MANGALORE INSTITUTE OF TECHNOLOGY & ENGINEERING

(A Unit of Rajalaxmi Education Trust ® , Mangalore)
Autonomous Institute affiliated to VTU, Belagavi, Approved by AICTE, New Delhi
Accredited by NAAC with A+ Grade & ISO 9001:2015 Certified Institution

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
(Accredited by NBA)

2021 SCHEME

Course Title   : Transform calculus, Fourier series, and Numerical Techniques
Course Code   : 21MAT31
Course Index : C201
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

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

Course Title   : Digital System Design Using Verilog
Course Code   : 21EC32
Course Index : C202
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C202.1	Develop simplified switching equations using Karnaugh Maps and Quine McClusky techniques.
C202.2	Analyze and design of Combinational Circuits by understanding the operation of decoders, encoders, multiplexers, adders, subtractors, and comparators.
C202.3	Analyze the concepts of Flip Flops (SR, D, T, and JK) and to design the synchronous sequential circuits.
C202.4	Understand Verilog constructs and design combinational and sequential circuits using data flow description.
C202.5	Design and model digital circuits using behavioral, structural descriptions.

Course Title : Basic Signal Processing
Course Code : 21EC33
Course Index : C203
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C203.1	Understand the concept of vector spaces, linear independence, basis, dimension and orthogonality.
C203.2	Evaluate the Eigen values and Eigen vectors of a given matrix.
C203.3	Classify the signals and systems based on their properties and perform the operations on signals.
C203.4	Represent the Linear Time-Invariant (LTI) systems using impulse response and verify their properties.
C203.5	Compute Z-transforms, inverse Z- Z-transforms and analyze the transfer functions of LTI systems in Z-domain.

Course Title : Analog Electronic Circuits.
Course Code : 21EC34
Course Index : C204
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C204.1	Understand the characteristics of BJTs and FETs for switching and amplifier circuits.
C204.2	Design and analyze FET amplifiers and oscillators with different circuit configurations and biasing conditions.
C204.3	Understand the feedback topologies and approximations in the design of amplifiers and oscillators.
C204.4	Design of circuits using linear ICs for wide range applications such as ADC, DAC, filters and timers.
C204.5	Understand the power electronic device components and its functions for basic power electronic circuits.

Course Title : Analog & Digital Electronics Lab
Course Code : 21ECL35
Course Index : C205
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C205.1	Design and Analyze Amplifier, Oscillators using bipolar transistor and to demonstrate experiments using SCR and 555 Timer.
C205.2	Design and test Op amp circuits to realize the mathematical computations, DAC and precision rectifiers.
C205.3	Design and test the combinational logic circuits for the given specifications and sequential logic circuits for the given functionality.

Course Title : Social Connect and Responsibility
Course Code : 21SCR36
Course Index : C206
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C206.1	Understand the need, and social responsibility in plantation, adoption of a tree.
C206.2	Develop connections with people around through their history and knowing the history, culture of the city.
C206.3	Practice sustainability and creativity by understanding the usefulness of organic farming and wet waste management.
C206.4	Apply sustainability by learning the methods of water conservation.
C206.5	Build planning and organizational skills by inculcating healthy food practices.

Course Title : Constitution of India and Professional Ethics
Course Code : 21CIP37
Course Index : C207
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C207.1	Having Constitutional knowledge and legal literacy.
C207.2	Understand Engineering and Professional Ethics and responsibilities of engineers.

Course Title : LIC Lab Using Pspice/MultiSIM
Course Code : 21EC383
Course Index : C208
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C208.1	Simulate and realize the circuits using op-amps for various applications like Schmitt Trigger, Precision Rectifier, instrumentation amplifier and Zero crossing detector.
C208.2	Simulate & design active filter (low pas and high pass) circuits for the given specifications and analyse digital to analog converters using op-amp.
C208.3	Simulate and analyse RC Phase shift oscillators using op-amp, multivibrator circuits using 555Timer.

Course Title   : Complex Analysis, Probability and Statistical Methods
Course Code   : 21MAT41
Course Index : C209
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcome
C209.1	Use the concepts of an analytic function and complex potentials to solve the problems arising in electromagnetic field theory. Apply the concept of line integral to solve the problems on Cauchy theorem and Cauchy integrals.
C209.2	Understand the series solution of Bessel's and Legendre's differential equations and solve Legendre's polynomial equations.
C209.3	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C209.4	Apply discrete and continuous probability distributions to solve the probability models arising in the engineering field.
C209.5	Construct joint probability distributions occurring in digital signal processing. Demonstrate the validity of testing the hypothesis.

Course Title   : Digital Signal Processing
Course Code   : 21EC42
Course Index : C210
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcome
C210.1	Compute Discrete Fourier Transform (DFT)/Inverse DFT of discrete sequence using the definition and properties of DFT.
C210.2	Evaluate the DFT using linear filtering approach and develop Fast Fourier Transform (FFT) algorithms to reduce the computation time of DFT.
C210.3	Design Finite Impulse Response (FIR) filters using windowing technique and to realize FIR filters using Direct, Cascade form and Lattice structures.
C210.4	Design Infinite Impulse Response (IIR) filters using Butterworth approximation and to realize IIR filters using Direct form I, II structures.
C210.5	Implement FIR and IIR filters in fixed point Digital Signal Processor.

Course Title   : Circuits & Controls
Course Code   : 21EC43
Course Index : C211
COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C211.1	Analyse & Solve Electric Circuits, by applying, Loop Analysis, Nodal Analysis, and by applying Network Theorems.
C211.2	Evaluate Two Port parameters of a network and apply Laplace transforms to solve electric networks.
C211.3	Deduce the transfer function of a given physical system, from differential equation representation or block diagram representation and SFG representation.
C211.4	Determine time response specifications and analyse the stability of the system.
C211.5	Perform frequency response analysis to find the stability of the system and find the time response of the system by representing the State Model

Course Title   : Communication Theory
Course Code   : 21EC44
Course Index : C212
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C212.1	Describe the principle of generation, detection of AM, SSB, VSB modulation.
C212.2	Describe the principle of generation, detection, and applications of angle modulation.
C212.3	Characterize the influence of channel noise on analog modulated signals.
C212.4	Represent analog signal in digital format and describe the characteristics of pulse amplitude modulation and pulse position modulation techniques.
C212.5	Analyze the concepts of digitization of signals like sampling, quantizing, and encoding. Illustrate digital formatting representation used for multiplexers, vocoders, and video transmission.

Course Title   : Biology for Engineers
Course Code   : 21BE45
Course Index : C213
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

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

Course Title   : Communication Laboratory -1
Course Code   : 21ECL46
Course Index : C214
COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C214.1	Demonstrate the electronic circuits for filters, mixer using BJT/FET & analog modulation schemes by representing its waveforms.
C214.2	Design and test the sampling, Multiplexing, and PAM with relevant circuits and illustrate the operation of PCM and delta modulations for different input conditions.
C214.3	Simulate the analog and digital modulation schemes using MATLAB/SCILAB.

Course Title   : Samskrutika Kannada
Course Code   : 21KSK47
Course Index : C215A
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C215A.1	ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯವಾಗುತ್ತದೆ.
C215A.2	ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳು ಹಾಗು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಆಸಕ್ತಿ ಮೂಡಿಸುತ್ತದೆ.
C215A.3	ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ ಹಾಗೂ ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನಗಳ ಬಗ್ಗೆ ಅರಿವು ಮೂಡುತ್ತದೆ.

Course Title   : Balake Kannada
Course Code   : 21KBK47
Course Index : C215B
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C215B.1	To listen and understand the Kannada language properly.
C215B.2	To speak ,read and converse in Kannada language.

Course Title   : Embedded C Basics
Course Code   : 21EC481
Course Index   : C216
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C216.1	Develop C Program in 8051 for solving simple problems that manipulate input data using different instructions of 8051 C.
C216.2	Develop testing and experimental procedures on 8051 Microcontroller, analyze their operation under different cases with real-world problems.

Course Title   : Universal Human Values
Course Code   : 21UH49
Course Index   : C217
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C217.1	Understand and analyze the essentials of human values and skills, self-exploration, happiness, and prosperity.
C217.2	Evaluate the coexistence of the Self with the body.
C217.3	Identify and evaluate the role of harmony in the family, society, and universal order.
C217.4	Understand and associate the holistic perception of harmony at all levels of existence.
C217.5	Develop appropriate technologies and management patterns to create harmony in professional and personal lives.

Course Title: Inter/Intra Institutional Internship
Course Code: 21INT49
Course Index: C218
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C218.1	Enhance the existing knowledge and gain practical experience.
C218.2	Present the Knowledge acquired through internship by means of Oral Presentation.
C218.3	Work in teams and document the results obtained.
C218.4	Write reports based on the theme of the internship in a professional and reflective manner.
C218.5	Answer the questions related to the theme of the internship in a clear and descriptive manner.

Course Title: Digital Communication
Course Code: 21INT51
Course Index: C301
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C301.1	Test and validate symbol processing, understand the concept of signal processing of digital data and signal conversion to symbols at the transmitted and receiver.
C301.2	Compute performance parameters for symbol processing and recovery in ideal and corrupted channel conditions.
C301.3	Understand the principle of spread spectrum communication techniques and evaluate the performance parameters. .
C301.4	Understand the basic principles of information theory and various source coding techniques. Discuss the different types of errors and codes.
C301.5	Understand the concepts of LBC and convolutional codes and analyze codewords using time domain and transform domain approach.

Course Title: Computer Organization & ARM Microcontroller
Course Code: 21EC52
Course Index: C302
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C302.1	Understand the basic organization of a computer system.
C302.2	Demonstrate the functioning of different sub-systems, such as processor, Input/output, and memory.
C302.3	Describe the architectural features and instructions of the 32-bit microcontroller ARM Cortex M3.
C302.4	Apply the knowledge gained for Programming ARM Cortex M3 for different applications.

Course Title: Computer Communication Networks
Course Code: 21EC53
Course Index: C303
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C303.1	Understand the Layering Architecture of OSI reference model and TCP/IP protocol suite, along with services of data link layer.
C303.2	Understand the operations of data-link layer, identify the Media access Control and regarding wired and wireless LAN.
C303.3	Comprehend the network layer addressing, protocols and apply the unicast routing algorithm.
C303.4	Recognize transport layer services in a computer communication network.

C303.5	Understand application layer functions and protocol.

Course Title: Electromagnetic Waves
Course Code: 21EC54
Course Index: C304
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C304.1	Evaluate problems on electrostatic force, electric field due to point, linear, volume charges by applying conventional methods and charge in a volume.
C304.2	Apply Gauss law to evaluate Electric fields due to different charge distributions and Volume Charge distribution by using Divergence Theorem and determine potential and energy of a point charge.
C304.3	Determine capacitance of a parallel plate capacitor, coaxial cylindrical capacitor with different charge distributions using Laplace equation and Apply Biot-Savart's and Ampere's laws for evaluating Magnetic field for different current configurations
C304.4	Calculate magnetic force, potential energy and Magnetization with respect to magnetic materials and voltage induced in electric circuits.
C304.5	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.

Course Title: Communication Lab - II
Course Code: 21ECL55
Course Index: C305
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C305.1	Design and generate digital modulation schemes with simulation of source and error coding algorithms.
C305.2	Illustrate the operations of networking concepts and protocols using network simulators.

Course Title: Research Methodology & Intellectual Property Rights
Course Code: 21RMI56
Course Index: C306
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C306.1	Emphasize the meaning of engineering research.
C306.2	Comprehend the procedure of literature review, technical reading, attributions, and citations.
C306.3	Discuss the fundamentals of patent laws and drafting procedures.
C306.4	Understand the copyright laws and subject matters of copyrights and designs.
C306.5	Understand the basic principles of design rights.

Course Title: Environmental Studies
Course Code: 21CIV57
Course Index: C307
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C307.1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale.
C307.2	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.
C307.3	Develop critical thinking and observation skills, and apply them to the analysis of a problem or question related to the environment.
C307.4	Build the Global environmental concerns and the individual responsibility to protect the environment with environmental protection laws and education.
C307.5	Analyze and evaluate strategies, technologies, and methods for sustainable management of environmental systems and for the remediation or restoration of degraded environments.

Course Title: Internet of Things (IOT) Lab
Course Code: 21EC581
Course Index: C308
COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C308.1	Understand Internet of Things and its hardware and software components
C308.2	Interface I/O devices, sensors & communication modules and Remotely monitor data and control devices through Internet