrial applications
			CO4 To examine concepts centering on sources of hydraulic power, rotary and linear actuators.
			CO5 To familiarize with logic controls and trouble shooting
6	OPERATIONS MANAGEMENT	18ME56	CO1 To get acquainted with the basic aspects of Production Management
			CO2 The expose the students to various aspects of planning, organising and controlling operations Management.
			CO3 To understand different problem-solving methodologies and Production Management techniques
7	Fluid Mechanics and Machines Lab	18MEL57	CO1 Perform experiments to determine the coefficient of discharge of flow measuring devices
			CO2 Conduct experiments on hydraulic turbines and pumps to draw characteristics
			CO3 Test basic performance parameters of hydraulic turbines and pumps and execute the knowledge in real life situations
			CO4 Determine the energy flow pattern through the hydraulic turbines and pumps
8	ENERGY LAB	18MEL58	CO1 Perform experiments to determine the properties of fuels and oils
			CO2 Conduct experiments on engines and draw characteristics
			CO3 Test basic performance parameters of IC Engine and implement the knowledge in industry
			CO4 Identify exhaust emission, factors affecting them and report the remedies
			CO5 Determine the energy flow pattern through the IC Engine
			CO6 Exhibit his competency towards preventive maintenance of IC engines
Sl. No	Subject Name	Subject Code	2017 scheme COURSE OUTCOMES of 5th SEM
1	MANAGEMENT AND ENGINEERING ECONOMICS	17MES1	CO1 Explain the development of management and the role it plays at different levels in an organization
			CO2 Comprehend the process and role of effective planning, organizing and staffing for the development of an organization
			CO3 Understand the necessity of good leadership, communication and coordination for establishing effective control in an organization
			CO4 Understand engineering economics demand supply and its importance in economics decision making and problemsolving
			CO5 Calculate present worth, annual worth and IRR for different alternatives in economic decision making

Sl. No	Subject Name	Subject Code	Course Outcomes(CO)
2	DYNAMICS OF MACHINERY	17ME52	CO1 Determine the forces and couples for static and dynamic conditions of four bar and slider crank mechanisms to keep the system in equilibrium
			CO2 Determine magnitude and angular position of balancing masses under static and dynamic condition of rotating masses in same and different planes.
			CO3 Determine unbalanced primary, secondary forces and couples in single and multi-cylinder engine
			CO4 Determine sensitiveness, isochronism, effort and power of porter and hartnell governors
			CO5 Determine gyroscopic couple and effects related to 2, 4 wheeler, plane disc, ship and aeroplanes Understand types of vibration, SHM and methods of finding natural frequencies of simple mechanicalsystems
3	TURBO MACHINES	17ME53	Able to give precise definition of turbomachinery Identify various types of turbo machinery Apply the Euler's equation for turbomachinery to analyse energy transfer in turbomachines Understand the principle of operation of pumps, fans, compressors and turbines
			CO1 Perform the preliminary design of turbomachines (pumps, rotary compressors and turbines)
			CO2 Identify various types of turbo machinery
			CO3 Analyze the performance of turbo machinery
4	DESIGN OF MACHINE ELEMENTS - I	17ME54	CO1 Describe the design process, choose materials.
			CO2 Apply the codes and standards in design process
			CO3 Analyze the behavior of machine components under static, impact, fatigue loading using failure theories
			CO4 Design shafts, joints, couplings
			CO5 Design of riveted and welded joints. Design of threaded fasteners and power screws
5	NON TRADITIONAL MACHINING	17ME554	CO1 Understand the compare traditional and non-traditional machining processand recognize the need for Non-traditional machining process
			CO2 Understand the constructional features, performance parameters, process characteristics, applications, advantages and limitations of USM, AJM and WJM
			CO3 Identify the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process characteristics, applications, advantages and limitations
			CO4 Understand the constructional feature of the equipment, process parameters, process characteristics, applications, advantages and limitations EDM & PAM
			CO5 Understand the LBM equipment, LBM parameters, and characteristics. EBM equipment and mechanism of metal removal, applications, advantages and limitations LBM & EBM.
6	ENERGY AND ENVIRONMENT	17ME562	CO1 Summarize the basic concepts of energy, its distribution and general Scenario
			CO2 Explain different energy storage systems, energy management, audit and economic analysis
			CO3 Summarize the environment eco system and its need for awareness.
			CO4 Identify the various types of environment pollution and their effects
			CO5 Discuss the social issues of the environment with associated acts

Sl. No	Subject Name	Subject Code	Course Outcomes(CO)
7	FLUID MECHANICS & MACHINERY LAB	17MEL57	CO1 Perform experiments to determine the coefficient of discharge of flow measuring devices
			CO2 Conduct experiments on hydraulic turbines and pumps to draw characteristics
			CO3 Test basic performance parameters of hydraulic turbines and pumps and execute the knowledge in real life situations.
			CO4 Determine the energy flow pattern through the hydraulic turbines and pumps
8	ENERGY LAB	17MEL58	CO1 Perform experiments to determine the properties of fuels and oils
			CO2 Conduct experiments on engines and draw characteristics
			CO3 Test basic performance parameters of IC Engine and implement the knowledge in industry
			CO4 Identify exhaust emission, factors affecting them and report the remedies.
			CO5 Determine the energy flow pattern through the IC Engine
2017 scheme COURSE OUTCOMES of 7th SEM			

Sl. No	Subject Name	Subject Code	Course Outcomes(CO)
1	ENERGY ENGINEERING	17ME71	CO1 Understand energy scenario, energy sources and their utilization
			CO2 Learn about energy conversion methods and their analysis
			CO3 Study the principles of renewable energy conversion systems
			CO4 Understand the concept of green energy and zero energy
2	FLUID POWER SYSTEM	17ME72	CO1 To provide an insight into the capabilities of hydraulic and pneumatic fluid power
			CO2 To understand concepts and relationships surrounding force, pressure, energy and power in fluid power systems
			CO3 To examine concepts centring on sources of hydraulic power, rotary and linear actuators, distribution systems, hydraulic
			CO4 Exposure to build and interpret hydraulic and pneumatic circuits related to industrial applications
			CO5 To familiarize with logic controls and trouble shooting
3	CONTROLE ENGINEERING	17ME73	CO1 Modeling of mechanical, hydraulic, pneumatic and electrical systems
			CO2 Representation of system elements by blocks and its reduction
			CO3 Transient and steady state response analysis of a system. Frequency response analysis using bode plot.
			CO4 Frequency response analysis using polar plot.
			CO5 Different system compensators and variable characteristics of linear systems.
4	SMART MATERIALS AND MEMS	17ME745	CO1 Describe the methods of controlling vibration using smart systems and fabrication methods of MEMS
			CO2 Explain the principle concepts of Smart materials, structures, Fibre optics, ER & MR Fluids, Biomimetics and MEMS with principles of working
			CO3 Analyze the properties of smart structures, MEMS, with the applications and select suitable procedure for fabrication.
			CO4 Summarize the methods and uses of Micro fabrications, Biomimetics, types of polymers used in MEMS, Fibre optics, piezoelectric sensing and actuation

Sl. No	Subject Name	Subject Code	Course Outcomes(CO)
5	Mechatronics	17ME754	CO1 Illustrate various components of Mechatronics systems
			CO2 Assess various control systems used in automation.
			CO3 Develop mechanical, hydraulic, pneumatic and electrical control systems
6	Design Lab	17MEL76	CO1 To understand the working principles of machine elements such as Governors, Gyroscopes etc ,
			CO2 To identify forces and couples in rotating mechanical system components
			CO3 To identify vibrations in machine elements and design appropriate damping methods and to determine the critical speed of a rotating shaft
			CO4 To measure strain in various machine elements using strain gauges.
			CO5 To determine the minimum film thickness, load carrying capacity, frictional torque and pressure distribution of journal bearing
7	CIM Lab	17MEL77	CO1 Generate CNC Lathe part program for Turning, Facing, Chamfering, Grooving, Step turning, Taper turning, Circular interpolation etc
			CO2 Generate CNC Mill Part programming for Point to point motions, Line motions, Circular interpolation, Contour motion, Pocket milling- circular, rectangular, Mirror commands etc
			CO3 Use Canned Cycles for Drilling, Peck drilling, Boring, Tapping, Turning, Facing, Taper turning Thread cutting etc
			CO4 Simulate Tool Path for different Machining operations of small components using CNC Lathe & CNC Milling Machine
			CO5 Use high end CAM packages for machining complex parts, use state of art cutting tools and related cutting parameters, optimize cycle time

2015 scheme COURSE OUTCOMES 5th SEM

Sl. No	Subject Name	Subject Code	5th SEM Course Outcomes(CO)
1	MANAGEMENT AND ENGINEERING ECONOMICS	15ME51	CO1 Explain the development of management and the role it plays at different levels in an organization
			CO2 Comprehend the process and role of effective planning, organizing and staffing for the development of an organization.
			CO3 Understand the necessity of good leadership, communication and coordination for establishing effective control in an organization.
			CO4 Understand engineering economics demand supply and its importance in economics decision making and problemsolving.
			CO5 Calculate present worth, annual worth and IRR for different alternatives in economic decision making.
2	DYNAMICS OF MACHINERY	15MEL52	CO1 Determine the forces and couples for static and dynamic conditions of four bar and slider crank mechanisms to keep the system in equilibrium
			CO2 Determine magnitude and angular position of balancing masses under static and dynamic condition of rotating masses in same and different planes
			CO3 Determine unbalanced primary, secondary forces and couples in single and multi-cylinder engine
			CO4 Determine sensitiveness, isochronism, effort and power of porter and hartnell governors
			CO5 Determine gyroscopic couple and effects related to 2, 4 wheeler, plane disc, ship and

Subject Name	Subject Code	Course Outcomes(CO)
1. TURBO MACHINES	15MEL53	Able to give precise definition of turbomachinery Identify various types of turbo machinery Apply the Euler's equation for turbomachinery to analyse energy transfer in turbomachines Understand the principle of operation of pumps, fans, compressors and turbines CO1 Perform the preliminary design of turbomachines (pumps, rotary compressors and turbines) CO2 Identify various types of turbo machinery CO3 Analyze the performance of turbo machinery
		CO1 Describe the design process, choose materials CO2 Apply the codes and standards in design process CO3 Analyze the behavior of machine components under static, impact, fatigue loading using failure theories CO4 Design shafts, joints, couplings CO5 Design of riveted and welded joints. Design of threaded fasteners and power screws
		CO1 Understand the compare traditional and non-traditional machining processes and recognize the need for Non-traditional machining process CO2 Understand the constructional features, performance parameters, process characteristics, applications, advantages and limitations of USM, AJM and WJM CO3 Identify the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process characteristics, applications, advantages and limitations CO4 Understand the constructional feature of the equipment, process parameters, process characteristics, applications, advantages and limitations EDM & PAM CO5 Understand the LBM equipment, LBM parameters, and characteristics EBM equipment and mechanism of metal removal, applications, advantages and limitations LBM & EBM
		CO1 Summarize the basic concepts of energy, its distribution and general Scenario CO2 Explain different energy storage systems, energy management, audit and economic analysis CO3 Summarize the environment eco system and its need for awareness CO4 Identify the various types of environment pollution and their effects CO5 Discuss the social issues of the environment with associated acts
		CO1 Perform experiments to determine the coefficient of discharge of flow measuring devices CO2 Conduct experiments on hydraulic turbines and pumps to draw characteristics CO3 Test basic performance parameters of hydraulic turbines and pumps and execute the knowledge in real life situations CO4 Determine the energy flow pattern through the hydraulic turbines and pumps

No	Subject Name	Subject Code	Course Outcomes(CO)
8	ENERGY LAB	15MEL58	CO1 Perform experiments to determine the properties of fuels and oils
			CO2 Conduct experiments on engines and draw characteristics
			CO3 Test basic performance parameters of I C Engine and implement the knowledge in industry
			CO4 Identify exhaust emission, factors affecting them and report the remedies.
			CO5 Determine the energy flow pattern through the I C Engine
Exhibit his competency towards preventive maintenance of IC engines.			

2015 scheme COURSE OUTCOMES

7TH SEM 15 SCHEME

S.No	Subject Name	Subject Code	7TH SEM 15 SCHEME				
			CO1	CO2	CO3	CO4	CO5
1	Energy Engineering	15ME71	Summarize the basic concepts of thermal energy systems,	Summarize the basic concepts of thermal energy systems,	Understand the basic concepts of solar radiation and analyze the working of solar PV and thermal systems.	Understand principles of energy conversion from alternate sources including wind, geothermal, ocean, biomass, biogas	Understand the concepts and applications of fuel cells, thermoelectric convertor and MHD generator
			CO1	CO2	CO3	CO4	CO5
			Identify methods of energy storage for specific applications.	Identify and analyse the functional requirements of a fluid power transmission system for a given application.	Visualize how a hydraulic/pneumatic circuit will work to accomplish the function	Design an appropriate hydraulic or pneumatic circuit or combination circuit like electrohydraulics, electro-pneumatics for a given application	Select and size the different components of the circuit.
			CO1	CO2	CO3	CO4	CO5
			Develop a comprehensive circuit diagram by integrating the components selected for the given application.	Recognize control system and its types , control actions	Determine the system governing equations for physical models(Electrical, Thermal, Mechanical, Electro Mechanical)	Calculate the gain of the system using block diagram and signal flow graph	Illustrate the response of 1st and 2nd order systems
2	Fluid Power Systems	15ME72	CO1	CO2	CO3	CO4	CO5
			CO1	CO2	CO3	CO4	CO5
			CO1	CO2	CO3	CO4	CO5
			CO1	CO2	CO3	CO4	CO5
			CO1	CO2	CO3	CO4	CO5
3	Control Engineering	16ME73	CO1	CO2	CO3	CO4	CO5
			CO1	CO2	CO3	CO4	CO5
			CO1	CO2	CO3	CO4	CO5
			CO1	CO2	CO3	CO4	CO5
			CO1	CO2	CO3	CO4	CO5

No	Subject Name	Subject Code	Course Outcomes(CO)
4	Smart Materials & MEMS	15ME745	CO1 Describe the methods of controlling vibration using smart systems and fabrication methods of MEMS
			CO2 Explain the principle concepts of Smart materials, structures, Fibre optics, ER & MR Fluids, Biomimetics and MEMS with principles of working
			CO3 Analyze the properties of smart structures, MEMS, with the applications and select suitable procedure for fabrication
			CO4 Fibre optics, piezoelectric sensing and actuation
			CO5
5	Mechatronics	15ME753	CO1 Illustrate various components of Mechatronics systems.
			CO2 Assess various control systems used in automation
			CO3 Develop mechanical, hydraulic, pneumatic and electrical control systems
6	Design Lab.	15MEL76	CO1 To understand the working principles of machine elements such as Governors, Gyroscopes etc.,
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			CO4 Simulate Tool Path for different Machining operations of small components using CNC Lathe & CNC Milling Machine
			CO5 Use high end CAM packages for machining complex parts; use state of art cutting tools and related cutting parameters, optimize cycle time

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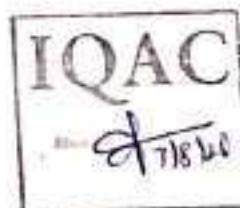
**DEPARTMENT OF CIVIL ENGINEERING****COURSE OUTCOMES****3rd SEM**

SL No	Subject Name	Subject Code		Course Outcomes(CO)
1	Transform Calculus, Fourier Series and Numerical Techniques	18MAT31	CO1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.
			CO2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory
			CO3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.
			CO4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods
			CO5	Determine the extremals of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis
2	Strength of Materials	18CV32	CO1	To evaluate the basic concepts of the stresses and strains for different materials and strength of structural elements
			CO2	To evaluate the development of internal forces and resistance mechanism for one dimensional and two dimensional structural elements
			CO3	To analyse different internal forces and stresses induced due to representative loads on structural elements
			CO4	To evaluate slope and deflections of beams
			CO5	To evaluate the behaviour of torsion members, columns and struts.
3	Fluid Mechanics	18CV33	CO1	Possess a sound knowledge of fundamental properties of fluids and fluid Continuum
			CO2	Compute and solve problems on hydrostatics, including practical applications
			CO3	Apply principles of mathematics to represent kinematic concepts related to fluid flow
			CO4	Apply fundamental laws of fluid mechanics and the Bernoulli's principle for practical applications
			CO5	Compute the discharge through pipes and over notches and weirs

Sl. No	Subject Name	Subject Code	Course Outcomes(CO)	
4	Building Materials and Construction	18CV34	CO1	Select suitable materials for buildings and adopt suitable construction techniques
			CO2	Decide suitable type of foundation based on soil parameters
			CO3	Supervise the construction of different building elements based on suitability
			CO4	Exhibit the knowledge of building finishes and form work requirements
5	Basic Surveying	18CV35	CO1	Posses a sound knowledge of fundamental principles Geodetics
			CO2	Measurement of vertical and horizontal plane, linear and angular dimensions to arrive at solutions to basic surveying problems.
			CO3	Capture geodetic data to process and perform analysis for survey problems
			CO4	Analyse the obtained spatial data and compute areas and volumes. Represent 3D data on plane figures as contours
6	Engineering Geology	18CV36	CO1	Apply geological knowledge in different civil engineering practice
			CO2	Students will acquire knowledge on durability and competence of foundation rocks, and confidence enough to use the best building materials
			CO3	Civil Engineers are competent enough for the safety, stability, economy and life of the structures that they construct
			CO4	Able to solve various issues related to ground water exploration, build up dams, bridges, tunnels which are often confronted with ground water problems
			CO5	Intelligent enough to apply GIS, GPS and remote sensing as a latest tool in different civil engineering construction
7	Computer Aided Building Planning & Drawing	18CVL37	CO1	Prepare, read and interpret the drawings in a professional set up
			CO2	Know the procedures of submission of drawings and Develop working and submission drawings for building
			CO3	Plan and design a residential or public building as per the given requirements
8	Building Materials Testing Laboratory	18CVL38	CO1	Reproduce the basic knowledge of mathematics and engineering in finding the strength in tension, compression, shear and torsion
			CO2	Identify, formulate and solve engineering problems of structural elements subjected to flexure,
			CO3	Evaluate the impact of engineering solutions on the society and also will be aware of contemporary issues regarding failure of structures due to unsuitable materials

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DEPARTMENT OF CIVIL ENGINEERING

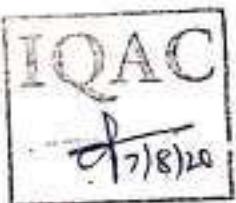
COURSE OUTCOMES

SL No	Subject Name	Subject Code	Course Outcomes(CO)	
1	CONSTRUCTION MANAGEMENT AND ENTREPRENEURSHIP	18CV51	CO1	Prepare a project plan based on requirements and prepare schedule of a project by understanding the activities and their sequence.
			CO2	Understand labour output, equipment efficiency to allocate resources required for an activity / project to achieve desired quality and safety.
			CO3	Analyze the economics of alternatives and evaluate benefits and profits of a construction activity based on monetary value and time value.
			CO4	Owns professional and ethical responsibility
2	ANALYSIS OF INDETERMINATE STRUCTURES	18CV52	CO1	Determine the moment in indeterminate beams and frames having variable moment of inertia and subsidence using slope deflection method
			CO2	Determine the moment in indeterminate beams and frames of no sway and sway using moment distribution method
			CO3	Construct the bending moment diagram for beams and frames by Kani's method
			CO4	Construct the bending moment diagram for beams and frames using flexibility method
			CO5	Analyze the beams and indeterminate frames by system stiffness method
3	DESIGN OF RC STRUCTURAL ELEMENTS	18CV53	CO1	Understand the design philosophy and principles
			CO2	Solve engineering problems of RC elements subjected to flexure, shear and torsion
			CO3	Demonstrate the procedural knowledge in designs of RC structural elements such as slabs, columns and footings
			CO4	Owns professional and ethical responsibility.
4	APPLIED GEOTECHNICAL ENGINEERING	18CV54	CO1	Ability to plan and execute geotechnical site investigation program for different civil engineering projects
			CO2	Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
			CO3	Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
			CO4	Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
			CO5	Capable of estimating load carrying capacity of single and group of piles
5	MUNICIPAL WASTEWATER ENGINEERING	18CV55	CO1	Select the appropriate sewer appurtenances and materials in sewer network
			CO2	Design the sewers network and understand the self purification process in flowing water
			CO3	Design the various physico-chemical treatment units
			CO4	Design the various biological treatment units
			CO5	Design various AOPs and low cost treatment units.

SL. No	Subject Name	Subject Code		Course Outcomes(CO)
6	HIGHWAY ENGINEERING	18CV56	CO1	Acquire the capability of proposing a new alignment or re-alignment of existing roads, conduct necessary field investigation for generation of required data.
			CO2	Evaluate the engineering properties of the materials and suggest the suitability of the same for pavement construction.
			CO3	Design road geometrics, structural components of pavement and drainage
			CO4	Evaluate the highway economics by few select methods and also will have a basic knowledge of various highway financing concepts.
7	SURVEYING PRACTICE	18CV157	CO1	Apply the basic principles of engineering surveying and for linear and angular measurements
			CO2	Comprehend effectively field procedures required for a professional surveyor.
			CO3	Use techniques, skills and conventional surveying instruments necessary for engineering practice.
8	CONCRETE AND HIGHWAY MATERIALS LABORATORY	18CVL58	CO1	Able to interpret the experimental results of concrete and highway materials based on laboratory tests.
			CO2	Determine the quality and suitability of cement
			CO3	Design appropriate concrete mix Using Professional codes.
			CO4	Determine strength and quality of concrete
			CO5	Evaluate the strength of structural elements using NDT techniques.
			CO6	Test the soil for its suitability as sub grade soil for pavements.

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COURSE OUTCOMES

7TH SEM

Sl. No	Subject Name	Subject Code	Course Outcomes(CO)	
1	Municipal and Industrial Waste Water Engineering	15CV71	CO1	Acquires capability to design sewer and Sewerage treatment plant.
			CO2	Evaluate degree of treatment and type of treatment for disposal, reuse and recycle.
			CO3	Identify waste streams and design the industrial waste water treatment plant.
			CO4	Manage sewage and industrial effluent issues.
2	Design of RCC and Steel Structures	15CV72	CO1	Students will acquire the basic knowledge in design of RCC and Steel Structures.
			CO2	Students will have the ability to follow design procedures as per codal provisions and skills to arrive at structurally safe RC and Steel members.
3	Hydrology and Irrigation Engineering	15CV73	CO1	Understand the importance of hydrology and its components.
			CO2	Measure precipitation and analyze the data and analyze the losses in precipitation.
			CO3	Estimate runoff and develop unit hydrographs
			CO4	Find the benefits and ill-effects of irrigation
			CO5	Find the quantity of irrigation water and frequency of irrigation for various crops
			CO6	Find the canal capacity, design the canal and compute the reservoir capacity
4	Ground Water & Hydraulics	15CV742	CO1	Find the characteristics of aquifers.
			CO2	Estimate the quantity of ground water by various methods.
			CO3	Locate the zones of ground water resources.
			CO4	Select particular type of well and augment the ground water storage.

5	Rehabilitation and Retrofitting of Structures	15CV753	CO1	Understand the cause of deterioration of concrete structures.
			CO2	Able to assess the damage for different type of structures
			CO3	Summarize the principles of repair and rehabilitation of structures
			CO4	Illustrate the storage infrastructure and management activities
6	Computer Aided Detailing of Structures	15CVL76	CO1	Acquire capability to conduct experiments and estimate the concentration of different parameters
			CO2	Compare the result with standards and discuss based on the purpose of analysis
			CO3	Determine type of treatment, degree of treatment for water and waste water.
			CO4	Identify the parameter to be analyzed for the student project work in environmental stream.

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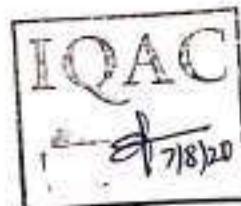
COURSE OUTCOMES

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			CO3	Estimate runoff and develop unit hydrographs
			CO4	Find the benefits and ill-effects of irrigation
			CO5	Find the quantity of irrigation water and frequency of irrigation for various crops
			CO6	Find the canal capacity, design the canal and compute the reservoir capacity
4	DESIGN OF BRIDGES	17CV74I	CO1	Understand the load distribution and IRC standards.
			CO2	Design the slab and T beam bridges
			CO3	Locate the zones of ground water resources.
			CO4	Select particular type of well and augment the ground water storage.
			CO5	Design Piers and abutments.

Sl. No	Subject Name	Subject Code		Course Outcomes(CO)
5	URBAN TRANSPORTATION AND PLANNING	17CV751	CO1	Design, conduct and administer surveys to provide the data required for transportation planning.
			CO2	supervise the process of data collection about travel behavior and analyze the data for use in transport planning
			CO3	Develop and calibrate modal split, trip generation rates for specific types of land use developments.
			CO4	Adopt the steps that are necessary to complete a long-term transportation plan.
6	ENVIRONMENTAL ENGINEERING LABORATORY	17CVL76	CO1	Acquire capability to conduct experiments and estimate the concentration of different parameters.
			CO2	Compare the result with standards and discuss based on the purpose of analysis.
			CO3	Determine type of treatment, degree of treatment for water and waste water.
			CO4	Identify the parameter to be analyzed for the student project work in environmental stream.
7	Computer Aided Detailing of Structures	17CVL77	CO1	Prepare detailed working drawings

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 Department of Management Studies and Research

COURSE OUTCOMES (2020-21)

1st SEM 2020 SCHEME

SL No	Subject Name	Subject Code	Course Outcomes(CO)	
1	Management and Organisational Behaviour	20MBA11	CO1	Gain practical experience in the field of Management and Organization Behaviour
			CO2	Acquire the conceptual knowledge of Management, various functions of Management and theories in OB
			CO3	Apply managerial and behaviour knowledge in real world situations.
			CO4	Develop a greater understanding about Management and Behavioural aspects to analyse the concepts related to individual behavior, attitude, perception and personality
			CO5	Understand and demonstrate their exposure on recent trends in management
2	Managerial Economics	20MBA12	CO1	The student will understand the application of Economic Principles in Management decision making.
			CO2	The student will learn the macro economic concepts and apply them for effective functioning of a Firm and Industry
			CO3	The Student will be able to understand, assess and forecast Demand.
			CO4	The student will apply the concepts of production and cost for optimization of production
			CO5	The student will design competitive strategies like pricing, product differentiation etc. and marketing according to the market structure and understand macroeconomics concepts.
3	Accounting for Managers	20MBA13	CO1	Demonstrate theoretical knowledge and its application in real time accounting
			CO2	Capable of preparing financial statement of companies
			CO3	Independently undertake financial statement analysis and take decisions
			CO4	Comprehend emerging trends in accounting and computerization of Accounting systems
4	Business Statistics	20MBA14	CO1	Facilitate objective situations in business decision making under subjective conditions.
			CO2	Demonstrate different statistical techniques in business real-life situations
			CO3	Understand the importance of probability in decision making
			CO4	Understand the need and application of analytics
			CO5	Understand and apply various data analysis functions for business problems
5	Marketing Management	20MBA15	CO1	Develop an ability to assess the impact of the environment on marketing function
			CO2	To formulate marketing strategies that incorporate psychological and sociological factors which influence buying
			CO3	Understanding the concept of branding and development of product, significance of market segmentation
			CO4	Identifying marketing channels and the concept of product distribution
			CO5	Identifying techniques of sales promotion - significance of marketing research
			CO6	Synthesizing ideas into a viable marketing plan for various modes of marketing
6	Managerial Communication	20MBA16	CO1	The students will be aware of their communication skills and know their potential to become successful managers
			CO2	The students will get exposed with the mechanics of writing and can compose the business letters in English precisely and effectively
			CO3	Students will get exposure in drafting business proposals to meet the challenges of competitive environment
			CO4	The students will be introduced to the managerial communication practices in business that are in vogue
			CO5	Students will get trained in the art of interpersonal communication and technological advancement and social

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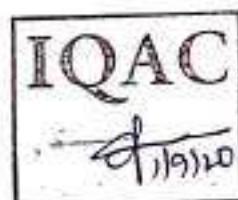
Department of Management Studies and Research

COURSE OUTCOMES (2020-21)

Sl. No	Subject Name	Subject Code	III SEM- 1B SCHEME		
					Course Outcomes(CO)
1	Customer behaviour	18MBA1M301	CO1	Explain the background and concepts vital for understanding Consumer Behaviour.	
			CO2	Identify the role of variables that determines Consumer Behaviour in Social & cultural domain.	
			CO3	Identifying the psychological and behavioural practices adopted by organizations to enhance the Consumer Behaviour.	
2	Retail Management	18MBA1M302	CO1	Find out the contemporary retail management, trends and strategies.	
			CO2	Evaluate the recent trends in retailing and its impact in the success of Modern business.	
			CO3	Relate store management and visual merchandising practices for effective retailing.	
3	Services Marketing	18MBA1M303	CO1	Develop an understanding about the various concepts and importance of Services Marketing.	
			CO2	Enhance knowledge about emerging issues and trends in the service sector.	
			CO3	Learn to implement service strategies to meet new challenges.	
4	Marketing Research & Analytics	18MBA1M304	CO1	Comprehend the objectives of Market research & its application in solving marketing problems.	
			CO2	Appreciate the use of different data collection methods, sampling design techniques, measurement methods to analyze the data.	
			CO3	Generate and interpret the data with the help of various measurement techniques.	
			CO4	To understand the emergence of new trends in research.	
5	Business Marketing	18MBA1M305	CO1	Describe the nature of business markets and the related concepts.	
			CO2	Familiarize the business buying behaviour of industrial customers.	
			CO3	Analyze business situations in the context of buyer-seller relationships.	
			CO4	Apply concepts of pricing strategies for industrial goods.	
			CO5	To evaluate the significance of E-Commerce in Business Marketing.	
6	Supply Chain Management	18MBA1M306	CO1	Demonstrate knowledge of the functions of logistics and supply chain management.	
			CO2	To relate concepts and activities of the supply chain to small organizations.	
			CO3	Highlight the role of technology in logistics and supply chain management.	
			CO4	Evaluate cases for effective supply chain management and its implementation.	
7	Banking and Financial services	1851BAFM301	CO1	The Student will be acquainted to various Banking and Nonbanking financial services in India.	
			CO2	The Student will understand the activities of Merchant Banking and credit rating.	
			CO3	The Student will be equipped to understand micro-financing and other financial services in India.	
			CO4	The Student will understand how to evaluate and compare leasing & hire purchase.	
8	Investment Management	1851BAFM302	CO1	The student will understand the capital market and various Instruments for Investment.	
			CO2	The learner will be able to assess the risk and return associated with investments and methods to value securities.	
			CO3	The student will be able to analyse the Economic, Industry and Company framework for Investment Management.	
			CO4	The student will learn the theories of Portfolio management and also the tools and techniques for efficient portfolio management.	
9	Direct Taxation	1851BAFM303	CO1	Understand the basics of taxation and process of computing residential status.	
			CO2	Calculate taxable income under different heads.	
			CO3	Understand deductions and calculation of tax liability of individuals.	
			CO4	Know the corporate tax system.	
10	Advanced Financial Management	1851BAFM304	CO1	Get an overview of capital structure theories.	
			CO2	Understand and assess the dividend policies of the firm.	
			CO3	Realize the importance of management of working capital in an organization.	
			CO4	Be aware of the techniques of cash, inventory and receivables management.	
11	Cost Management	1851BAFM305	CO1	Understand various cost methods and techniques with their features, merits and demerits.	
			CO2	Demonstrate the application of cost sheet, marginal costing budgetary control techniques, Activity based costing etc. with	
			CO3	Analyse the results after applying various costing methods and techniques.	
			CO4	Critically evaluate all traditional and non-traditional costing methods such as absorption costing, marginal costing and activity-based costing.	
12	Project Appraisal, Planning and control	1851BAFM306	CO1	Students would learn capital budgeting and project financing.	
			CO2	Students would be equipped to appraise a project.	
			CO3	Students would learn to prepare a business plan.	

			C04 To understand various financial and technical aspects of project management.
13	Recruitment and Selection	18MBAHR301	C01 Gain the insights of various principles and practices of recruitment and selection in an industry. C02 Equip students with various selection procedure practiced in industry C03 Develop students with latest selection tools in the corporate sector C04 Develop students with various testing of job recruitment and selection
14	HR Analytics	18MBAHR302	C01 Have an understanding of how HR function adds value and demonstrates the value in business firms. C02 Measure the value of intangibles that HR can build for the organization given a particular business context to facilitate decision making C03 Convert soft factors in a people management context into measurable variables across various domains. C04 Devise, conduct and analyse a study on employees or any other related to the HR context in an organization.
15	Compensation and Reward Management	18MBAHR303	C01 Gain insights of various conceptual aspects of Compensation and Benefits to achieve organizational goals C02 Determine the performance based compensation system for business excellence and solve various cases. C03 Designing the compensation strategies for attraction, motivation and retaining high quality workforce. C04 Understand the Legal & Administrative issues in global compensation to prepare compensation plan, CTC, wage survey and calculate various allowances.
16	Learning and Development	18MBAHR304	C01 Understand the concepts of learning and development and its role C02 Learn various contemporary methods of learning and development C03 Gain insights of various training evaluation methods and career planning. C04 Develop students with career management systems
17	Industrial relations and legislations	18MBAHR305	C01 Gain the insights of IR concepts and practices to design programs for better industrial relations and peace. C02 Develop the knowledge related to employee-management relations and demonstrate it in solving human resource issues. C03 Enhance necessary critical thinking skills in order to evaluate different labour laws for harmonious employee – management relations. C04 Implementation of various industrial acts to an industry working.
18	Conflict and Negotiation Management	18MBAHR306	C01 Understand the concepts of conflict and negotiation and its role C02 Learn various contemporary methods of conflict and negotiation. C03 Gain insights of various conflict handling mechanisms. C04 Demonstrate the cross-cultural and gender dimensions of negotiation.

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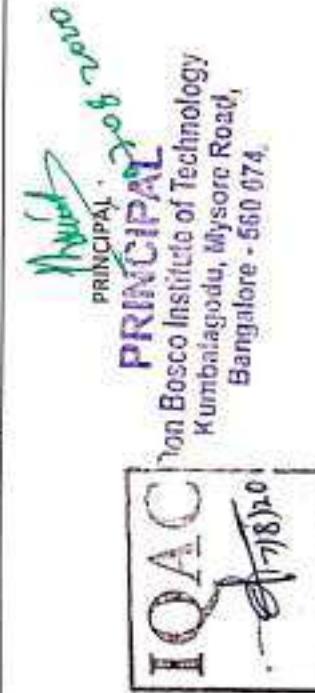


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DON BOSCO INSTITUTE OF TECHNOLOGY, BANGALORE
DEPARTMENT OF TELE COMMUNICATION ENGINEERING
 Course Outcomes AM 2020-21 (ODIB, Semester I)



3rd SEM (2018 scheme)			
Sl. No.	Subject Name	Subject Code	Course Outcomes(CO)
1	Transform Calculus, Fourier series and Numerical Techniques	18MAT131	CO1 1 Use Laplace transform and inverse Laplace transform in solving differential integral equation using in network analysis, control systems and other fields of engineering CO2 2 Demonstrate Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing and field theory CO3 3 Make use of Fourier transform and Z-transform to illustrate discrete-time signals CO4 4 Solve first and second order ordinary differential equations arising in engineering problems using simple step and modified numerical methods CO5 5 Determine the extrema of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis
2	Norton's Theory	18ECE32	CO1 1 Determine currents and voltages using source transformation/ source shunting/ mesh/ nodal analysis and reduce given CO2 2 Solve network problems by applying Superposition/ Reciprocity/ Thevenin's/Norton's/ Maximum Power Transfer/Millman's Network Theorems and electrical laws to reduce circuit complexities and to arrive at feasible solutions
3	Electronic Devices	18ECE33	CO3 3 Calculate current and voltages for the given circuit under transient conditions CO4 4 Apply Laplace transform to solve the given network CO5 5 Solve the given network using specified two port network parameter like Z or Y or T or h and CO6 6 Understand the concept of resonance
4	Digital system design	18ECE34	CO1 1 Understand the principles of semiconductor Physics CO2 2 Analyze the Majority system, speed, size and cost. Demonstrate Computer Types, Functional Units and Basic Understanding the properties and characteristics of different types of semiconductor devices
5	Computer organization and architecture	18ECE35	CO3 3 Understand the fabrication process of semiconductor junctions and MOS transistors for circuits and CO4 systems CO1 1 Explain the concept of combinational and sequential logic circuits CO2 2 Design the combinational logic circuits CO3 3 Design the sequential circuits using SR, JK, D, T flip-flops and Mealy & Moore machines CO4 4 Design applications of Combinational & Sequential Circuits CO1 1 Explain the basic organization of a computer System CO2 2 Explain different ways of accessing an input / output device including interrupts CO3 3 Illustrate the organization of different types of semiconductor and other secondary storage CO4 4 Illustrate simple processor organization based on hardware control and micro programmed control
6	Power Electronics and Instrumentation	18ECE36	CO1 1 Build and test circuits using power electronic devices CO2 2 Analyze and design controlled rectifier, DC to DC converters, DC to AC inverters and SMPS CO3 3 Define instrument errors CO4 4 Develop circuits for multirange Ammeters, Voltmeters and Bridges to measure passive component
7	Electronics devices and instrumentation Laboratory	18ECL37	CO5 5 Describe the principle of operation of Digital instruments and PLCs physical parameters CO6 6 Use instrumentation amplifier for measuring CO1 1 Understand the characteristics of various electronic devices and measurement of parameters using logcates CO2 2 Design and test simple electronic circuits CO3 3 Use of circuit simulation software for the implementation and characterization of electronic circuits and devices CO4 4 Demonstrate the truth table of various expressions and combinational circuits using logcates
8	Digital system design Laboratory	18ECL38	CO1 1 Use Laplace transform and inverse Laplace transform in solving differential integral equation using in network analysis, control systems and other fields of engineering CO2 2 Design various combinational circuits such as adders, subtractors, comparators, multipliers and demultiplexers CO3 3 Construct flip-flops, counters and shift registers CO4 4 Simulate Serial adder and Unary Multiplier



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DON BOSCO INSTITUTE OF TECHNOLOGY, BANGALORE
DEPARTMENT OF TELE COMMUNICATION ENGINEERING
 Course Outcomes A3: 2020-21 (ODD Semester)

5th SEM (18 Scheme)

Sl No	Subject Name	Subject Code	Course Outcomes (CO)
1	Technological innovation management and entrepreneurship	18ECS51	<p>CO1 1. Under Stand the basic concepts of management and entrepreneurship and opportunities CO2 2. Identify various organization architecture</p> <p>CO3 3. Describe the functions of managers, Entrepreneurs and their social responsibilities</p> <p>CO4 4. Understand the components in develop business plan</p> <p>CO5 5. Recognize various sources of funding institution supporting entrepreneurs</p>
2	Digital signal processing	18ECS52	<p>CO1 1. Determine response of LTI systems using time domain and DFT techniques</p> <p>CO2 2. Compute DFT of real and complex discrete time signals</p> <p>CO3 3. Compute DFT using FFT algorithms and short filtering approach</p> <p>CO4 4. Design and realize FIR and IIR digital filters.</p> <p>CO5 5. Understand DSP processor architecture</p>
3	Principles of communication systems	18ECS53	<p>CO1 1. Analyze and compute the performance of AM and FM modulation in the presence of noise at the receiver</p> <p>CO2 2. Analyze and compare performance of digital formatting processes with quantization noise</p> <p>CO3 3. Multiplex digitally formatted signals at transmitter</p> <p>CO4 4. Demultiplex and reconstruct digitally signals at the receiver</p> <p>CO5 5. Demonstrate the use of digital formatting in multiplexers, switches and video transmission</p>
4	Information theory and coding	18ECS54	<p>CO1 1. Explain the concept of dependent and independent source measure of information, entropy, rate of information and entropy of a source</p> <p>CO2 2. Present the information using shannon encoding, shannon fano, prefix, huffman encoding algorithms</p> <p>CO3 3. Model the continuous and discrete communication channels using input, output and joint probability mass functions</p> <p>CO4 4. Determine a codeword comprising of the check bits computed using linear block codes, cyclic codes, convolutional codes, BCH and galois codes</p> <p>CO5 5. Design the encoding and decoding circuits for linear block codes, cyclic codes, convolutional codes, BCH and galois codes</p>
5	Electromagnetic waves	18ECS55	<p>CO1 1. Evaluate problems of electrostatic force, electric field due to point, linear, volume charges by applying conventional methods and charges in a volume</p> <p>CO2 2. Apply gauss law to evaluate electric fields due to different charge distributions and volume charge distribution by using divergence theorem</p> <p>CO3 3. Determine potential and energy with respect to point charge and capacitance using laplace equation and apply bioc-savant's and ampere's law for evaluating magnetic field for different current configuration</p> <p>CO4 4. Calculate magnetic force, potential energy and magnetization with respect to magnetic materials and voltage induced in electric circuit</p> <p>CO5 5. Apply Maxwell's equation for time varying fields, EM wave in free space and conductors and evaluate power associated with EM waves using poingy theorem</p>
6	Venilog HDL	18ECS56	<p>CO1 1. Write Verilog programs in gate, dataflow, behavioral and switch modeling levels of abstraction</p> <p>CO2 2. Design and verify the functionality of digital circuit systems using test bench</p> <p>CO3 2. Identify gate level abstraction level for a particular digital design</p> <p>CO4 4. Write the programs more effectively using venilog tasks, functions and directives</p> <p>CO5 5. Perform timing and delay simulation and interpret the various constructs in logical synthesis</p>
7	DSP Lab	18ECL57	<p>CO1 1. Understand the concepts of analog to digital conversion of signals and frequency domain sampling of signals</p> <p>CO2 2. Model the discrete time signals and systems and verify its properties and results</p> <p>CO3 3. Implement discrete computation using DSP processor and verify results</p> <p>CO4 4. Realize the digital filters using a simulation tool and analyze the response of the filter for an audio signal</p> <p>CO5 5. Write programs using Matlab/simulink to illustrate DSP concepts</p>
8	EDL Lab	18ECL58	<p>CO1 1. Write verilog/VHDL programs to simulate combinational circuits in dataflow, behavioral and structural waveform</p> <p>CO2 2. Describe sequential circuits like flip flop and counters in behavioral description and obtain simulation waveform</p> <p>CO3 3. Use FPGA/V CPLD kits for downloading verilog codes and check output</p> <p>CO4 4. Synthesize combinational and sequential circuits on programmable IC's and test and hardware</p> <p>CO5 5. Interface the hardware to the programmable chips and obtain the required output</p>

5th SEM (17 Scheme)

				Course Outcomes (CO)
1	Assignment And Interpretation	17ESS1	Subject Name: Subject Code:	CO1 1. Understand the fundamental concepts of Management and Entrepreneurship CO2 2. Select a best entrepreneurship model for the required domain of establishment CO3 3. Describe the functions of Managers, Entrepreneurs and their social responsibilities CO4 4. Compare various types of Entrepreneurs, Analyze the institutional support by various state and central government agencies
2	DIGITAL SIGNAL PROCESSING	17ECS42	Subject Name: Subject Code:	CO1 1. Determine response of LTI systems using time domain and DFT techniques CO2 2. Compute DFT of real and complex discrete time signals CO3 3. Designation of DFT using FFT algorithms and linear filtering approach CO4 4. Solve problems on digital filter design and filter using digital computations
3	VERILOG HDL	17ECS33	Subject Name: Subject Code:	CO1 1. Write Verilog programs in gate, stateflow(BTL), behavioral and switch modeling levels of Abstraction CO2 2. Write simple programs in VHDL in different styles CO3 3. Design and verify the functionality of digital circuit/system using test benches CO4 4. Identify the suitable Abstraction level for a particular digital design CO5 5. Write the programs more effectively using Verilog tasks and directives CO6 6. Perform timing and delay Simulation
4	INFORMATION THEORY CONCEPT	17ECS4	Subject Name: Subject Code:	CO1 1. Explain concept of Dependent & Independent Source, measure of information, Entropy, Rate of Information and Order of a source CO2 2. Represent the information using Shannon Encoding, Shannon Fano, Prefix and Huffman Encoding Algorithms CO3 3. Model the continuous and discrete communication channels using input, output and joint probabilities CO4 4. Determine a codeword comprising of the check bits composed using Linear Block codes, cyclic codes, convolutional codes & convolutional codes CO5 5. Design the encoding and decoding circuit for Linear Block codes, cyclic codes, convolutional codes, BCH and Golay codes
5	OPERATING SYSTEM	17ECS33	Subject Name: Subject Code:	CO1 1. Explain the goals, structure, operation and types of operating systems CO2 2. Apply scheduling techniques to find performance factors CO3 3. Explain organization of file systems and LOC'S CO4 4. Apply suitable techniques for contingencies and non contiguous memory allocation CO5 5. Describe message passing, deadlock detection and prevention methods
6	MICROCONTROLLER ROLLERS	8051	Subject Name: Subject Code:	CO1 1. Explain the difference between Microprocessors & Microcontrollers, Architecture of 8051 Microcontroller, Interfacing ,memory and instruction set of 8051 CO2 2. Write 8051 Assembly level programs using 8051 instruction set. CO3 3. Explain the interrupt system, operation of Timers/Counters and Serial port of 8051 CO4 4. Write 8051 Assembly language program to generate tones and waveforms using 8051 timer, CO5 5. Write 8051 C programs to generate square wave on 8051 I/O port pin using interrupt and to send & receive serial data using 8051 serial port CO6 6. Interface simple switches, sample LEDs, ADC 0804, LCD and Stepper Motor so 8051 using 8051 I/O ports CO7 7. Understand the concepts of analog to digital conversion of signals and frequency domain sampling of signals
7	DSP LAB	17ECL57	Subject Name: Subject Code:	CO2 2. Modelling of discrete time signals and systems and verification of its properties and results CO3 3. Implementation of discrete computations using DSP processor and verify the results CO4 4. Realize the digital filters using a simulation tool and a DSP processor and verify the frequency and phase response
8	HDL LAB	17ECL58	Subject Name: Subject Code:	CO1 1. Write the Verilog/VHDL programs to simulate Combinational circuits in Dataflow, Behavioral and Gate Level Abstractions CO2 2. Describe sequential circuits like flip flops and counters in Behavioral description and obtain simulation waveforms CO3 3. Synthesize Combinational and Sequential circuits on programmable IC's and test the hardware CO4 4. Interface the hardware to the programmable chips and obtain the required output

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5th SEM(Scheme)

	Subject Name	Subject Code	COs	Learning Outcomes (COs)
1	Management and Entrepreneurship	15EN551	CO1 CO2 CO3 CO4	1. Understand the fundamental concepts of Management and Entrepreneurship 2. Select a local FDI entrepreneurship model for the required domain of establishment 3. Describe the functions of Managers, Entrepreneurs and their social responsibilities 4. Compare various types of Entrepreneurs, Analyze the Institutional support by various state and central government agencies
2	DIGITAL SIGNAL PROCESSING	15PS52	CO1 CO2 CO3 CO4	1. Determine response of LTI systems using time domain and DFT techniques 2. Compute DFT of real and complex discrete time signals 3. Computation of DFT using FFT algorithms and linear filtering approach 4. Solve problems on digital filter design and realize using digital computers
3	VERIFICATION	15VLS3	CO1 CO2 CO3 CO4	1. Write Verilog programs in gate, stateflow (UML), behavioral and switch modeling levels of Abstraction 2. Write simple programs in VHDL in different styles 3. Design and verify the functionality of digital circuit system using test benches 4. Implements the suitable Abstraction level for a particular digital design 5. Write the programs more effectively using Verilog tasks and directives 6. Perform timing and delay Simulation
4	INFORMATION THEORY CODING	15EC54	CO1 CO2 CO3 CO4 CO5	1. Explain concept of Dependent & Independent Source, measure of Information Entropy, Rate of information and Order of a source 2. Represent the information using Shannon Encoding, Shannon Fano, Prefix and Huffman Encoding Algorithms 3. Model the continuous and discrete communication channels using input, output and joint probabilities 4. Determine a codeword comprising of the check bits computed using Linear Block codes, cyclic codes & convolutional codes 5. Design the encoding and decoding circuits for Linear Block codes, cyclic codes, cumulative codes, BCH and Golay codes
5	OPERATING SYSTEM	15EC553	CO1 CO2 CO3 CO4 CO5	CO1 CO2 CO3 CO4 CO5 1. Explain the goals, structure, operation and types of operating systems 2. Apply scheduling techniques to find performance factors 3. Explain organization of file systems and I/O's 4. Apply suitable techniques for connections and non-contiguous memory allocation 5. Describe interrupt passing, deadlock detection and prevention methods
6	MICROCONT ROLLERS	1091	CO1 CO2 CO3 CO4 CO5	CO1 CO2 CO3 CO4 CO5 1. Explain the difference between Microprocessors & Microcontrollers, Architecture of 8051 Microcontroller, Interfacing memory and Instruction set of 8051 2. Write 8051 Assembly level programs using 8051 instruction set 3. Explain the interrupt system, operation of Timer Counters and Serial port of 8051 4. Write 8051 Assembly language program to generate timings and waveforms using 8051 timers, to send & receive serial port and to generate an external interrupt using a switch serial data using 8051
7	DSP LAB	15ECL57	CO1 CO2 CO3 CO4 CO5	CO1 CO2 CO3 CO4 CO5 1. Write 8051 C programs to generate square wave on 8051 I/O port pin using interrupt and to send & receive serial data using 8051 serial port 2. Interface simple switches, simple LEDs, ADC0804, LCD and Stepper Motor to 8051 using 8051 I/O ports 3. Implementation of discrete controllers using DSP processor and verify the results 4. Realize the digital filters using a simulation tool and a DSP processor and verify the frequency and phase response 5. Write the Verilog VHDL programs to simulate Combinational circuits & Dataflow, Behavioral and Gate level Abstractions
8	HDL LAB	15ECL58	CO1 CO2 CO3 CO4	CO1 CO2 CO3 CO4 1. Describe sequential circuits like flip flops and counters in Behavioral description and obtain simulation waveforms 2. Synthesize combinational and Sequential circuits on programmable ICs and test the hardware 3. Interface the hardware to the programmable chips and obtain the required output


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DON BOSCO INSTITUTE OF TECHNOLOGY, BANGALORE
DEPARTMENT OF TELE COMMUNICATION ENGINEERING
 Course Outcomes AY 2020-21 (ODD Semester)

7th SEM (17 scheme)			
Sl No	Subject Name	Subject Code	Course Outcomes (CO)
1	CRYPTOGRAPHY and NETWORK SECURITY	17TE71	CO1 1.Use basic cryptographic algorithms to encrypt the data CO2 2.Generate some pseudorandom numbers required for cryptographic applications CO3 3.Understand concept of data authentication and integrity. CO4 4.Explain network security protocols. CO1 1.Understand the fundamentals of remote sensing-components, signals, and systems. CO2 2.Learn the theory behind various remote sensors and their signal processing requirements CO3 3.Interpret the satellite data for drawing inferences and conclusions towards the events in space and
2	Satellite Communication and Remote Sensing	17TE72	CO1 1.Demonstrate a clear understanding of MOS transistor theory, CMOS fabrication flow and technology CO2 2.Use the physical design aspects to draw the basic gates using the stick and layout diagrams Interpret Memory elements along with timing considerations. Demonstrate CO3 3.knowledge of FPGA based system design. CO4 4.Interpret testing and testability issues in VLSI Design CO1 1.Understand basics of Multimedia different multimedia networks and applications CO2 2 to compress audio and video. Describe multimedia Communication across Networks
3	CMOS VLSI Design	17TE73	CO1 1.Analyse different media types to represent them in digital form. CO2 2.Learn the architecture of DSP algorithms on DSP processors CO3 3.Able to implement programs on DSP Processors. CO4 4.Types of text and images using different compression techniques and analyse DMS
4	DSP Algorithms & Architecture	17EC751	CO1 1.Understand the basics of DSP algorithms on DSP processors CO2 2.Demonstrate Time Division Multiplexing. Design the Digital Modulation Techniques. CO3 3.Simulate the Digital Communication concepts, Compute and Display various parameters along with Plots/Figures
5	Digital Communication Lab	17TE176	CO1 1.Design and Generate Line codes for Signal Transmission. Analyze the characteristics of an optical communication system CO2 2.Simulate the Digital Communication concepts, Compute and Display various parameters along with Plots/Figures
6	CCN Lab	17TEL77	CO1 1.Design and Simulate Network elements with various Protocols and Standards CO2 2.Use the Network Simulator Tools for learning and Practice of Networking Algorithms. CO3 3.Demonstrate the Working of various Protocols and Algorithms using C Programming
7			 

7th SEM(15 scheme)

No	Subject Name	Subject Code	Course Outcomes (CO)			
1	CRYPTOGRAPHY and NETWORK SECURITY	15STE71	CO1	1. Use basic cryptographic algorithms to encrypt the data		
			CO2	2. Generate some pseudorandom numbers required for cryptographic applications		
			CO3	3. Understand concept of data authentication and integrity.		
			CO4	4. Explain network security protocols		
			CO1	1.Understand the fundamentals of remote sensing-components, signals, and systems,		
2	Satellite Communication and Remote Sensing	15TEL72	CO2	2. Learn the theory behind various remote sensors and their signal processing requirements		
			CO3	3. Interpret the satellite data for drawing inferences and conclusions towards the events in space and planet systems		
			CO1	1.Demonstrate a clear understanding of MOS transistor theory, CMOS fabrication flow and technology scaling.		
3	CMOS VLSI Design	15STE73	CO2	2.Use the physical design aspects to draw the basic gates using the stick and layout diagrams. Interpret Memory elements along with timing considerations		
			CO3	3.Knowledge of FPGA based system design.		
			CO4	4. Interpret testing and testability issues in VLSI Design.		
			CO1	1.Understand basics of Multimedia different multimedia networks and applications		
4	Multimedia Communication	15EC741	CO2	2.to compress audio and video. Describe multimedia Communication across Networks.		
			CO3	3.Analyse different media types to represent them in digital form.		
			CO4	4.Types of text and images using different compression techniques and analyse DMS		
5	DSP Algorithms & Architecture	15EC751	CO1	1.Understand the basics of DSP algorithms on DSP processors		
			CO2	2.Learn the architecture of DSP processors.		
			CO3	3.Able to implement programs on DSP Processors.		
			CO1	1.Demonstrate Time Division Multiplexing. Design the Digital Modulation Techniques.		
6	Digital Communication Lab	15TEL76	CO2	2.Design and Generate Line codes for Signal Transmission. Analyze the characteristics of an optical communication system		
			CO3	3.Simulate the Digital Communication concepts. Compute and Display various parameters along with Plot/figures		
			CO1	1.Design and Simulate Network elements with various Protocols and Standards		
			CO2	2.Use the Network Simulator Tools for learning and Practice of Networking Algorithms.		
7	CCN Lab	15TEL77	CO2	3.Demonstrate the Working of various Protocols and Algorithms using C Programming		
			CO3			

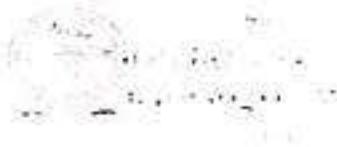
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COURSE OUTCOMES

I st SEM-Physics cycle

Sl. No	Subject Name	Subject Code		Course Outcomes(CO)
1	calculus and linear Algebra	18MAT11	CO1	Apply the knowledge of calculus to solve problems related to polar curves and its in determining the bentness of a curve.
			CO2	Learn the notion of partial differentiation to calculate rates of changes of multivariate function and solve problems related to composite functions and jacobians.
			CO3	Evaluate double and triple integrals, Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing the area and volumes
			CO4	Solve first order linear and nonlinear differential equation analytically using standard methods.
			CO5	Make use of matrix theory for solving system of linear equation and compute Eigen values and Eigen vector required for matrix diagonalization process.
2	Engineering Physics	18PHY12	CO1	Understand various types of oscillations and their implications, the role of Shock waves in various fields.
			CO2	Recognize the elastic properties of materials for engineering
			CO3	Realize the interrelation between time varying electric field and magnetic field, the transverse nature of the EM waves and their role in optical fiber communication
			CO4	Compute Eigen values, Eigen functions for a particle using Time independent 1-D Schrodinger's wave equation. Apprehend the principle of laser, working of different types of lasers and applications
			CO5	Understand various electrical and thermal properties of materials like conductors, semiconductors and dielectrics using different theoretical models
3	Basic Electrical engineering	18ELE13	CO1	Analyse to Ac and Dc circuits
			CO2	Explain the principle of operation and construction of single phase transformers
			CO3	Explain the principle of operation and construction of DC machine and synchronous machines
			CO4	Explain the principle of operation and construction of three phase induction motors
			CO5	Discuss the concept of electrical wiring circuit protecting devices and earthing
4	Elements of Civil Engineering & Mechanics	18CIV14	CO1	Mention the applications of various fields of Civil Engineering.
			CO2	Compute the resultant of given force system subjected to various loads.
			CO3	Comprehend the action of Forces, Moments and other loads on systems of rigid bodies and compute the reactive forces that develop as a result of the external loads.
			CO4	Locate the Centroid and compute the Moment of Inertia of regular and built-up sections
			CO5	Express the relationship between the motion of bodies and analyze the bodies in motion

5	Engineering Graphics	18EGDL15	CO1	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.
			CO2	Produce computer generated drawings using CAD software
			CO3	Use the knowledge of engineering drawing to represent engineering information/concepts and convert the same in the form of drawings
			CO4	Develop isometric drawings of simple objects reading the orthographic projections of those objects
			CO5	Make use of matrix theory for solving system of linear equation and compute Eigen values and Eigen vector required for matrix diagonalization process.
6	Engineering Physics Lab	18PHYL16	CO1	Recall the concepts of interference of light, diffraction of light, Fermi energy
			CO2	Understand the principles of operations of optical fibers and semiconductor devices such as photodiode, and NPN transistor, and frequency response of LCR circuits
			CO3	Determine elastic moduli and moment of inertia of given materials with the help of suggested procedures
			CO4	Gain practical knowledge of Magnetic field intensity due to current and spring constant of a spring.
			CO5	Understand the importance of measurement procedure, honest recording and representing the data, reproduction of final results
7	Basic Electrical Engg. Lab	18ELEL17	CO1	Identify the common electrical components and measuring instruments used for conducting experiments in the electrical laboratory
			CO2	Compare power factor of lamps.
			CO3	Determine impedance of an electrical circuit and power consumed in a three phase load
			CO4	Determine earth resistance and understand two way and three way control of lamps
8	Technical English	18EGH18	CO1	Use grammatical English and essentials of language skills and identify the nuances phonetics, intonation and flawless pronunciation
			CO2	Implement English vocabulary at command and language proficiency
			CO3	Identify common errors in spoken and written communication
			CO4	Understand and improve the non verbal communication and kinesics
			CO5	Perform well in campus recruitment, engineering and all other general competitive exams

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I-term Chemistry cycle				
1	Advanced Calculus and Numerical Methods	18MAT11	CO1	Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness of a curve.
			CO2	Learn the notion of partial differentiation to calculate rates of change of multivariate functions and solve problems related to composite functions and Jacobians.
			CO3	Apply the concepts of change of order of integration and variables to evaluate multiple integrals and their usage in computing the area and volumes.
			CO4	Solve first order linear/nonlinear differential equation analytically using standard methods
			CO5	Make use of matrix theory for solving system of linear equations and compute eigen values and eigenvectors required for matrix diagonalization process.
2	Engineering Chemistry	18CHE12	CO1	Use of free energy in equilibria, rationalize bulk properties and processes using thermodynamic considerations, electrochemical energy system.
			CO2	Causes and effects of corrosion of metals and control of corrosion. Modification of surface properties of metals to develop resistance to corrosion, wear, tear, impact etc. by electroplating and electroless plating.
			CO3	Production & consumption of energy for industrialization of country and living standards of people. Electrochemical and concentration cells. Classical, modern batteries and fuel cells. Utilization of solar energy for different useful forms of energy.
			CO4	Environmental pollution, waste management and water chemistry.
			CO5	Different techniques of instrumental methods of analysis. Fundamental principles of nano materials.
3	C Programming for Problem Solving	18CPS13	CO1	Illustrate simple algorithms from the different domains such as mathematics , Physics, etc.
			CO2	Construct a programming solution to the given problem using C
			CO3	Identify and correct the syntax and logical errors in C programs.
			CO4	Modularize the given problem using functions & structures.
4	Basic Electronics	18ELN14	CO1	Describe the operations of diodes, BJT, FET and Operational Amplifiers.
			CO2	Design and explain the construction of rectifiers, regulators, amplifiers and oscillators.
			CO3	Describe general operating principals of SCRs and its application.
			CO4	explain the different number system and their conversions and construct simple combinational and sequential logic circuits using Flip-Flops
			CO5	Describe the basic principle of operation of communication system and mobile phones.
5	Elements of Mechanical Engineering	18ME15	CO1	Identify different sources of energy, their conversion process and also describe the basic concepts of thermodynamics and solving simple numerical problems on steam.
			CO2	Explain the working principle of steam boilers, hydraulic Turbines & pumps.
			CO3	Demonstrate the working principles of an I.C Engine, Refrigeration, air conditioning and also calculate the performance parameters of an I. C engine.
			CO4	Recognize & Classify the various engineering materials, metal joining processes and power transmission elements. Also solve simple numerical on power transmission elements

			COs	Describe the working of conventional machine Tools, Machining processes and the advanced manufacturing system.
6	Engineering Chemistry Laboratory	ISCHEL16	C - 1	Demonstrate different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results.
			C62	Carry out different types of titration for estimation of concerned in materials using comparatively more quantities of materials involved for good results.
7	C Programming Laboratory	18CPL17	CO1	Write Algorithms, flowchart and program for simple problems
			CO2	Correct syntax and logical errors to execute a program.
			CO3	Write iterative and wherever possible recursive programs.
			CO4	Demonstrate use of functions, arrays, strings, structures and pointers in problem solving.
8	Technical English-I/II	18EGH18	CO1	Use grammatical English and essentials of language skills and identify the nuances phonetics, intonation and flawless pronunciation
			CO2	Implement English vocabulary at command and language proficiency
			CO3	Identify common errors in spoken and written communication
			CO4	Understand and improve the non verbal communication and kinesics
			CO5	Perform well in campus recruitment, engineering and all other general competitive exams

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SL.NO	Subject Name	Subject Code	COURSE OUTCOMES(CO)				
1	Complex Analysis, Probability and statistical methods	18MAT41	CO1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.			
			CO2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.			
			CO3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.			
			CO4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.			
			CO5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.			
2	DESIGN AND ANALYSIS OF ALGORITHMS	18CS42	CO1	Describe computational solution to well known problems like searching, sorting etc.			
			CO2	Estimate the computational complexity of different algorithms.			
			CO3	Devise an algorithm using appropriate design strategies for problem solving.			
3	OPERATING SYSTEMS	18CS43	CO1	Demonstrate need for OS and different types of OS			
			CO2	Apply suitable techniques for management of different resources			
			CO3	Use processor, memory, storage and file system commandsRealize the different concepts of OS in platform of usage through case studies			
			CO4	Realize the different concepts of OS in platform of usage through case studies			
4	MICROCONTROLLER AND EMBEDDED SYSTEMS	18CS44	CO1	Describe the architectural features and instructions of ARM microcontroller			
			CO2	Apply the knowledge gained for Programming ARM for different applications.			
			CO3	Interface external devices and I/O with ARM microcontroller.			
			CO4	Interpret the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.			
			CO5	Develop the hardware /software co-design and firmware design approaches.			
			CO6	Demonstrate the need of real time operating system for embedded system applications			
5	OBJECT ORIENTED CONCEPTS	18CS45	CO1	Explain the object-oriented concepts and JAVA			
			CO2	Develop computer programs to solve real world problems in Java			
			CO3	Develop simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles using swing			

6	DATA COMMUNICATION	18CS46	CO1	Explain the various components of data communication.
			CO2	Explain the fundamentals of digital communication and switching.
			CO3	Compare and contrast data link layer protocols.
			CO4	Summarize IEEE 802.xx standards
7	DESIGN AND ANALYSIS OF ALGORITHMS LABORATORY	18CSL47	CO1	Design algorithms using appropriate design techniques (brute-force, greedy, dynamic programming, etc.)
			CO2	Implement a variety of algorithms such as sorting, graph related, combinatorial, etc., in a high level language.
			CO3	Analyze and compare the performance of algorithms using language features.
			CO4	Apply and implement learned algorithm design techniques and data structures to solve real-world problems.
8	MICROCONTROLLER AND EMBEDDED SYSTEMS LABORATORY	18CSL48	CO1	Develop and test program using ARM7TDMI/LPC2148
			CO2	Conduct the following experiments on an ARM7TDMI/LPC2148 evaluation board using evaluation version of Embedded 'C' & Keil Uvision-4 tool/compiler.

Signature

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6TH SEM 18-SEHEME



SL.NO	Subject Name	Subject Code	COURSE OUTCOMES(CO)		
1	FILE STRUCTURES	18IS61	CO1	Choose appropriate file structure for storage representation.	
			CO2	Identify a suitable sorting technique to arrange the data.	
			CO3	Select suitable indexing and hashing techniques for better performance to a given problem.	
2	SOFTWARE TESTING	18IS62	CO1	Derive test cases for any given problem	
			CO2	Compare the different testing techniques	
			CO3	Classify the problem into suitable testing model	
			CO4	Apply the appropriate technique for the design of flow graph.	
			CO5	Create appropriate document for the software artefact.	
3	WEB TECHNOLOGY AND ITS APPLICATIONS	18CS63	CO1	Adapt HTML and CSS syntax and semantics to build web pages.	
			CO2	Construct and visually format tables and forms using HTML and CSS	
			CO3	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically.	
			CO4	Appraise the principles of object oriented development using PHP	
			CO5	Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features.	
4	DATA MINING AND DATA WAREHOUSING	18CS641	CO1	Identify data mining problems and implement the data warehouse	
			CO2	Write association rules for a given data pattern.	
			CO3	Choose between classification and clustering solution.	
5	OBJECT ORIENTED MODELING AND DESIGN	18CS642	CO1	Describe the concepts of object-oriented and basic class modelling.	
			CO2	Draw class diagrams, sequence diagrams and interaction diagrams to solve problems.	
			CO3	Choose and apply a befitting design pattern for the given problem.	
6	CLOUD COMPUTING AND ITS APPLICATIONS	18CS643	CO1	Explain cloud computing, virtualization and classify services of cloud computing	
			CO2	Illustrate architecture and programming in cloud	
			CO3	Describe the platforms for development of cloud applications and List the application of cloud.	
7	ADVANCED JAVA AND J2EE	18CS644	Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficient programs		
			CO1	Build client-server applications and TCP/IP socket programs	
			CO2		

			C03	Interpret database access and details for managing information using the JDBC API
			C04	Describe how servlets fit into Java-based web application architecture
			C05	Develop reusable software components using Java Beans
8	INFORMATION MANAGEMENT SYSTEM	18IS645	CO1	Describe the role of information technology and information systems in business
			CO2	Record the current issues of information technology and relate those issues to the firm
			CO3	Interpret how to use information technology to solve business problems
9	MOBILE APPLICATION DEVELOPMENT	18CSMP68	CO1	Create, test and debug Android application by setting up Android development environment
			CO2	Implement adaptive, responsive user interfaces that work across a wide range of devices.
			CO3	Infer long running tasks and background work in Android applications
			CO4	Demonstrate methods in storing, sharing and retrieving data in Android applications
			CO5	Analyze performance of android applications and understand the role of permissions and security
			CO6	Describe the steps involved in publishing Android application to share with the world
10	INTRODUCTION TO DATA STRUCTURES AND ALGORITHM	18CS652	CO1	Identify different data structures in C programming language
			CO2	Appraise the use of data structures in problem solving
			CO3	Implement data structures using C programming language
			CO1	Explain the object-oriented concepts and JAVA
11	PROGRAMMING IN JAVA	18CS653	CO2	Develop computer programs to solve real world problems in Java. Develop simple GUI interfaces for a computer program to interact with users
			CO1	List out the requirements for the given problem
			CO2	Design and implement the solution for given problem in any programming language(C,C++,JAVA)
12	SOFTWARE TESTING LABORATORY	18ISL66	CO3	Derive test cases for any given problem
			CO4	Apply the appropriate technique for the design of flow graph
			CO5	Create appropriate document for the software artefact
	FILE STRUCTURES LABORATORY WITH MINI PROJECT	18ISL67	CO1	Implement operations related to files
			CO2	Apply the concepts of file system to produce the given application
			CO3	Evaluate performance of various file systems on given parameters

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8TH SEM-18 scheme

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SL.NO	Subject Name	Subject Code	COURSE OUTCOMES(CO)
1	INTERNET OF THINGS	18CS81	CO1 Interpret the impact and challenges posed by IoT networks leading to new architectural models.
			CO2 Compare and contrast the deployment of smart objects and the technologies to connect them to network
			CO3 Appraise the role of IoT protocols for efficient network communication.
			CO4 Elaborate the need for Data Analytics and Security in IoT
			CO5 Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.
2	MOBILE COMPUTING	18CS821	CO1 Explain state of art techniques in wireless communication.
			CO2 Discover CDMA, GSM, Mobile IP, Wimax
			CO3 Demonstrate program for CLDC, MIDP let model and security concerns
3	NOSQL DATABASE	18CS823	CO1 Define, compare and use the four types of NoSQL Databases (Document-oriented, KeyValue Pairs, Column-oriented and Graph).
			CO2 Demonstrate an understanding of the detailed architecture, define objects, load data, query data and performance tune Column-oriented NoSQL databases.
			CO3 Explain the detailed architecture, define objects, load data, query data and performance tune Document-oriented NoSQL databases.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

(NBA Accredited Department)

COURSE OUTCOMES



4TH SEM IR-SCHEME

Sl. No	Subject Name	Subject Code	Course Outcomes(CO)
1	COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS	15MAT41	CO1 Use the concepts of analytic function and complex potential to solve the problems arising in electromagnetic field theory, communication, planning, analysis, design, construction, and deployment.
			CO2 Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
			CO3 Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
			CO4 Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
			CO5 Construct joint probability distributions and demonstrate the validity of testing the hypothesis.
2	ANALOG CIRCUITS	18EC42	CO1 Understand the characteristics of BJTs and FETs
			CO2 Design and analyze BJT and FET amplifier circuits
			CO3 Design sinusoidal and non-sinusoidal oscillators
			CO4 Understand the functioning of linear ICs
			CO5 Design of Linear IC based circuits
3	CONTROL SYSTEMS	18EC43	CO1 Develop the mathematical model of mechanical and electrical systems
			CO2 Develop transfer function for a given control system using block diagram reduction techniques and signal flow graph method
			CO3 Determine the time domain specifications for first and second order systems
			CO4 Determine the stability of a system in the time domain using Routh-Hurwitz criterion and Root-locus technique
			CO5 Determine the stability of a system in the frequency domain using Nyquist and bode plots
4	ENGINEERING STATISTICS AND LINEAR ALGEBRA	18EC44	CO1 Identify and associate Random Variables and Random Processes in Communication events
			CO2 Analyze and model the Random events in typical communication events to extract quantitative statistical parameters
			CO3 Analyze and model typical signal sets in terms of a basis function set of Amplitude, phase and frequency
			CO4 Demonstrate by way of simulation or emulation the ease of analysis employing basis functions, statistical representation and Eigen values.



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COURSE OUTCOMES

4TH SEM 18-SCHEME

SL. No.	SUBJECT NAME	Subject Code	Course Outcomes(CO)				
1	COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS	18MAT41	CO1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory, communication, planning, analysis, design, construction, and deployment			
			CO2	Utilize conformal transformation and complex integral arising in airfoil theory, fluid flow visualization and image processing			
			CO3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field			
			CO4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data			
			CO5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis			
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			CO2	Analyze and model the Random events in typical communication events to extract quantitative statistical parameters			
			CO3	Analyze and model typical signal sets in terms of a basis function set of Amplitude, phase and frequency			
			CO4	Demonstrate by way of simulation or emulation the ease of analysis employing basis functions, statistical representation and Eigen values			

5	SIGNALS AND SYSTEMS	18EC45	CO1 Analyze the different types of signals and systems CO2 Determine the linearity, causality, time-invariance and stability properties of continuous and discrete CO3 Represent continuous and discrete systems in time and frequency domain using different transforms
6	MICROCONTROLLER	18EC46	CO1 Explain the difference between Microprocessors & Microcontrollers. Architecture of 8051 CO2 Microcontroller, Interfacing of 8051 to external memory and Instruction set of 8051 CO3 Write 8051 Assembly level programs using 8051 instruction set CO4 Explain the Interrupt system, operation of Timers/Counters and Serial port of 8051 CO5 Write 8051 Assembly language program to generate timings and waveforms using 8051 timers, to send & receive serial data using 8051 serial port and to generate an external interrupt using a switch CO6 Write 8051 Assembly language programs to generate square wave on 8051 I/O port pin using interrupt and C Programme to send & receive serial data using 8051 serial port CO7 Interface simple switches, simple LEDs, ADC 0804, LCD and Stepper Motor to 8051 using 8051 I/O ports
			CO1 Write Assembly language programs in 8051 for solving simple problems that manipulate input data CO2 Interface different input and output devices to 8051 and control them using Assembly language programs CO3 Interface the serial devices to 8051 and do the serial transfer using C programming
			CO1 Design analog circuits using BJTs/FETs and evaluate their performance characteristics CO2 Design analog circuits using OP AMPS for different applications CO3 Simulate and analyze analog circuits that use ICs for different electronic applications
			CO1 Write Assembly language programs in 8051 for solving simple problems that manipulate input data CO2 Interface different input and output devices to 8051 and control them using Assembly language programs CO3 Interface the serial devices to 8051 and do the serial transfer using C programming
			CO1 Design analog circuits using BJTs/FETs and evaluate their performance characteristics CO2 Design analog circuits using OP AMPS for different applications CO3 Simulate and analyze analog circuits that use ICs for different electronic applications
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COURSE OUTCOMES

SL No	SUBJECT NAME	Subject Code	6TH SEM IS-SCHEME	
				Course Outcomes(CO)
1	DIGITAL COMMUNICATION	18EC61	CO1	Associate and apply the concepts of Bandpass sampling to well specified signals and channels.
			CO2	Analyse and compute performance parameters and transfer rates for low pass and bandpass symbol under ideal and corrupted non band limited channels.
			CO3	Test and validate symbol processing and performance parameters at the receiver under ideal and corrupted bandlimited channels.
			CO4	Demonstrate that bandpass signals subjected to corruption and distortion in a bandlimited channel can be processed at the receiver to meet specified performance criteria.
2	EMBEDDED SYSTEMS	18EC62	CO1	Describe the architectural features and instructions of 32 bit microcontroller ARM Cortex M3.
			CO2	Apply the knowledge gained for Programming ARM Cortex M3 for different applications
			CO3	Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.
			CO4	Develop the hardware software co-design and firmware design approaches.
			CO5	Explain the need of real time operating system for embedded systems applications.
3	MICROWAVE and ANTENNAS	18EC63	CO1	Describe the use and advantages of microwave transmission
			CO2	Analyse various parameters related to microwave transmission lines and waveguides
			CO3	Identify microwave devices for several applications
			CO4	Analyse various antenna parameters necessary for building a RF system
			CO5	Recommend various antenna configurations according to the applications.
4	DIGITAL SYSTEM DESIGN USING VERILOG	18EC644	CO1	Construct the combinational circuits, using discrete gates and programmable logic devices
			CO2	Describe how arithmetic operations can be performed for each kind of code, and also combinational circuits that implement arithmetic operations.
			CO3	Design a semiconductor memory for specific chip design
			CO4	Design embedded systems using small microcontrollers, larger CPUs/DSPs, or hard or soft processor cores.
			CO5	Synthesize different types of I/O controllers that are used in embedded system

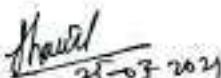
5	MOBILE APPLICATION DEVELOPMENT	18CS651	CO1 Create, test and debug Android application by setting up Android development environment	
			CO2 Implement adaptive, responsive user interfaces that work across a wide range of devices	
			CO3 Infer long running tasks and background work in Android applications	
			CO4 Demonstrate methods of storing, sharing and retrieving data in Android applications	
			CO5 Analyze performance of android applications and understand the role of permissions and security	
6	PROGRAMMING IN JAVA	18CS653	CO1 Explain the object-oriented concepts and JAVA	
			CO2 Develop computer programs to solve real world problems in Java	
			CO3 Develop simple GUI interfaces for a computer program to interact with users	
7	WORLD CLASS MANUFACTURING		18ME652	CO1 Understand recent trends in manufacturing
				CO2 Demonstrate the relevance and basics of World Class Manufacturing
		CO3 Understand customization of product for manufacturing		
		CO4 Understand the implementation of new technologies		
		CO5 Compare the existing industries with WCM industries		
8	EMBEDDED SYSTEMS LAB	18ECL66	CO1 Understand the instruction set of 32 bit microcontroller ARM Cortex M3, and the software tool required for programming in Assembly and C language	
			CO2 Develop assembly language programs using ARM Cortex M3 for different applications	
			CO3 Interface external devices and I/O with ARM Cortex M3	
			CO4 Develop C language programs and library functions for embedded system applications	
9	COMMUNICATION LAB		CO1 Determine the characteristics and response of microwave waveguide	
		18ECL67	CO2 Determine the characteristics of microstrip antennas and devices and compute the parameters associated with it	
			CO3 Design and test the digital and analog modulation circuits and display the waveforms	
			CO4 Simulate the digital modulation systems and compare the error performance of basic digital modulation schemes	

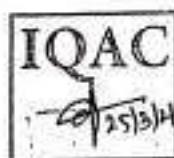
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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COURSE OUTCOMES

8TH SEM 13-SCHME

SL. No.	SUBJECT NAME	Subject Code	Course Outcomes(CO)	
			CO1	CO2
1	WIRELESS CELLULAR and LTE 4G BROADBAND	17EC81	Understand the system architecture and the functional standard specified in LTE 4G	
			Analyze the role of LTE radio interface protocols and EPS Data convergence protocols to set up, reconfigure and release data and voice from users.	
			Demonstrate the UTRA4 and EPS handling processes from set up to release including mobility management for a variety of data call scenarios.	
			Test and Evaluate the Performance of resource management and packet data processing and transport algorithms	
2	FIBER OPTICS and NETWORKS	17EC82	Classification and working of optical fiber with different modes of signal propagation	
			Describe the transmission characteristics and losses in optical fiber communication	
			Describe the construction and working principle of optical connectors, multiplexers and amplifiers	
			Describe the constructional features and the characteristics of optical sources and detectors	
			Illustrate the networking aspects of optical fiber and describe various standards associated with it	
3	NETWORK AND CYBER SECURITY	17EC835	Explain network security protocols	
			Understand the basic concepts of cyber security	
			Discuss the cyber security problems	
			Explain Enterprise Security Framework	
			Apply concept of cyber security framework in computer system administration	

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DEPARTMENT OF COMPUTER SCIENCE ENGINEERING



4TH SEM 2018 SCHEME

Course Outcomes(CO)

Sl. No.	Subject Name	Subject Code	
1	COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS	18MATH1	CO1 Use the concepts of analytic function and complex potentials to solve the problems arising in electrostatics field theory, electromagnetic field theory, thermodynamics, planning, analysis, design, construction, and deployment.
			CO2 Utilize coordinate transformation and complex integration in solving the problems in physics.
			CO3 Calculate probability and related problems using the probability theory.
			CO4 Make use of the correlation and regression and run fit a suitable mathematical model for the statistical data.
			CO5 Compute joint probability and related problems using the theory of sets and logic.
2	DESIGN AND ANALYSIS OF ALGORITHMS	18CS42	CO1 Describe computational models to well known problems like searching, sorting etc.
			CO2 Estimate the computational complexity of different algorithms.
			CO3 Devise an algorithm using appropriate design strategies for problem solving.
3	OPERATING SYSTEMS	18CS43	CO1 Demonstrate need for OS and different types of OS.
			CO2 Apply suitable techniques for management of different resources.
			CO3 Use processor, memory, storage and file system commands.
			CO4 Explain the different concepts of OS in platform of usage through case studies.
			CO5 Describe the architectural features and instructions of ARM microcontroller.
4	MICROCONTROLLER AND EMBEDDED SYSTEMS	18CS44	CO1 Adopt the basic hardware components and their selection method based on the characteristics and attributes of an embedded system. • Develop the hardware with a given design and demonstrate design approaches.
			CO2 Interface external devices and I/O with ARM microcontroller.
			CO3 Demonstrate the need of real time operating system for embedded system applications.
			CO4 Demonstrate the need of real time operating system for embedded system applications.
			CO5 Explain the object-oriented concepts and JAVA.
5	OBJECT ORIENTED CONCEPTS	18CS45	CO1 Develop computer programs to solve real world problems in Java.
			CO2 Develop simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles using swing.
			CO3 Explain the various components of data communication.
6	DATA COMMUNICATION	18CS46	CO1 Explain the fundamentals of digital communication and switching.
			CO2 Compare and contrast data link layer protocols.
			CO3 Summarize IEEE 802.11 standards.
			CO4 Design algorithms using appropriate design techniques (backtracking, greedy, dynamic programming, etc.)
7	DESIGN AND ANALYSIS OF ALGORITHMS LABORATORY	18CSL47	CO1 Implement a variety of algorithms such as sorting, graph related, combinatorial, etc., in a high level language.
			CO2 Analyze and compare the performance of algorithms using language features.
			CO3 Apply and implement learned algorithm design techniques and data structures to solve real-world problems.
8	MICROCONTROLLER AND EMBEDDED SYSTEMS LABORATORY	18CSL48	CO1 Develop and test programs using ARM7TDMI LPC2148.
			CO2 Conduct the following experiments on an ARM7TDMI LPC2148 evaluation board using evaluation version of Embedded C & Keil Uvision tool compiler.

6th SEM 2018-SCHEME

1	SYSTEM SOFTWARE AND COMPILERS	18CS61	CO1 Explain system software.
			CO2 Design and develop lexical analyzers, parsers and code generators.
2	COMPUTER GRAPHICS AND VISUALIZATION	18CS62	CO3 Utilize lex and yacc tools for implementing different concepts of system software.
			CO4 Design and implement algorithms for 3D graphics rendering and surfaces.
			CO1 Design and implement algorithms for 3D graphics rendering and surfaces.
			CO2 Illustrate Geometric transformations on both 2D and 3D objects.
			CO3 Apply concepts of clipping and hidden surface detection in 2D and 3D viewing, and illumination Models.
			CO4 Decide suitable hardware and software for developing graphics packages using OpenGL.

3	WEB TECHNOLOGY AND ITS APPLICATIONS	1BCTS03	C01	Adapt HTML and CSS syntax and semantics to build web pages.
			C02	Construct and visually format tables and forms using HTML and CSS.
			C03	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically.
			C04	Appraise the principles of object oriented development using PHP.
			C05	Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features.
4	OPERATING SYSTEMS	1BCTS04	C01	Introduce concepts and terminology used in OS.
			C02	Explain threading and multithreaded systems.
			C03	Illustrate process synchronization and concept of Deadlock.
			C04	Introduce Memory and Virtual memory management, file system and storage techniques.
5	DATA MINING AND DATA WAREHOUSING	1BCTS05	C01	Identify data mining problems and implement the data warehouse.
			C02	Demonstrate the association rules for a given data pattern.
			C03	Discuss between classification and clustering solution.
			C04	Design and Develop Android application by setting up Android development environment.
6	MOBILE APPLICATION DEVELOPMENT	1BCTS055	C02	Implement adaptive, responsive user interfaces that work across a wide range of devices.
			C03	Explain the memory and background work in Android applications.
			C04	Demonstrate methods in storing, sharing and retrieving data in Android applications.
			C05	Discuss the performance of android applications and understand the role of permissions and security.
			C06	Describe the steps involved in publishing Android application in share with the world.
7	SYSTEM SOFTWARE AND OPERATING	1BCTS067	C01	Implement and demonstrate Linux's and Pferos's.
			C02	Implement different algorithms required for management, scheduling, allocation and communication used in operating systems.
8	COMPUTER GRAPHICS LABORATORY WITH MINI PROJECT	1BCTS068	C01	Apply the concepts of computer graphics.
			C02	Implement computer graphics applications using OpenGL.
			C03	Implement real world problems using OpenGL.
6th SEM 2017-SCHEME				
1	SYSTEM SOFTWARE AND COMPILERS	1BCTS01	C01	Explain system software.
			C02	Design and develop lexical analyzers, parsers and code generators.
			C03	Utilize lex and yacc tools for implementing different concepts of system software.
2	COMPUTER GRAPHICS AND VISUALIZATION	1BCTS02	C01	Design and implement algorithms for 2D graphics primitives and attributes.
			C02	Illustrate Geometric Transformations on both 2D and 3D objects.
			C03	Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and illumination Models.
			C04	Decode include headers and software for developing graphics packages using OpenGL.
3	WEB TECHNOLOGY AND ITS APPLICATIONS	1BCTS03	C01	Adapt HTML and CSS syntax and semantics to build web pages.
			C02	Construct and visually format tables and forms using HTML and CSS.
			C03	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically.
			C04	Appraise the principles of object oriented development using PHP.
			C05	Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features.
4	OPERATING SYSTEMS	1BCTS04	C01	Introduce concepts and terminology used in OS.
			C02	Explain threading and multithreaded systems.
			C03	Illustrate process synchronization and concept of Deadlock.
			C04	Introduce Memory and Virtual memory management, file system and storage techniques.
5	DATA MINING AND DATA WAREHOUSING	1BCTS05	C01	Identify data mining problems and implement the data warehouse.
			C02	Demonstrate the association rules for a given data pattern.
			C03	Discuss between classification and clustering solution.

6	MOBILE APPLICATION DEVELOPMENT	17CS655	C01 Design and Develop Android application by setting up Android development environment
			C02 Implement adaptive, responsive user interface that work across a wide range of devices
			C04 Demonstrate methods to store, sharing and retrieving data in Android applications
			C05 Discuss the performance of android applications and understand the role of permissions and security
7	SYSTEM SOFTWARE AND OPERATING		C06 Describe the steps involved in publishing Android application to share with the world
8	COMPUTER GRAPHICS LABORATORY WITH MINI PROJECT	17CSL68	C01 Implement and demonstrate Local's and Parallel's
			C02 Implement different algorithms required for management, scheduling, allocation and communication used in operating systems
			C03 Apply the concepts of computer graphics
			C04 Implement computer graphics application using OpenGL
			C05 Implement real world problems using OpenGL

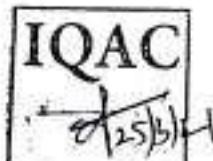
8th SEM 2017-SCHME

Course Outcomes(CO)

1	INTERNET OF THINGS TECHNOLOGY	17CS88	C01 Interpret the impact and challenges posed by IoT networks leading to new architectural models
			C02 Compare and contrast the deployment of smart objects and the techniques to connect them to network
			C03 Appraise the role of IoT protocols for efficient network communication
			C04 Elaborate the need for Data Analytics and Security in IoT
			C05 Illustrate different server technologies for serving real world entities and identify
			C06 Manage the concepts of HDFS and MapReduce framework
2	BIG DATA ANALYTICS	17CS82	C01 Investigate Hadoop related tools for Big Data Analytics and perform basic Hadoop Administration
			C02 Recognise the role of Business Intelligence, Data warehousing and Visualization in decision making
			C03 Define the importance of core data mining techniques for data analytics
			C04 Compare and contrast different Text Mining Techniques
3	NETWORK MANAGEMENT	17CS803	C01 Analyse the issues and challenges pertaining to management of emerging network technologies such as wireless/wireless networks and high-speed internet
			C02 Apply network management standards to manage practical networks
			C03 Formulate possible approaches for managing OSI network model
			C04 Use of SNMP for managing the network
			C05 Use of RMON for monitoring the behavior of the network
			C06 Identify the various components of network and formulate the scheme for the managing them
4	SYSTEM MODELLING AND SIMULATION	17CS804	C01 Explain the system concept and apply functional modeling method to model the activities of a static system
			C02 Describe the behavior of a dynamic system and create an analogous model for a dynamic system
			C03 Simulate the operation of a dynamic system and make improvement according to the simulation results

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DON BOSCO INSTITUTE OF TECHNOLOGY, BANGALORE-74
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
Academic Year 2020-21



2018 SCHEME - COURSE OUTCOMES

2018 SCHEME -4TH SEMESTER			
Sl. No	Subject Name	Subject Code	Course Outcomes(CO)
1	COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS	18MAT41	CO1 Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
			CO2 Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
			CO3 Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
			CO4 Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
			CO5 Construct joint probability distributions and demonstrate the validity of testing the hypothesis.
2	POWER GENERATION & ECONOMICS	18EEE42	CO1 Describe the working of hydroelectric, steam, nuclear power plants and state functions of major equipment of the power plants.
			CO2 Classify various substations and explain the functions of major Equipments in substations.
			CO3 Explain the types of grounding and its importance.
			CO4 Infer the economic aspects of power system operation and its effects.
			CO5 Explain the importance of power factor improvement.
3	TRANSMISSION & DISTRIBUTION	18EEE43	CO1 Explain transmission and distribution scheme, identify the importance of different transmission systems and types of insulators.
			CO2 Analyze and compute the parameters of the transmission line for different configurations.
			CO3 Assess the performance of overhead lines.
			CO4 Interpret corona, explain the use of underground cables.
			CO5 Classify different types of distribution systems, examine its quality & reliability.
4	ELECTRIC MOTORS	18EEE44	CO1 Explain the construction, operation and classification of DC Motor, AC motor and Special purpose motors.
			CO2 Describe the performance characteristics & applications of Electric motors.
			CO3 Demonstrate and explain the methods of testing of DC machines and determine losses and efficiency.
			CO4 Control the speed of DC motor and induction motor.
			CO5 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.
5	ELECTROMAGNET IC FIELD THEORY	18EEE45	CO1 Use different coordinate systems, Coulomb's Law and Gauss Law for the evaluation of electric fields produced by different charge configurations.
			CO2 Calculate the energy and potential due to a system of charges & Explain the behaviour of electric field across a boundary conditions.
			CO3 Explain the Poisson's, Laplace equations and behaviour of steady magnetic fields.
			CO4 Explain the behaviour of magnetic fields and magnetic materials.

6	OPERATIONAL AMPLIFIERS & LINEAR ICs	18EEE46	CO5	Asses time varying fields and propagation of waves is different.
			CO1	Describe the characteristics of ideal and practical operational amplifier.
			CO2	Design filters and signal generators using linear ICs.
			CO3	Demonstrate the application of Linear ICs as comparators and rectifiers.
			CO4	Analyze voltage regulators for given specification using op-amp and IC voltage regulators.
			CO5	Summarize the basics of PLL and Timer. media.
7	ELECTRICAL MACHINES LABORATORY -II	18EEL47	CO1	Test DC machines to determine their characteristics and also to control the speed of DC motor.
			CO2	Pre-determine the performance characteristics of DC machines by conducting suitable tests.
			CO3	Perform load test on single phase and three phase induction motor to assess its performance.
			CO4	Conduct test on induction motor to pre-determine the performance characteristics.
			CO5	Conduct test on synchronous motor to draw the performance curves.
8	OPAMP & LINEAR ICs LABORATORY	18EEL48	CO1	To conduct experiment to determine the characteristic parameters of OP-Amp.
			CO2	To design test the OP-Amp as Amplifier, adder, subtractor, differentiator and integrator.
			CO3	To design test the OP-Amp as oscillators and filters.
			CO4	Design and study of Linear IC's as multivibrators power supplies.

2018 SCHEME – 6TH SEMESTER

Sl. No	Subject Name	Subject Code	Course Outcomes (CO)	
1	CONTROL SYSTEMS	18EEE61	CO1	Analyze and model electrical and mechanical system using analogous.
			CO2	Formulate transfer functions using block diagram and signal flow graphs.
			CO3	Analyze the stability of control system, ability to determine transient and steady state time response.
			CO4	Illustrate the performance of a given system in time and frequency domains, stability analysis using Root locus and Bode plots.
			CO5	Discuss stability analysis using Nyquist plots, Design controller and compensator for a given specification.
			CO1	Model the power system components & construct per unit impedance diagram of power system.
2	POWER SYSTEM ANALYSIS - I	18EEE62	CO2	Analyze three phase symmetrical faults on power system.
			CO3	Compute unbalanced phasors in terms of sequence components and vice versa, also develop sequence networks.
			CO4	Analyze various unsymmetrical faults on power system.
			CO5	Examine dynamics of synchronous machine and determine the power system stability.
			CO1	Apply DFT and IDFT to perform linear filtering techniques on given sequences to determine the output.
3	DIGITAL SIGNAL PROCESSING	18EEE63	CO2	Apply fast and efficient algorithms for computing DFT and inverse DFT of a given sequence.
			CO3	Design and realize infinite impulse response Butterworth and Chebyshev digital filters using impulse invariant and bilinear transformation techniques.
			CO4	Develop a digital IIR filter by direct, cascade, parallel, ladder and FIR filter by direct, cascade and linear phase methods of realization.
			CO5	Design and realize FIR filters by use of window function and frequency sampling method.
			CO1	Explain the working of electric vehicles and recent trends.

	(Professional Elective)		
	18EE646	CO2	Analyze different power converter topology used for electric vehicle application.
		CO3	Develop the electric propulsion unit and its control for application of electric vehicles.
		CO4	Design converters for battery charging and explain transformer less topology.
5	World Class Manufacturing (Open Elective)	18ME652	CO1 Understand recent trends in manufacturing. CO2 Demonstrate the relevance and basics of World Class Manufacturing. CO3 Understand customization of product for manufacturing. CO4 Understand the implementation of new technologies. CO5 Compare the existing industries with WCM industries.
6	Programming in Java (Open Elective)	18CS653	CO1 Explain the object-oriented concepts and JAVA. CO2 Develop computer programs to solve real world problems in Java. CO3 Develop simple GUI interfaces for a computer program to interact with users.
7	CONTROL SYSTEM LABORATORY	18EEL66	CO1 Utilize software package and discrete components in assessing the time and frequency domain response of a given second order system. CO2 Design, analyze and simulate Lead, Lag and Lag – Lead compensators for given specifications. CO3 Determine the performance characteristics of ac and DC servomotors and synchro-transmitter receiver pair used in control systems. CO4 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. CO5 Develop a script files to plot Root locus, Bode plot and Nyquist plot to study the stability of system.
8	Digital signal processing laboratory	18EEL67	CO1 Give physical interpretation of sampling theorem in time and frequency domains. CO2 Evaluate the impulse response of a system. CO3 Perform convolution of given sequences to evaluate the response of a system. CO4 Compute DFT and IDFT of a given sequence using the basic definition and/or fast methods. CO5 Provide a solution for a given difference equation. CO6 Design and implement IIR and FIR filters CO7 Conduct experiments using software and prepare reports that present lab work
9	Mini-project	18EEMP68	CO1 Explain physical interpretation of sampling theorem in time and frequency domains CO2 Evaluate the impulse response of a system. CO3 Perform convolution of given sequences to evaluate the response of a system. CO4 Compute DFT and IDFT of a given sequence using the basic definition and/or fast methods. CO5 Provide a solution for a given difference equation. CO6 Design and implement IIR and FIR filters

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
Academic Year 2020-21

2017 SCHEME - COURSE OUTCOMES
2017 SCHEME - 6TH SEMESTER



Sl. No.	Subject Name	Subject Code	Course Outcomes(CO)
1	CONTROL SYSTEMS	17EE61	CO1 Discuss the effects of feedback and types of feedback control systems
			CO2 Evaluate the transfer function of a linear time invariant system
			CO3 Discuss the effects of feedback and types of feedback control systems
			CO4 Evaluate the transfer function of a linear time invariant system
			CO5 Evaluate the stability of linear time invariant systems
			CO6 Apply block diagram manipulation and signal flow graph methods to obtain transfer function of systems
			CO7 Demonstrate the knowledge of mathematical modeling of control systems and components
			CO8 Determine transient and steady state time response of a simple control system
			CO9 Investigate the performance of a given system in time and frequency domains
2	POWER SYSTEM ANALYSIS - I	17EE62	CO1 Discuss stability analysis using Root locus, Bode plots and Nyquist plots
			CO3 Perform short circuit analysis on a synchronous machine and simple power system to select a circuit breaker for the system
			CO4 Evaluate symmetrical components of voltages and currents in un-balanced three phase circuits
			CO5 Explain the concept of sequence impedance and sequence networks of power system components and power systems
			CO6 Analyze three phase synchronous machine and simple power systems for different unsymmetrical faults using symmetrical components
3	DIGITAL SIGNAL PROCESSING	17EE63	CO1 Compute the DFT of various signals using its properties and linear filtering of two sequences
			CO2 Apply fast and efficient algorithms for computing DFT and inverse DFT of a given sequence
			CO3 Design infinite impulse response Butterworth digital filters using impulse invariant / bilinear transformation technique
			CO4 Design infinite impulse response Chebyshev digital filters using impulse invariant or bilinear transformation technique
			CO5 Realize a digital IIR filter by direct, cascade, parallel and ladder methods of realization
			CO6 Discuss different window functions and frequency sampling method used for design of FIR filters
			CO7 Design FIR filters by use of window function or by frequency sampling method
			CO8 Realize a digital FIR filter by direct, cascade, and linear phase form
4	ELECTRICAL MACHINE DESIGN	17EE64	CO1 Discuss design factors, limitations, modern trends in design, manufacturing of electrical machines & properties of materials used in the electrical machines
			CO2 Derive the output equations of transformer, DC machines and AC machines
			CO3 Discuss selection of specific loadings and magnetic circuits of different electrical machines
			CO4 Design the field windings of DC machine and Synchronous machine
			CO5 Design stator and rotor circuits of a DC and AC machines
			CO6 Estimate the number of cooling tubes, no load current and leakage reactance of core type transformer
			CO7 Discuss short circuit ratio and its effects on performance of synchronous machines
			CO8 Design salient pole and non-salient pole alternators for given specifications
5	COMPUTER AIDED ELECTRICAL	17EE651	CO1 Discuss the terminology and types of DC and AC armature windings
			CO2 Develop armature winding diagram for DC and AC machines
			CO3 Develop a layout for substation using the standard symbols for substation equipment

	DRAWING (Professional Elective)	
6	SENSORS & TRANSDUCERS (Open Elective)	17EE662
		CO4 Draw sectional views of core and shell types transformer using the design data
		CO5 Draw sectional views of assembled DC machine or its parts using the design data or the sketches
		CO6 Draw sectional views of assembled alternator or its parts using the design data or the sketches
		CO1 Discuss need of transducers, their classification, advantages and disadvantages
		CO2 Show an understanding of working of various transducers and sensors
7	CONTROL SYSTEM LABORATORY	17EEL67
		CO3 Discuss recent trends in types of technology and their selection
		CO4 Discuss basics of signal conditioning and signal conditioning equipment
		CO5 Discuss configuration of Data Acquisition System and data conversion
		CO6 Show knowledge of data transmission and telemetry
		CO7 Explain measurement of non-electrical quantities -temperature, flow, speed, force, torque, power and viscosity
		CO8 Use software package or discrete components in assessing the time and frequency domain responses of a given second order system
8	Digital signal processing laboratory	17EFL68
		CO9 Design and analyze Lead, Lag and Lag - Lead compensators for given specifications
		CO10 Determine the performance characteristics of ac and dc servomotors and synchro-transmitter receiver pair used in control systems
		CO11 Simulate the DC position and feedback control systems study the effect of P, PI, PD and PID controller and Lead compensator on the step response of a system.
		CO12 Write a script files to plot root locus, Bode plot, Nyquist plots to study the stability of the system using a software package
		CO13 Work with a small team to carryout experiments and prepare reports that present lab work
		CO14 Give physical interpretation of sampling theorems in time and frequency domains
		CO15 Evaluate the impulse response of a system
		CO16 Perform convolution of given sequences to evaluate the response of a system

2017 SCHEME - 8TH SEMESTER			
Sl. No	Subject Name	Subject Code	Course Outcomes(CO)
1	POWER SYSTEM OPERATION AND CONTROL	17EEE81	CO1 Describe various levels of controls in power systems, the vulnerability of the system, components, architecture and configuration of SCADA.
			CO2 Solve unit commitment problems
			CO3 Explain issues of hydrothermal scheduling and solutions to hydro thermal problems
			CO4 Explain basic generator control loops, functions of Automatic generation control, speed governors
			CO5 Develop and analyze mathematical models of Automatic Load Frequency Control
			CO6 Explain automatic generation control, voltage and reactive power control in an interconnected power system
			CO7 Explain reliability, security, contingency analysis, state estimation and related issues of power systems.
2	INDUSTRIAL DRIVES AND APPLICATIONS	17EEE82	CO1 Explain the advantages and choice of electric drive
			CO2 Explain dynamics and different modes of operation of electric drives
			CO3 Suggest a motor for a drive and control of dc motor using controlled rectifiers
			CO4 Analyze the performance of induction motor drives under different conditions
			CO5 Control induction motor, synchronous motor and stepper motor drives

3	SMART GRID	17EE831	<p>CO6 Suggest a suitable electrical drive for specific application in the industry</p> <p>CO1 Discuss the progress made by different stakeholders in the design and development of smart grid</p> <p>CO2 Explain measurement techniques using Phasor Measurement Units and smart meters</p> <p>CO3 Discuss tools for the analysis of smart grid and design, operation and performance</p> <p>CO4 Discuss classical optimization techniques and computational methods for smart grid design, planning and operation</p> <p>CO5 Explain predictive grid management and control technology for enhancing the smart grid performance</p> <p>CO6 Develop cleaner, more environmentally responsible technologies for the electric system</p> <p>CO7 Discuss the computational techniques, communication, measurement, and monitoring technology tools essential to the design of the smart grid</p> <p>CO8 Explain methods to promote smart grid awareness and making the existing transmission system smarter by investing in new technology</p>
4	INTERNSHIP / PROFESSIONAL PRACTICE	17EE84	<p>CO1 Gain practical experience within industry in which the internship is done.</p> <p>CO2 Acquire knowledge of the industry in which the internship is done.</p> <p>CO3 Apply knowledge and skills learned to classroom work.</p> <p>CO4 Develop a greater understanding about career options while more clearly defining personal career goals</p> <p>CO5 Experience the activities and functions of professionals.</p> <p>CO6 Develop and refine oral and written communication skills.</p>
5	PROJECT WORK PHASE -II	17EEP85	<p>CO1 Present the project and be able to defend it.</p> <p>CO2 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.</p> <p>CO3 Habituated to critical thinking and use problem solving skills</p> <p>CO4 Communicate effectively and to present ideas clearly and coherently in both the written and oral forms.</p> <p>CO5 Work in a team to achieve common goal.</p> <p>CO6 Learn on their own, reflect on their learning and take appropriate actions to improve it.</p>
6	SEMINAR	17EES86	<p>CO1 Carry out literature survey, organize the Course topics in a systematic order.</p> <p>CO2 Prepare the report with own sentences.</p> <p>CO3 Type the matter to acquaint with the use of Micro-soft Equation and drawing tools or any such facilities.</p> <p>CO4 Present the seminar topic orally and/or through power point slides.</p> <p>CO5 Answer the queries and involve in debate/discussion.</p> <p>CO6 Submit typed report with a list of references</p>

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
Academic Year 2020-21

2015 SCHEME - COURSE OUTCOMES



2015 SCHEME -- 6TH SEMESTER

SL.	Subject Name	Subject	Course Outcomes(CO)
1	CONTROL SYSTEMS	15EE61	CO1 Describe the effects of feedback and types of feedback control systems
			CO2 Evaluate the transfer function of a linear time invariant system
			CO3 Evaluate the stability of linear time invariant systems
			CO4 Apply block diagram manipulation and signal flow graph methods to obtain transfer function of systems
			CO5 Demonstrate the knowledge of mathematical modeling of control systems and components
			CO6 Determine transient and steady state time response of a simple control system
			CO7 Investigate the performance of a given system in time and frequency domains
			CO8 Discuss stability analysis using Routh locus, Nyquist plots and Nichols plots
2	POWER SYSTEM ANALYSIS - I	15EE62	CO1 Show understanding of per unit system, its advantages and compensation
			CO2 Show the concept of one line diagram and its implementation in problems
			CO3 Perform short circuit analysis on a synchronous machine and simple power system to select a circuit breaker for the system
			CO4 Evaluate symmetrical components of voltages and currents in an balanced three phase circuit
			CO5 Explain the concept of sequence impedance and sequence networks of power system components and power system
			CO6 Analyze three phase synchronous machines and simple power systems for different unbalanced loads using symmetrical components
			CO7 Discuss the dynamics of synchronous machines, stability and types of stability
			CO8 Discuss equal area criterion for the evaluation of stability of a simple system under different fault conditions
3	DIGITAL SIGNAL PROCESSING	15EE63	CO1 Compute the DFT of various signals using its properties and linear filtering of two sequences
			CO2 Apply fast and efficient algorithms for computing DFT and inverse DFT of a given sequence
			CO3 Design infinite impulse response Butterworth digital filters using impulse invariant or bilinear transformation technique
			CO4 Design infinite impulse response Chebyshev digital filters using impulse invariant or bilinear transformation technique
			CO5 Realize a digital FIR filter by direct, cascade, parallel and ladder methods of realization
			CO6 Discuss different window functions and frequency sampling method used for design of FIR filters
			CO7 Design FIR filters by use of window function or by frequency sampling method
			CO8 Realize a digital FIR filter by direct, cascade, and lattice phase form
4	ELECTRICAL MACHINE DESIGN	15EE64	CO1 Discuss design factors, limitations, modern needs & designs, manufacturing of electrical machines and properties of materials used in the electrical machines
			CO2 Derive the output equations of transformer, DC machines and AC machines
			CO3 Discuss selection of specific loadings and magnetic circuits of different electrical machines
			CO4 Design the field windings of DC machine and Synchronous machine
			CO5 Design stator and rotor circuits of a DC and AC machines
			CO6 Estimate the number of cooling tubes, no load current and leakage reactance of core type transformer
			CO7 Discuss short circuit ratio and its effects on performance of synchronous machines
			CO8 Design salient pole and non-salient pole alternators for given specifications
5	COMPUTER AIDED ELECTRICAL DRAWING I (Professional Elective)	15EE651	CO1 Discuss the terminology and types of DC and AC armature windings
			CO2 Develop armature winding diagrams for DC and AC machines
			CO3 Develop a layout for substation using the standard symbols for substation equipment
			CO4 Draw sectional views of core and shell types transforms illustrating the design data
			CO5 Draw sectional views of assembled DC machine or its parts using the design data or the sketches
			CO6 Draw sectional views of assembled alternator or its parts using the design data or the sketches

4 INTERNSHIP / PROFESSIONAL PRACTICE	15EE84	C03 Apply knowledge and skills learned in classroom work. C04 Develop a greater understanding about career options while more clearly defining personal career goals C05 Experience the activities and functions of professionals C06 Develop and refine oral and written communication skills C07 Identify ways for future knowledge and skill development. C08 Expand intellectual capacity, creativity, judgment, intuition C09 Acquire the knowledge of administration, marketing, finance and economics
5 PROJECT WORK PHASE -II	15EEP85	C01 Present the project and be able to defend it. C02 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. C03 Elaborated to critical thinking and use problem solving skills C04 Communicate effectively and to present ideas clearly and coherently in both the written and oral forms C05 Work in a team to achieve common goal. C06 Learn on their own, reflect on their learning and take appropriate actions to improve it.
6 SEMINAR	15EES86	C01 Carryout literature survey, organise the Course topics in a systematic order. C02 Prepare the report with own research. C03 Type the matter to acquaint with the use of Micro-soft equation and drawing tools or any such facilities. C04 Present the seminar topic orally and/or through power point slides. C05 Answer the queries and involve in detailed discussion. C06 Submit typed report with a list of references.

8/12/2021
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Don Bosco Institute of Technology, Bangalore
 (NAAC Accredited Institution)
Department of Mechanical Engineering
 (Accredited by NBA)



COs 2020-21 Even Semester

Sl. No	Subject Name	Subject Code	2018 scheme COURSE OUTCOMES 4th SEM				
			Course Outcomes(CO)				
1	COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS	18MAT41	CO1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.			
			CO2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.			
			CO3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.			
			CO4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.			
			CO5	Construct joint probability distributions and demonstrate the validity of testing the			
2	APPLIED THERMODYNAMICS	18ME42	CO1	Apply thermodynamic concepts to analyze the performance of gas power cycles			
			CO2	Apply thermodynamic concepts to analyze the performance of vapour power cycles			
			CO3	Understand combustion of fuels and performance of IC engines			
			CO4	Understand the principles and applications of refrigeration systems			
			CO5	Apply Thermodynamic concepts to determine performance parameters of refrigeration and airconditioning systems.			
3	FLUID MECHANICS	18ME43	CO1	Identify and calculate the key fluid properties used in the analysis of fluid behavior			
			CO2	Explain the principles of pressure, buoyancy and floatation			
			CO3	Apply the knowledge of fluid statics, kinematics and dynamics while addressing problems of mechanical and chemical engineering			
			CO4	Describe the principles of fluid kinematics and dynamics			
			CO5	Explain the concept of boundary layer in fluid flow and apply dimensional analysis to			
4	KINEMATICS OF MACHINES	18ME44	CO1	Knowledge of mechanisms and their motion			
			CO2	Understand the inversions of four bar mechanisms			
			CO3	Analyse the velocity, acceleration of links and joints of mechanisms			
			CO4	Analysis of cam follower motion for the motion specifications.			
			CO5	Understand the working of the spur gears.			

		SUBJECT Code	Course Outcomes(CO)
5	METAL CASTING AND WELDING	18ME45B	<p>CO1 Describe the casting process and prepare different types of cast products</p> <p>CO2 Acquire knowledge on Pattern, Core, Gating, Riser system and to use Jolt, Squeeze, Sand Slinger Moulding machines</p> <p>CO3 Compare the Gas fired pit, Resistance, Coreless, Electrical and Cupola Metal Furnaces</p> <p>CO4 Compare the Gravity, Pressure die, Centrifugal, Squeeze, slush and Continuous Metal mold castings. Describe the Metal Arc, TIG, MIG, Submerged and Atomic Hydrogen Welding processes etc. used in manufacturing</p>
6	MECHANICAL MEASUREMENTS AND METROLOGY	18ME46B	<p>CO1 Understand the objectives of metrology, methods of measurement, standards of measurement & various measurement parameters</p> <p>CO2 Explain tolerance, limits of size, fits, geometric and position tolerances, gauges and their applications</p> <p>CO3 Understand the working principle of different types of comparators</p> <p>CO4 Describe measurement of major & minor diameter, pitch, angle and effective diameter of screw threads.</p>
7	MECHANICAL MEASUREMENTS AND METROLOGY LAB	18MEL47B	<p>CO1 Understand Calibration of pressure gauge, thermocouple, LVDT, load cell, micrometer</p> <p>CO2 Apply concepts of Measurement of angle using Sine Centre/ Sine Bar/ Bevel Protractor</p> <p>CO3 Apply concepts of Measurement of angle using Sine Centre/ Sine Bar/ Bevel Protractor</p> <p>CO4 Analyse tool forces using Lathe/Drill tool dynamometer</p>
8	WORKSHOP AND MACHINE SHOP PRACTICE	18MEL48A	<p>CO1 To read working drawings, understand operational symbols and execute machining operations</p> <p>CO2 Prepare fitting models according to drawings using hand tools- V-block, marking gauge, files, hack saw, drills etc</p> <p>CO3 Understand integral parts of lathe, shaping and milling machines and various accessories and attachments used</p> <p>CO4 Select cutting parameters like cutting speed, feed, depth of cut, and tooling for various 2018 scheme COURSE OUTCOMES of 6th SEM</p>
9	FINITE ELEMENT ANALYSIS	18ME61	<p>CO1 To learn basic principles of finite element analysis procedure</p> <p>CO2 To learn the theory and characteristics of finite elements that represent engineering structures</p> <p>CO3 To learn and apply finite element solutions to structural, thermal, dynamic problem to develop the knowledge and skills needed to effectively evaluate finite element analyses</p>

	Subject Name	Subject Code	Course Outcomes(CO)
2	Computer Integrated Manufacturing	18ME62	<p>CO1 To impart knowledge of CIM and Automation and different concepts of automation by developing mathematical models</p> <p>CO2 To make students to understand the Computer Applications in Design and Manufacturing (CAD / CAM) leading to Computer integrated systems. Enable them to perform various transformations of entities on display devices.</p> <p>CO3 To expose students to automated flow lines, assembly lines, Line Balancing Techniques, and Flexible Manufacturing Systems</p> <p>CO4 To expose students to computer aided process planning, material requirement planning, capacity planning etc.</p> <p>CO5 To introduce the students to concepts of Additive Manufacturing, Internet of Things, and Industry 4.0 leading to Smart Factory</p> <p>CO6 To expose the students to CNC Machine Tools, CNC part programming, and industrial robots.</p>
3	Heat Transfer	18ME63	<p>CO1 Study the modes of heat transfer.</p> <p>CO2 Learn how to formulate and solve 1-D steady and unsteady heat conduction problems</p> <p>CO3 Apply empirical correlations for fully-developed laminar, turbulent internal flows and external boundary layer convective flow problems</p> <p>CO4 Study the basic principles of heat exchanger analysis and thermal design</p> <p>CO5 Understand the principles of boiling and condensation including radiation heat transfer related engineering problems.</p>
4	DESIGN OF MACHINE ELEMENTS II	18ME64	<p>CO1 To understand various elements involved in a mechanical system.</p> <p>CO2 To analyze various forces acting on the elements of a mechanical system and design them using appropriate techniques, codes, and standards.</p> <p>CO3 To select transmission elements like gears, belts, pulleys, bearings from the manufacturers' catalogue.</p> <p>CO4 To design completely a mechanical system integrating machine elements.</p> <p>CO5 To produce assembly and working drawings of various mechanical systems involving machine elements like belts, pulleys, gears, springs, bearings, clutches and brakes.</p>
5	NON-TRADITIONAL MACHINING	18ME64I	<p>CO1 Understand the compare traditional and non-traditional machining process and recognize the need for Non- traditional machining process.</p> <p>CO2 Understand the constructional features, performance parameters, process characteristics, applications, advantages and limitations of USM, AIM and WJM</p> <p>CO3 Identify the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process characteristics, applications, advantages and limitations</p> <p>CO4 Understand the constructional feature of the equipment, process parameters, process characteristics, applications, advantages and limitations EDM & PAM</p> <p>CO5 Understand the LBM equipment, LBM parameters, and characteristics. EBM equipment and mechanism of metal removal, applications, advantages and limitations LBM & EBM.</p>

Subject Code	Course Outcomes(CO)
2 Computer Integrated Manufacturing	<p>CO1 Able to define Automation, CIM, CAD, CAM and explain the differences between these concepts. Visualize and appreciate the modern trends in Manufacturing like additive manufacturing, Industry 4.0 and applications of Internet of Things leading to Smart Manufacturing</p> <p>CO2 Solve simple problems of transformations of entities on computer screen.</p> <p>CO3 Explain the basics of automated manufacturing industries through mathematical models and analyze different types of automated flow lines</p> <p>CO4 Analyze the automated flow lines to reduce down time and enhance productivity</p>
3 Heat Transfer	<p>CO1 Understand the basic modes of heat transfer and Design heat exchangers using LMTD and NTT methods</p> <p>CO2 Compute temperature distribution in steady-state and unsteady-state heat conduction</p> <p>CO3 Understand and interpret heat transfer through extended surfaces</p> <p>CO4 Interpret and compute forced and free convective heat transfer</p> <p>CO5 Explain the principles of radiation heat transfer and understand the numerical formula for heat conduction problems.</p>
4 DESIGN OF MACHINE ELEMENTS II	<p>CO1 Apply engineering design tools to product design. Become good design engineers through learning the art of working in a team with morality and ethics</p> <p>CO2 Design mechanical systems involving springs, belts and pulleys. Design different types of gears and simple gear boxes for different applications</p> <p>CO3 Design brakes and clutches. Design hydrodynamic bearings for different applications. Select Anti friction bearings for different applications using the manufacturers' catalogue</p> <p>CO4 Develop proficiency to generate production drawings using CAD software</p> <p>CO5 Become good design engineers through learning the art of working in a team with</p> <p>CO1 Explain the various approaches of TQM</p> <p>CO2 Infer the customer perception of quality</p> <p>CO3 Analyze customer needs and perceptions to design feedback systems</p> <p>CO4 Apply statistical tools for continuous improvement of systems</p> <p>CO5 Apply the tools and technique for effective implementation of TQM</p>
5 TOTAL QUALITY MANAGEMENT	<p>CO1 To identify the different parts of an automobile and it's working</p> <p>CO2 To understand the working of transmission and braking systems</p> <p>CO3 To comprehend the working of steering and suspension systems</p> <p>CO4 To learn various types of fuels and injection systems</p>
6 AUTOMOBILE ENGINEERING	<p>CO5 To know the cause of automobile emissions, its effects on environment and methods to reduce the emissions</p>

Sl. No	Subject Name	Subject Code	Course Outcomes(CO)
6	WORLD CLASS MANUFACTURING	18MIE652	<p>CO1 Understand recent trends in manufacturing.</p> <p>CO2 Demonstrate the relevance and basics of World Class Manufacturing.</p> <p>CO3 Understand customization of product for manufacturing.</p> <p>CO4 Understand the implementation of new technologies.</p> <p>CO5 Compare the existing industries with WCM industries.</p>
7	HEAT TRANSFER LAB	18MEL67	<p>CO1 Determine the thermal conductivity of a metal rod and overall heat transfer coefficient of composite slabs.</p> <p>CO2 Determine convective heat transfer coefficient for free and forced convection and correlate with theoretical values.</p> <p>CO3 Evaluate temperature distribution characteristics of steady and transient heat conduction through solid cylinder experimentally.</p> <p>CO4 Determine surface emissivity of a test plate and Stefan Boltzmann constant.</p> <p>CO5 Estimate performance of a refrigerator and effectiveness of a fin and Double pipe heat exchanger.</p>
8	COMPUTER AIDED MODELLING AND ANALYSIS LAB	18MEL66	<p>CO1 Use the modern tools to formulate the problem, create geometry, descretize, apply boundary conditions to solve problems of bars, truss, beams, and plate to find stresses with different-loading conditions.</p> <p>CO2 Demonstrate the ability to obtain deflection of beams subjected to point, uniformly distributed and varying loads and use the available results to draw shear force and bending moment diagrams.</p> <p>CO3 Analyze and solve 1D and 2D heat transfer conduction and convection problems with different boundary conditions.</p> <p>CO4 Carry out dynamic analysis and finding natural frequencies of beams, plates, and bars for various boundary conditions and also carry out dynamic analysis with forcing functions.</p>
2017 scheme COURSE OUTCOMES 6th SEM			
Sl. No	Subject Name	Subject Code	6th sem Course Outcomes(CO)
1	FINITE ELEMENT ANALYSIS	17MIE61	<p>CO1 Understand the concepts behind formulation methods in FEM.</p> <p>CO2 Identify the application and characteristics of FEA elements such as bars, beams, plane circular shafts, heat transfer, fluid flow, axi symmetric and dynamic problems and solve them displacements, stress and strains induced.</p> <p>CO3 Develop element characteristic equation and generation of global equation.</p>

Sl. No	Subject Name	Subject Code	Course Outcomes(CO)
7	Heat Transfer Lab	17MEL67	CO1 Perform experiments to determine the thermal conductivity of a metal rod
			CO2 Conduct experiments to determine convective heat transfer coefficient for free and forced convection and correlate with theoretical values
			CO3 Estimate the effective thermal resistance in composite slabs and efficiency in pin-fin and surface emissivity of a test plate
			CO4 Estimate performance of a refrigerator and effectiveness of fin
			CO5 Calculate temperature distribution of steady and transient heat conduction through plane wall, cylinder and fin using numerical approach
8	Modeling and Analysis Lab (FEA)	17MEL68	CO1 Demonstrate the basic features of an analysis package
			CO2 apply boundary condition to solve problems of bars, truss, beams, plate to find stress with loads
			CO3 further to use the available results to draw shear force and bending moment diagrams
			CO4 2D heat transfer with conduction and convection boundary conditions
			CO5 Carry out dynamic analysis and finding natural frequencies for various boundary conditions and also analyze with forcing function
2015 scheme COURSE OUTCOMES 6th SEM			
Sl. No	Subject Name	Subject Code	6th sem Course Outcomes(CO)
1	FINITE ELEMENT ANALYSIS	15ME61	CO1 Understand the concepts behind formulation methods in FEM
			CO2 Identify the application and characteristics of FEA elements such as bars, beams, plane and iso-parametric elements
			CO3 Develop element characteristic equation and generation of global equation
			CO4 Able to apply suitable boundary conditions to a global equation for bars, trusses, beams, circular shafts, heat transfer, fluid flow, axisymmetric and dynamic problems and solve them displacements, stress and strains induced
2	Computer Integrated Manufacturing	15ME62	CO1 Able to define Automation, CIM, CAD, CAM and explain the differences between these concepts. Visualize and appreciate the modern trends in Manufacturing like additive manufacturing, Industry 4.0 and applications of Internet of Things leading to Smart Manufacturing
			CO2 Solve simple problems of transformations of entities on computer screen
			CO3 Explain the basics of automated manufacturing industries through mathematical models and analyze different types of automated flow lines
			CO4 Analyze the automated flow lines to reduce down time and enhance productivity
			CO5 Explain the use of different computer applications in manufacturing, and able to prepare part programs for simple jobs on CNC machine tools and robot programming

Subject Name	Subject Code	Course Outcomes(CO)
Heat Transfer	15ME63	CO1 Understand the basic modes of heat transfer and Design heat exchangers using LMTD and NTU methods
		CO2 Compute temperature distribution in steady-state and unsteady-state heat conduction
		CO3 Understand and interpret heat transfer through extended surfaces.
		CO4 Interpret and compute forced and free convective heat transfer.
		CO5 Explain the principles of radiation heat transfer and understand the numerical formula for heat conduction problems
DESIGN OF MACHINE ELEMENTS II	15ME64	CO1 Apply engineering design tools to product design. Become good design engineers through learning the art of working in a team with morality and ethics.
		CO2 Design mechanical systems involving springs, belts and pulleys. Design different types of gears and simple gear boxes for different applications
		CO3 Design brakes and clutches. Design hydrodynamic bearings for different applications. Select Anti friction bearings for different applications using the manufacturers' catalogue
		CO4 Develop proficiency to generate production drawings using CAD software
		CO5 Become good design engineers through learning the art of working in a team with morality and ethics.
TOTAL QUALITY MANAGEMENT	15ME664	CO1 Explain the various approaches of TQM
		CO2 Infer the customer perception of quality
		CO3 Analyze customer needs and perceptions to design feedback systems
		CO4 Apply statistical tools for continuous improvement of systems
		CO5 Apply the tools and technique for effective implementation of TQM
AUTOMOBILE ENGINEERING	15ME655	CO1 To identify the different parts of an automobile and its working
		CO2 To understand the working of transmission and braking systems
		CO3 To comprehend the working of steering and suspension systems
		CO4 To learn various types of fuels and injection systems
		CO5 To know the cause of automobile emissions, its effects on environment and methods to reduce the emissions
Heat Transfer Lab	15MEL67	CO1 Perform experiments to determine the thermal conductivity of a metal rod
		CO2 Conduct experiments to determine convective heat transfer coefficient for free and forced convection and correlate with theoretical values
		CO3 Estimate the effective thermal resistance in composite slabs and efficiency in pin-fin and surface emissivity of a test plate
		CO4 Estimate performance of a refrigerator and effectiveness of fin
		CO5 Calculate temperature distribution of steady and transient heat conduction through plane wall, cylinder and fin using numerical approach

Subject Name	Subject Code	Course Outcomes(CO)		
		CO1	Demonstrate the basic features of an analysis package	
		CO2	Use the modern tools to formulate the problem, and able to create geometry, discretize, apply boundary condition to solve problems of bars, truss, beams, plate to find stress with different loading conditions	
Modeling and Analysis Lab (FEA)	15MEL68	CO3	loads further to use the available results to draw shear force and bending moment diagrams.	
		CO4	Analyze the given problem by applying basic principle to solve and demonstrate 1D and 2D heat transfer with conduction and convection boundary conditions	
		CO5	Carry out dynamic analysis and finding natural frequencies for various boundary conditions and also analyze with forcing function	
		2017 scheme COURSE OUTCOMES of 8th SEM		
1	Operations Research	17ME81	CO1	To enable the students to understand the scientific methods of providing various departments of an organization with a quantitative basis of decision making
		CO2	CO2 To enable the students to understand the importance of various tools and techniques in finding optimal solutions to problems involving limited resources in the form of Men, Materials and machinery.	
2	Additive Manufacturing	17ME82	CO1	Understand the additive manufacturing process, polymerization and powder metallurgy process
		CO2	Understand characterisation techniques in additive manufacturing	
		CO3	Acquire knowledge on CNC and Automation	
3	Product Life Cycle Management	17ME835	CO1	Explain the various strategies of PLM and Product Data Management
		CO2	Describe decomposition of product design and model simulation	
		CO3	Apply the concept of New Product Development and its structuring	
		CO4	Analyze the technological forecasting and the tools in the innovation	
		CO5	Apply the virtual product development and model analysis	
		2015 scheme COURSE OUTCOMES of 8th SEM		
Sl. No	Subject Name	Subject Code	2015 scheme 8th SEM Course Outcomes(CO)	
1	Operations Research	15ME81	CO1	Understand the meaning, definitions, scope, need, phases and techniques of operations research
		CO2	Formulate as L.P.P and derive optimal solutions to linear programming problems by graphical method, Simplex method, Big-M method and Dual Simplex method	
		CO3	Formulate as Transportation and Assignment problems and derive optimum solutions for transportation, Assignment and travelling salesman problems.	
		CO4	Solve problems on game theory for pure and mixed strategy under competitive environment, Solve waiting line problems for M/M/1 and M/M/K queuing models	
		CO5	Construct network diagrams and determine critical path, floats for deterministic and PERT networks including crashing of Networks, Determine minimum processing times for sequencing of n jobs-2 machines, n jobs-3 machines,n jobs-n machines and 2 jobs-n machines using Johnson's algorithm.	

Subject Name	Subject Code	Course Outcomes(CO)
Additive Manufacturing	15MEE82	<p>CO1 Understand the different process of Additive Manufacturing using Polymer, Powder and Nano materials manufacturing</p> <p>CO2 Analyse the different characterization techniques.</p> <p>CO3 Describe the various NC, CNC machine programming and Automation techniques</p>
Product Life Cycle Management	15MEE835	<p>CO1 Explain the various strategies of PLM and Product Data Management</p> <p>CO2 Describe decomposition of product design and model simulation</p> <p>CO3 Apply the concept of New Product Development and its structuring</p> <p>CO4 Analyze the technological forecasting and the tools in the innovation</p> <p>CO5 Apply the virtual product development and model analysis</p>

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DEPARTMENT OF CIVIL ENGINEERING

COURSE OUTCOMES

Sl. No.	Subject Name	Subject Code	Course Outcomes(CO)
1	Complex Analysis, Probability And Statistical Methods	ISMAT41	CO1 Apply concepts of complex numbers and vector algebra to analyze the problems arising in related area.
			CO2 Utilize conformal transformation and complex integral arising in aerosol theory, fluid flow visualization and image processing.
			CO3 Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
			CO4 Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
			CO5 Construct joint probability distributions and demonstrate the validity of testing the hypothesis.
2	Analysis of Determinate Structures	18CV42	CO1 Identify different forms of structural systems
			CO2 Construct 2D and analyse the beams and trusses subjected to moving loads
			CO3 Understand the energy principles and energy theorems and its applications to determine the deflections of trusses and beams.
			CO4 Determine the stress resultants in arches and cables
3	Applied Hydraulics	18CV43	CO1 Apply dimensional analysis to develop mathematical modeling and compute the parametric values in prototype by analyzing the corresponding model parameters
			CO2 Design the open channels of various cross sections including economical channel sections
			CO3 Apply Energy concepts to flow in open channel sections, Calculate Energy dissipation
			CO4 Compute water surface profiles at different conditions
			CO5 Design turbines for the given data, and to know their operation characteristics under different operating conditions
4	Concrete Technology	18CV44	CO1 Relate material characteristics and their influence on microstructure of concrete.
			CO2 Distinguish concrete behavior based on its fresh and hardened properties.
			CO3 Illustrate proportioning of different types of concrete mixes for required fresh and hardened properties using professional codes.
			CO4 Adapt suitable concreting methods to place the concrete based on requirements.
			CO5 Select a suitable type of concrete based on specific application.

SL. No	Subject Name	Subject Code	Course Outcomes(CO)
5	Advanced Surveying	18CV45	CO1 Apply the knowledge of geometric principles to arrive at surveying problems
			CO2 Use modern instruments to obtain geo-spatial data and analyse the same to appropriate engineering problems
			CO3 Capture geodetic data to process and perform analysis for survey problems with the use of electronic instruments
			CO4 Design and implement the different types of curves for deviating type of alignments
6	Water Supply & Treatment Engineering	18CV46	CO1 Estimate average and peak water demand for a community
			CO2 Evaluate available sources of water, quantitatively and qualitatively and make appropriate choice for a community
			CO3 Evaluate water quality and environmental significance of various parameters and plan suitable treatment system
			CO4 Design a comprehensive water treatment and distribution system to purify and distribute water to the required quality standards
7	Engineering Geology Laboratory	18CVL47	CO1 The students able to identify the minerals, rocks and utilize them effectively in civil engineering practices
			CO2 The students will interpret and understand the geological conditions of the area for implementation of civil engineering projects
			CO3 The students will interpret subsurface information such as thickness of soil, weathered zone, depth of hard rock and saturated zone by using geophysical methods.
			CO4 The students will learn the techniques in the interpretation of LANDSAT Imageries to find out the lineaments and other structural features for the given area
			CO5 The students will be able to identify the different structures in the field
8	Fluid Mechanics and Hydraulic Machines Laboratory	18CVL48	CO1 Properties of fluids and the use of various instruments for fluid flow measurement
			CO2 Working of hydraulic machines under various conditions of working and their characteristics

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DEPARTMENT OF CIVIL ENGINEERING

COURSE OUTCOMES

6TH SEM

Sl. No.	Subject Name	Subject Code	Course Outcomes(CO)
1	DESIGN OF STEEL STRUCTURAL ELEMENTS	18CV61	CO1 Possess a knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code provisions and plastic behaviour of structural steel
			CO2 Understand the Concept of Bolted and Welded connections.
			CO3 Understand the Concept of Design of compression members, built-up columns and columns splices.
			CO4 Understand the Concept of Design of tension members, simple slab base and gusseted base.
			CO5 Understand the Concept of Design of laterally supported and un-supported steel beams.
2	APPLIED GEOTECHNICAL ENGINEERING	18CV62	CO1 Ability to plan and execute geotechnical site investigation program for different civil engineering projects
			CO2 Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
			CO3 Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures.
			CO4 Ability to determine bearing capacity of soil and achieve proficiency in preparing shallow isolated and
			CO5 Capable of estimating load carrying capacity of single and group of piles
3	DESIGN OF STEEL STRUCTURAL ELEMENTS	18CV61	CO1 Possess a knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code provisions and plastic behaviour of structural steel
			CO2 Understand the Concept of Bolted and Welded connections.
			CO3 Understand the Concept of Design of compression members, built-up columns and columns splices.
			CO4 Understand the Concept of Design of tension members, simple slab base and gusseted base.
			CO5 Understand the Concept of Design of laterally supported and un-supported steel beams.
4	HYDROLOGY AND IRRIGATION ENGINEERING	18CV63	CO1 Understand the importance of hydrology and its components
			CO2 Measure precipitation and analyze the data and analyze the losses in precipitation
			CO3 Estimate runoff and develop unit hydrograph
			CO4 Find the benefits and ill-effects of irrigation
			CO5 Find the quantity of irrigation water and frequency of irrigation for various crops.
			CO6 Find the canal capacity, design the canal and compute the reservoir capacity.

SL No	Subject Name	Subject Code	Course Outcomes(CO)
5	GROUND IMPROVEMENT TECHNIQUES	18CV644	CO1 Give solutions to solve various problems associated with soil formations having less strength.
			CO2 Use effectively the various methods of ground improvement techniques depending upon the requirements.
			CO3 utilize properly the locally available materials and techniques for ground improvement so that economy
6	WORLD CLASS MANUFACTURING	18CV652	CO1 Understand recent trends in manufacturing.
			CO2 Demonstrate the relevance and basics of World Class Manufacturing.
			CO3 Understand customization of product for manufacturing
			CO4 Understand the implementation of new technologies.
			CO5 Compare the existing industries with WCM industries.
7	SOFTWARE APPLICATION LAB	18CVL66	After studying this course, students will be able to: use software skills in a professional set up to automate the work and thereby reduce cycle time for completion of the work
8	ENVIRONMENTAL ENGINEERING LABORATORY	18CVL67	CO1 Acquire capability to conduct experiments and estimate the concentration of different parameters.
			CO2 Compare the result with standards and discuss based on the purpose of analysis.
			CO3 Determine type of treatment, degree of treatment for water and waste water.
			CO4 Identify the parameter to be analyzed for the student project work in environmental stream.
9	EXTENSIVE SURVEY PROJECT	18CVER68	CO1 Apply Surveying knowledge and tools effectively for the projects
			CO2 Understanding Task environment, Goals, responsibilities, Task focus, working in Teams towards common goals, Organizational performance expectations, technical and behavioral competencies
			CO3 Application of individual effectiveness skills in team and organizational context, goal setting, time management, communication and presentation skills.
			CO4 Professional etiquettes at workplace, meeting and general
			CO5 Establishing trust based relationships in teams & organizational environment
			CO6 Orientation towards conflicts in team and organizational environment, Understanding sources of conflicts, Conflict resolution styles and techniques.

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DEPARTMENT OF CIVIL ENGINEERING
COURSE OUTCOMES

8th sem

Sl. No	Subject Name	Subject Code	Course Outcomes(CO)
1	Quantity Surveying and Contracts Management	15CV81	CO1 Prepare detailed and abstract estimates for roads and building.
			CO2 Prepare valuation reports of buildings
			CO3 Interpret Contract document's of domestic and international construction works
2	Design of Pre Stressed Concrete Elements	15CV82	CO1 After studying this course, students will be able to: 1. Understand the requirement of PSC members for present scenario.
			CO2 Analyse the stresses encountered in PSC element during transfer and at working.
			CO3 Understand the effectiveness of the design of PSC after studying losses
			CO4 Capable of analyzing the PSC element and finding its efficiency.
			CO5 Design PSC beam for different requirements.
3	Pavement Design	15CV833	CO1 Systematically generate and compile required data's for design of pavement (Highway & Airfield).
			CO2 Analyze stress, strain and deflection by boussinesq's, burmister's and westergaard's theory.
			CO3 Design rigid pavement and flexible pavement conforming to IRC58-2002 and IRC37-2001.
			CO4 Evaluate the performance of the pavement and also develops maintenance statement based on site specific



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DEPARTMENT OF CIVIL ENGINEERING

COURSE OUTCOMES

8th sem

SL. No	Subject Name	Subject Code	Course Outcomes(CO)
1	Quantity Surveying and Contracts Management	17CV81	<p>CO1 Prepare detailed and abstract estimates for roads and buildings.</p> <p>CO2 Prepare valuation reports of buildings</p> <p>CO3 Interpret Contract document's of domestic and international construction works</p> <p>CO4 After studying this course, students will be able to: 1. Understand the requirement of PSC members for present scenario.</p>
2	Design of Pre Stressed Concrete Elements	17CV82	<p>CO2 Analyse the stresses encountered in PSC element during transfer and at working.</p> <p>CO3 Understand the effectiveness of the design of PSC after studying losses</p> <p>CO4 Capable of analyzing the PSC element and finding its efficiency.</p> <p>CO5 Design PSC beam for different requirements.</p>
3	Pavement Design	17CV833	<p>CO1 Systematically generate and compile required data's for design of pavement (Highway & Airfield).</p> <p>CO2 Analyze stress, strain and deflection by boussinesq's, burmister's and westergaard's theory.</p> <p>CO3 Design rigid pavement and flexible pavement conforming to IRC:SS-2002 and IRC:37-2001.</p> <p>CO4 Evaluate the performance of the pavement and also develops maintenance statement based on site specific requirements.</p>

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COURSE OUTCOMES (2020-21)

I SEM 2020 SCHEME

1	Human Resource Management	2MBA21	CO1 Gain political experience in the field of Human Resource Concepts, functions and theories. CO2 Acquire the conceptual insight of Human Resource and various functions of HR. CO3 Apply personnel management and welfare aspects of HR. CO4 Develop a greater understanding about HR practices, analyze the trends in the field of HR. CO5 Understand the basic financial concepts.
2	Financial Management	2MBA22	CO1 Understand the basic financial concepts. CO2 Apply time value of money. CO3 Evaluate the investment decisions. CO4 Estimate working capital requirements. CO5 Analyze the capital structure and dividend decisions.
3	Research Methodology	2MBA23	CO1 Understand various research approaches, techniques and strategies in the appropriate in business. CO2 Apply a range of quantitative / qualitative research techniques in business and day to day management problems. CO3 Demonstrate knowledge and understanding of data analysis, interpretation and report writing. CO4 Develop necessary critical thinking skills in order to evaluate different research approaches in Business using excel in particular.
4	Operations Research	2MBA24	CO1 Get an insight into the fundamentals of Operations Research and its definition, characteristics and phases CO2 Use appropriate quantitative techniques to get feasible and optimal solutions CO3 Understand the usage of game theory, Queuing Theory and Simulation for Solving Business Problems CO4 Understand and apply the network diagram for project completion
5	Strategic Management	2MBA25	CO1 Students should get clear idea about the concept of Strategic Management, its relevance, Characteristics, process nature and purpose CO2 Students to acquire an understanding of how firms successfully institutionalize a strategy and create an organisational structure for domestic and overseas operations CO3 To give the students an insight on strategy at different levels of an organization to gain competitive advantage. CO4 To help students understand the strategic drive in multinational firms and their decisions in different markets CO5 To enable the students to gain knowledge of strategy implementation and the control measures for effective decisionmaking CO1 Display keen interest and orientation towards creative leadership, entrepreneurial opportunity Modules' in order to setup a business and to think creatively CO2 To know about the various business models and B-Pills across Business sectors CO3 Able to understand the importance of marketing and different forms of businesses CO4 Become aware about various sources of funding and institutions supporting entrepreneurs
6	Entrepreneurship and Legal Aspects	2MBA26	CO1 Awareness about legal aspects and ways to protect their ideas CO2 To understand the ways of starting a company and to know how to protect their ideas

20/05/2020

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Head of Department

MBA Department

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15-5-2020



DON BOSCO INSTITUTE OF TECHNOLOGY, BANGALORE-78
Department of Management Studies and Research



COURSE OUTCOMES (2020-21)
of THE DEGREE

Sl. No.	Subject Name	Subject Code	Course Outcomes (C)			
			C01	C02	C03	C04
1	Sales Management	18MBAADM401	Understand the apply the selling techniques in an organization.	Develop a plan for requesting, setting & taking sales force.	Organise sales territories to increase selling effectiveness.	Evaluate sales management strategies.
2	Integrated Marketing Communication	18MBAADM402	Define and apply knowledge of various aspects of managerial decision making related to marketing communications strategy and tactics.	Ability to create an integrated marketing communication plan which include promotional strategies.	Explain the role of IMC in the overall marketing & Use effectiveness measures to evaluate IMC strategies.	Project advertising copy and design other basic IMC tools.
3	Digital and Social Marketing	18MBAADM403	Recognise appropriate marketing objectives.	Appreciate the e-commerce framework and technology.	Illustrate the use of search engine marketing, online advertising and marketing strategies.	Use social media & create samples.
4	Strategic Brand Management	18MBAADM404	Develop social media strategy's to solve business problems.	Develop skills for managing brands strategically.	Compare and contrast the elements of product and brand management.	Assess growth opportunities for brands, e.g., brand extension strategies.
5	Rural Marketing	18MBAADM405	Outline the different needs of rural areas.	Highlight the characteristics of Indian rural markets and describe the differences between rural and the urban economy.	Analyse the tendencies of Indian rural market and advocate solutions for the problems of rural markets.	Explain the different strategies adopted by Indian companies for rural markets.
6	International Marketing Management	18MBAADM406	Be aware of the differences between domestic marketing and international marketing.	Understand International marketing Strategies.	Note down the import-export documentation.	
7	Mergers, Acquisitions and Corporate	18MBAFM401	Understand M&A within different classifications, strategies, themes, synergy etc.	Conduct financial evaluation of M&A.	Analyse the results after evaluation.	Critically evaluate different types of M&A, takeover and anti-takeover strategies.
8	Risk Management and Insurance	18MBAFM402	Understand various types of risks.	Analyze the process of identifying and measuring the risk.	Acquire with the functioning of life insurance in risk management.	Understand general insurance contract.
9	Indirect Taxation	18MBAFM403	Have clarity about GST laws in India.	Understanding of levy and collection of GST in India.	Have an overview of customs duty in India.	Understanding of valuation for customs duty.
10	International Financial Management	18MBAFM404	The student will have an understanding of the International Financial Environment.	The student will learn about the foreign exchange market, participants and transactions.	The student will be able to use derivatives in foreign exchange risk management.	The student will be able to evaluate the firm's exposure to risk in international environment and various theories associated with it.
11	Financial Derivative	18MBAFM405	Understand the mechanism of forward/futures, options, Financial swaps, various credit derivatives and VaR with their features, merits and demerits.	Understand the application of forward/futures, options, financial swaps, various credit derivatives and VaR using numerical problems.	Assess the application of forward/futures, options, financial swaps, various credit derivatives and VaR using numerical problems.	Application of financial derivatives in risk management.



DON BOSCO INSTITUTE OF TECHNOLOGY, BANGALORE
DEPARTMENT OF TELE COMMUNICATION ENGINEERING
Course Outcomes AY 2020-21 (EVEN Semester)

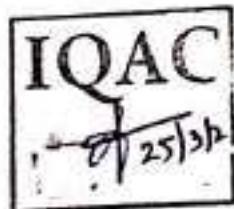


4th SEM (2018 scheme)

Sl. No.	Subject Name	Subject Code	Course Outcomes(CO)				
1	Complex Analysis, Probability and statistical methods	18MAT41	CO1	1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory electromagnetic field theory communication, planning, analysis, design, construction, and deployment.		
			CO2	2	Utilize conformal transformation and complex integral arising in aerofield theory, fluid flow visualization and image processing		
			CO3	3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field		
			CO4	4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data		
			CO5	5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis		
2	Analog Circuits	18EC42	CO1	1	Understand the characteristics of BJT's and FET's		
			CO2	2	Design and analyze BJT and FET amplifier circuits		
			CO3	3	Design sinusoidal and non-sinusoidal oscillators		
			CO4	4	Understand the functioning of linear ICs		
			CO5	5	Design of Linear IC based circuits		
3	Control Systems	18EC43	CO1	1	Develop the mathematical model of mechanical and electrical systems		
			CO2	2	Develop transfer function for a given control system using block diagram reduction techniques and signal flow graph method		
			CO3	3	Determine the time domain specification's for first and second order systems		
			CO4	4	Determine the stability of a system in the time domain using Routh-Hurwitz criterion and Root-locus technique		
			CO5	5	Determine the stability of a system in the frequency domain using Nyquist and bode plots		
4	Engineering Statistics and Linear Algebra	18EC44	CO1	1	Identify and associate Random Variables and Random Processes in Communication events		
			CO2	2	Analyze and model the Random events in typical communication events to extract quantitative statistical parameters		
			CO3	3	Analyze and model typical signal sets in terms of a basis function set of Amplitude, phase and frequency		
			CO4	4	Demonstrate by way of simulation or simulation the ease of analysis employing basis functions, statistical representation and Eigen values		
5	Signals and Systems	18EC45	CO1	1	Analyze the different types of signals and systems		
			CO2	2	Determine the linearity, causality, time-invariance and stability properties of continuous and discrete		
			CO3	3	Represent continuous and discrete systems in time and frequency domain using different transforms		
6	Microcontroller	18EC46	CO1	1	Explain the difference between Microprocessors & Microcontrollers, Architecture of 8051 Microcontroller, Interfacing of 8051 to external memory and instruction set of 8051		
			CO2	2	Write 8051 Assembly level programs using 8051 instruction set		
			CO3	3	Explain the interrupt system, operation of Timers/Counters and Serial port of 8051		
			CO4	4	Write 8051 Assembly language program to generate timings and waveforms using 8051 timers, to send & receive serial data using 8051 serial port and to generate an external interrupt using a switch		
			CO5	5	Write 8051 Assembly language programs to generate square wave on 8051 I/O port pin using interrupt and C Programme to send & receive serial data using 8051 serial port		
			CO6	6	Interface simple switches, simple LEDs, ADC 0804, LCD and Stepper Motor to 8051 using 8051 I/O		
7	Microprocessor And Microcontroller Laboratory	18ECL47	CO1	1	Write Assembly language programs in 8051 for solving simple problems that manipulate input data		
			CO2	2	Interface different input and output devices to 8051 and control them using Assembly language programs		
			CO3	3	Interface the serial devices to 8051 and do the serial transfer using C programming		
8	Analog circuits laboratory	18ECL48	CO1	1	Design analog circuits using BJT/FETs and evaluate their performance characteristics		
			CO2	2	Design analog circuits using OPAMPS for different applications		
			CO3	3	Simulate and analyse analog circuits that uses ICs for different electronic applications		

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DON BOSCO INSTITUTE OF TECHNOLOGY, BANGALORE
DEPARTMENT OF TELE COMMUNICATION ENGINEERING
Course Outcomes AY 2020-21 (EVEN Semester)



6th SEM(2018 scheme)

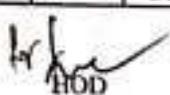
Sl No	Subject Name	Subject Code	Course Outcomes (CO)				
			CO1	CO2	CO3	CO4	CO5
1	Digital communication	18EC61	1. Associate and apply concepts of bandpass sampling to well specified signals and channels				
			CO2	2. Analyze and compute performance parameter and transfer rates for low pass and bandpass symbol under ideal and corrupted non band limited channels			
			CO3	3. Test and validate symbol processing and performance parameters at the receiver under ideal and corrupted bandlimited channels			
			CO4	4. Demonstrate the band pass signals subjected to corruption in a band limited channel can be processed at the receiver to meet specified performance criteria			
			CO5	5. Understand the principles of spread spectrum communication			
2	Microwave Theory and Antennas	18TE62	CO1	1. Describe the characteristics features of microwave tubes and basic parameters of antennas			
			CO2	2. Represent the multiport network in terms of S-parameters and analyze their properties			
			CO3	3. Understand the design concept of strip lines and microstrips			
			CO4	4. Analyze the features of antennas and antenna array			
			CO5	5. Recommend suitable antennas for various application			
3	Computer Communication Networks	18TE63	CO1	1. Understand the concepts of networking thoroughly			
			CO2	2. Identify the protocols and services of different layers			
			CO3	3. Distinguish the basic network configurations and standards associated with each network			
			CO4	4. Analyze performance of the network			
			CO5	5. Apply the knowledge in establishing computer based networks for real world problems			
4	Microcontroller and Embedded Systems	18EC644	CO1	1. Describe the architectural features and instructions of 32 bit microcontroller ARM cortex M3			
			CO2	2. Apply the knowledge gained for programming ARM cortex M3 for different application			
			CO3	3. Understand the basic hardware components and their selection method based on characteristics and attributes of an embedded system			
			CO4	4. Develop the hardware / software co-design and firmware design approaches			
			CO5	5. Explain the need of real time operating system for embedded system application			
5	Mobile Application Development	18CS651	CO1	1. Create, test and debug android application by setting up android development environment			
			CO2	2. Implement adaptive, responsive user interfaces that work across a wide range of devices			
			CO3	3. Infer long running tasks and background work in android application			
			CO4	4. Demonstrate methods in storing, sharing and retrieving data in android application			
			CO5	5. Analyze performance of android application and understand the role of permission and security			
6	CCN Laboratory	18TEL66	CO6	6. Describe the steps involved in publishing android application to share with the world			
			CO1	1. Use the network simulator			
			CO2	2. Design and simulate network elements with various protocols and standards			
			CO3	3. Model network for different configuration			
			CO4	4. Analyze the network performance			
7	Analog & Digital Communication Laboratory	18TEL67	CO5	5. Demonstrate the working of various protocols and algorithms using C programming			
			CO1	1. Demonstrate time division multiplexing			
			CO2	2. Design and test analog and digital modulation and demodulation circuits			
			CO3	3. Design and generate line codes for signal transmission			
			CO4	4. Analyze the characteristics of an optical communication systems			
			CO5	5. Simulate the digital communication concepts, compute and display various parameters along with plots/figures			

6th SEM (17 scheme)

No	Subject Name	Subject Code	Course Outcomes (CO)
1	Digital Communication	17EC61	CO1 1. Associate and apply the concepts of Bandpass sampling to well specified signals and channels.
			CO2 2. Analyze and compute performance parameters and transfer rates for low pass and bandpass symbol under ideal and corrupted non band limited channels.
			CO3 3. Test and validate symbol processing and performance parameters at the receiver under ideal and corrupted bandlimited channels.
			CO4 4. Demonstrate by simulation and emulation that bandpass signals subjected to corrupted and distorted symbols in a bandlimited channel, can be demodulated and estimated at receiver to meet specified performance criteria.
2	ARM MICROCONTROLLER & EMBEDDED SYSTEMS	17EC62	CO1 1. Describe the architectural features and instructions of 32 bit microcontroller ARM Cortex M3.
			CO2 2. Apply the knowledge gained for Programming ARM Cortex M3 for different applications.
			CO3 3. Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.
			CO4 4. Develop the hardware /software co-design and firmware design approaches. Explain the need of real time operating system for embedded system applications.
3	MICROWAVE AND ANTENNA	17TE63	CO1 1. Demonstrate understanding of MOS transistor theory, CMOS fabrication flow and technology scaling.
			CO2 2. Draw the basic gates using the stick and layout diagrams with the knowledge of physical design aspects.
			CO3 3. Interpret Memory elements along with timing considerations Demonstrate knowledge of FPGA based system design Interpret testing and testability issues in VLSI Design
			CO4 4. Analyze CMOS subsystems and architectural issues with the design constraints
4	COMPUTER COMMUNICATION NETWORK	17EC64	CO1 1. Identify the protocols and services of Data link layer.
			CO2 2. Identify the protocols and functions associated with the transport layer services.
			CO3 3. Describe the layering architecture of computer networks and distinguish between the OSI reference model and TCP/IP protocol suite.
			CO4 4. Distinguish the basic network configurations and standards associated with each network.
			CO5 5. Construct a network model and determine the routing of packets using different routing algorithms.
5	DIGITAL SWITCHING SYSTEMS	17EC654	CO1 1. Describe the electromechanical switching systems and its comparison with the digital switching.
			CO2 2. Determine the telecommunication traffic and its measurements
			CO3 3. Define the technologies associated with the data switching operations.
			CO4 4. Describe the software aspects of switching systems and its maintenance.
6	DIGITAL SYSTEM USING VERILOG	17EC663	CO1 1. Describe Verilog model for sequential circuits and test pattern generation. Design a semiconductor memory for specific chip design.
			CO2 2. Design embedded systems using small microcontrollers, larger CPUs/DSPs, or hard or soft processor cores.
			CO3 3. Synthesize different types of processor and I/O controllers that are used in embedded system
7	EMBEDDED CONTROLLER LAB	17ECL67	CO1 1. Understand the instruction set of 32 bit microcontroller ARM Cortex M3, and the software tool required for programming in Assembly and C language.
			CO2 2. Develop assembly language programs using ARM Cortex M3 for different applications.
			CO3 3. Interface external devices and I/O with ARM Cortex M3.
			CO4 4. Develop C language programs and library functions for embedded system applications.
8	MICROWAVE AND ANTENNA LAB	17TEL68	CO1 1. Demonstrate the performance and extract S-Parameters of various Microwave Components.
			CO2 2. Plot the Radiation Pattern and find the field Intensity, Polarization of a given Antenna Array
			CO3 3. Analyze and Measure Impedance of a given Microwave Component.
			CO4 4. Explain and Find Three Point method of obtaining equivalent Circuit Parameters & Dielectric Strength
			CO5 5. Prove Reciprocity Theorem as applied to Antennas

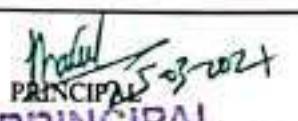
6th SEM (15 scheme)

Sl No.	Subject Name	Subject Code	Course Outcomes (CO)			
			CO1	CO2	CO3	CO4
1	Digital Communication	1SEC61	1. Associate and apply the concepts of Bandpass sampling to well specified signals and channels.			
			2. Analyze and compute performance parameters and transfer rates for low pas and bandpass symbol under ideal and corrupted non band limited channels.			
			3. Test and validate symbol processing and performance parameters at the receiver under ideal and corrupted bandlimited channels.			
			4. Demonstrate by simulation and emulation that bandpass signals subjected to corrupted and distorted symbols in a bandlimited channel, can be demodulated and estimated at receiver to meet specified performance criteria.			
2	ARM MICROCONTROLLER & EMBEDDED SYSTEMS	1SEC62	CO1	1. Describe the architectural features and instructions of 32 bit microcontroller ARM Cortex M3.		
			CO2	2. Apply the knowledge gained for Programming ARM Cortex M3 for different applications.		
			CO3	3. Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.		
			CO4	4. Develop the hardware /software co-design and firmware design approaches. Explain the need of real time operating system for embedded system applications.		
3	MICROWAVE AND ANTENNA	1STE63	CO1	1. Demonstrate understanding of MOS transistor theory, CMOS fabrication flow and technology scaling.		
			CO2	2. Draw the basic gates using the stick and layout diagrams with the knowledge of physical design aspects.		
			CO3	3. Interpret Memory elements along with timing considerations Demonstrate knowledge of FPGA based system design Interpret testing and testability issues in VLSI Design		
			CO4	4. Analyze CMOS subsystems and architectural issues with the design constraints		
4	COMPUTER COMMUNICATION NETWORK	1SEC64	CO1	1. Identify the protocols and services of Data link layer.		
			CO2	2. Identify the protocols and functions associated with the transport layer services.		
			CO3	3. Describe the layering architecture of computer networks and distinguish between the OSI reference model and TCP/IP protocol suite.		
			CO4	4. Distinguish the basic network configurations and standards associated with each network.		
			CO5	5. Construct a network model and determine the routing of packets using different routing algorithms.		
5	DIGITAL SWITCHING SYSTEMS	1SEC654	CO1	1. Describe the electromechanical switching systems and its comparison with the digital switching.		
			CO2	2. Determine the telecommunication traffic and its measurements		
			CO3	3. Define the technologies associated with the data switching operations.		
			CO4	4. Describe the software aspects of switching systems and its maintenance.		
6	DIGITAL SYSTEM USING VERILOG	1SEC663	CO1	1. Describe Verilog model for sequential circuits and test pattern generation. Design a semiconductor memory for specific chip design.		
			CO2	2. Design embedded systems using small microcontrollers, larger CPUs/DSPs, or hard or soft processor cores.		
			CO3	3. Synthesize different types of processor and I/O controllers that are used in embedded system		
			CO4			
7	EMBEDDED CONTROLLER LAB	1SEC167	CO1	1. Understand the instruction set of 32 bit microcontroller ARM Cortex M3, and the software tool required for programming in Assembly and C language		
			CO2	2. Develop assembly language programs using ARM Cortex M3 for different applications.		
			CO3	3. Interface external devices and I/O with ARM Cortex M3.		
			CO4	4. Develop C language programs and library functions for embedded system applications.		
8	MICROWAVE AND ANTENNA LAB	1TEL68	CO1	1. Demonstrate the performance and extract S-Parameters of various Microwave Components		
			CO2	2. Plot the Radiation Pattern and find the field Intensity, Polarization of a given Antenna/ Array		
			CO3	3. Analyze and Measure Impedance of a given Microwave Component.		
			CO4	4. Explain and Find Three Point method of obtaining equivalent Circuit Parameters & Dielectric		
			CO5	5. Prove Reciprocity Theorem as applied to Antennas		


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DON BOSCO INSTITUTE OF TECHNOLOGY, BANGALORE
DEPARTMENT OF TELE COMMUNICATION ENGINEERING
Course Outcomes AY 2020-21 EVEN Semester)

Sl No	Subject Name	Subject Code	8th SEM (17 scheme)
			Course Outcomes (CO)
1	Wireless Cellular and LTE	17EC81	CO1 1.Understand the system architecture and the functional standard specified in LTE 4G
			CO2 2.Analyze the role of LTE radio interface protocols and EPS Data convergence protocols to set up, reconfigure and release data and voice from users
			CO3 3.Demonstrate the UTRAN and EPS handling processes from set up to release including mobility management for a variety of data call scenarios.
			CO4 4.Test and Evaluate the Performance of resource management and packet data processing and transport algorithms
2	Fiber Optics Networks	17EC82	CO1 1.Classification and working of optical fiber with different modes of signal propagation.
			CO2 2. Describe the transmission characteristics and losses in optical fiber communication.
			CO3 3.Describe the construction and working principle of optical connectors, multiplexers and amplifiers
			CO4 5.Illustrate the networking aspects of optical fiber and describe various standards associated with it.
3	Machine Learning	17EC834	CO1 1.Understand the core concepts of Machine learning.
			CO2 2.Appreciate the underlying mathematical relationships within and across Machine Learning algorithms.
			CO3 3.Explain paradigms of supervised and un-supervised learning.
			CO4 4.Recognize a real world problem and apply the learned techniques of Machine Learning to solve the problem.
8th SEM (15 scheme)			
Sl No	Subject Name	Subject Code	Course Outcomes (CO)
1	Wireless Cellular and LTE	15EC81	CO1 1.Understand the system architecture and the functional standard specified in LTE 4G
			CO2 2.Analyze the role of LTE radio interface protocols and EPS Data convergence protocols to set up, reconfigure and release data and voice from users
			CO3 3.Demonstrate the UTRAN and EPS handling processes from set up to release including mobility management for a variety of data call scenarios.
			CO4 4.Test and Evaluate the Performance of resource management and packet data processing and transport algorithms
2	Fiber Optics Networks	15EC82	CO1 1.Classification and working of optical fiber with different modes of signal propagation.
			CO2 2. Describe the transmission characteristics and losses in optical fiber communication.
			CO3 3.Describe the construction and working principle of optical connectors, multiplexers and amplifiers
			CO4 5.Illustrate the networking aspects of optical fiber and describe various standards associated with it.
3	Machine Learning	15EC834	CO1 1.Understand the core concepts of Machine learning.
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			CO3 3.Explain paradigms of supervised and un-supervised learning.
			CO4 4.Recognize a real world problem and apply the learned techniques of Machine Learning to solve the problem.

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2 nd SEM C-Cycle			
1	Advanced Calculus and Numerical Methods	18MAT21	CO1 Solve differential equation of electric circuits, forced oscillation of mass spring and elementary heat transfer.
			CO2 Solve Partial differential equations, fluid mechanics, electromagnetic theory and heat transfer. Solution of Heat and Wave Equation.
			CO3 Evaluate double and triple integrals to find the area , volume , mass and moment of inertia of plane and solid region.
			CO4 Use curl and divergence of a vector valued functions in various applications of electricity, magnetism and fluid flows.
			CO5 Use Laplace transforms to determine general or complete solution to linear ordinary differential equation. Use of free energy in equilibria, materialize bulk properties and processes using thermodynamic considerations, electrochemical energy system.
2	Engineering Chemistry	18CHE22	CO1 Causes and effects of corrosion of metals and control of corrosion. Modification of surface properties of metals to develop resistance to corrosion, wear, tear, impact etc. by electroplating and electrolytic plating.
			CO2 Production & consumption of energy for industrialization of country and living standards of people. Electrochemical and concentration cells. Classical, modern batteries and fuel cells. Utilization of solar energy for different useful forms of energy.
			CO3 Environmental pollution, waste management and water chemistry.
			CO4 Different techniques of instrumental methods of analysis. Fundamental principles of nano materials.
			CO5 Illustrate simple algorithms from few different domains such as mathematics , Physics, etc.
3	C Programming for Problem Solving	18CPS23	CO1 Construct a programming solution to the given problem using C
			CO2 Identify and correct the syntax and logical errors in C programs.
			CO3 Modularize the given problem using functions & structures.
			CO4 Describe the operations of diodes, BJT, FET and Operational Amplifiers.
			CO5 Design and explain the construction of oscillators, regulators, amplifiers and oscillators.
4	Basic Electronics	18ELN24	CO1 Describe general operating principle of SCR and its application.
			CO2 Explain the different number system and their conversions and construct simple combinational and sequential logic circuits using Flip-Flops.
			CO3 Describe the basic principle of operation of communication system and mobile phones.
			CO4 Identify different sources of energy, their conversion process and also describe the basic concepts of thermodynamics and solving simple numerical problems on steam.
			CO5

			C05	Express the relationship between the motion of bodies and analyze the bodies in motion.
			C01	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.
			C02	Produce computer generated drawings using CAD software.
			C03	Use the knowledge of orthographic to represent engineering information/concepts and present the same in the form of drawings.
			C04	Develop isometric drawings of simple objects reading the orthographic projections of those objects.
			C05	Make use of matrix theory for solving system of linear equation and compute Eigen values and Eigen vector required for matrix diagonalization process.
5	Engineering Graphics	18EGDL25	C01	Recall the concepts of interference of light, diffraction of light, Fermi energy.
			C02	Understand the principles of operations of optical fibers and semiconductor devices such as photodiode, and NPN transistor and frequency response of LCR circuits.
			C03	Determine elastic moduli and moment of inertia of given materials with the help of suggested procedures.
			C04	Gain practical knowledge of Magnetic field intensity due to current and spring constant of a spring.
			C05	Understand the importance of measurement procedure, honest recording and representing the data, reproduction of final results.
6	Engineering Physics Lab	18PHYL26	C01	Identify the common electrical components and measuring instruments used for conducting experiments in the electrical laboratory.
			C02	Compare power factor of lamps.
			C03	Determine impedance of an electrical circuit and power consumed in a three phase load.
			C04	Determine earth resistance and understand two way and three way control of lamps.
7	Basic Electrical Engg. Lab	18ELEL27	C01	Identify common errors in spoken and written communication.
			C02	Get familiar with English vocabulary and language proficiency.
			C03	Improve nature and style of sensible writing and acquire employment and workplace communication skills.
			C04	Improve their technical communication skills through technical reading and writing practices.
			C05	Perform well in campus recruitment, engineering and all other general competitive exams.
8	Technical English	18EGCH28		

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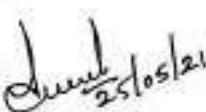
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 Kumbalagedu, Mysore Road, Bangalore - 560074



COURSE OUTCOMES

SL No	Subject Name	Subject Code	II Sem P- Cycle	
				Course Outcome(CO)
1	Calculus and Linear Algebra	18MAT21	CO1	Solve differential equation of electric circuit, forced oscillation of mass spring and elementary heat transfer.
			CO2	Solve Partial differential equations, fluid mechanics, electromagnetic theory and heat transfer. Solution of Heat and Wave Equation.
			CO3	Evaluate double and triple integrals to find the area , volume , mass and moment of inertia of plane and solid region.
			CO4	Use curl and divergence of a vector valued functions in various applications of electricity, magnetism and fluid flows.
			CO5	Use Laplace transform to determine general or complete solution to linear ordinary differential equation.
2	Engineering Physics	18PHY22	CO1	Understand various types of oscillations and their implications, the role of Shock waves in various fields.
			CO2	Recognize the elastic properties of materials for engineering.
			CO3	Realize the interrelation between time varying electric field and magnetic field, the transverse nature of the EM waves and their role in optical fiber communication.
			CO4	Compute Eigen values, Eigen functions for a particle using Time independent 1-D Schrodinger's wave equation. Appreciate the principle of laser, working of different types of lasers and applications.
			CO5	Understand various electrical and material properties of materials like conductors, semiconductors and dielectrics using different theoretical models.
3	Basic Electrical Engineering	18ELE23	CO1	Analyse to Ac and Dc circuits
			CO2	Explain the principle of operation and construction of single phase transformers
			CO3	Explain the principle of operation and construction of DC machine and synchronous machines
			CO4	Explain the principle of operation and construction of three phase induction motors
			CO5	Discuss the concept of electrical wiring circuit, protecting devices and earthing
4	Elements of Civil Engineering & Mechanics	18CIV24	CO1	Mention the applications of various fields of Civil Engineering.
			CO2	Compute the resultant of given force system subjected to various loads.
			CO3	Comprehend the action of Forces, Moments and other loads on systems of rigid bodies and compute the reactive forces that develop as a result of the external loads.
			CO4	Locate the Centroid and compute the Moment of Inertia of regular and built-up sections

5	Engineering Graphics	18EGDL25	C05	Express the relationship between the motion of bodies and analyze the bodies in motion.
			C01	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.
			C02	Produce computer generated drawings using CAD software.
			C03	Use the knowledge of orthographic to represent engineering information/concepts and present the same in the form of drawings.
			C04	Develop isometric drawings of simple objects reading the orthographic projections of those objects.
6	Engineering Physics Lab	18PHYL26	C05	Make use of matrix theory for solving system of linear equation and compute Eigen values and Eigen vector required for matrix diagonalization process.
			C01	Recall the concepts of interference of light, diffraction of light, Fermi energy.
			C02	Understand the principles of operations of optical fibers and semiconductor devices such as photodiode, and NPN transistor, and frequency response of LCR circuits.
			C03	Determine elastic moduli and moment of inertia of given materials with the help of suggested procedures.
			C04	Gain practical knowledge of Magnetic field intensity due to current and spring constant of a spring.
7	Basic Electrical Engg. Lab	18ELEL27	C05	Understand the importance of measurement procedure, honest recording and representing the data, construction of final results.
			C01	Identify the common electrical components and measuring instruments used for conducting experiments in the electrical laboratory.
			C02	Compare power factor of lamps.
			C03	Determine impedance of an electrical circuit and power consumed in a three phase load.
			C04	Determine earth resistance and understand two way and three way control of lamps.
8	Technical English	18EGH28	C01	Identify common errors in spoken and written communication.
			C02	Get familiar with English vocabulary and language proficiency.
			C03	Improve nature and style of sensible writing and acquire employment and workplace communication skills.
			C04	Improve their technical communication skills through technical reading and writing practices.
			C05	Perform well in campus recruitment, engineering and all other general competitive exams.


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