



MANGALORE INSTITUTE OF TECHNOLOGY AND ENGINEERING
(An ISO 9001:2015 Certified Institution)

Department of Electronics and Communication Engineering

2018 SCHEME

Course Title : Transform calculus, Fourier series and Numerical Techniques

Course Code : 18MAT31

Course Index : 201

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C201.1	Apply Laplace transform and inverse Laplace transform in solving differential/integral equations arising in network analysis, control systems and other fields of engineering.
C201.2	Demonstrate Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing and field y.
C201.3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.
C201.4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
C201.5	Determine the externals of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

Course Title : Network Theory

Course Code : 18EC32

Course Index : C202

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C202.1	Simplify electrical network using star-delta transformation/source transformation /source shifting and solve electrical circuit using mesh/ nodal analysis.
C202.2	Solve electrical circuits by applying Superposition/Thevenin's/Norton's/Maximum Power Transfer/Millman's theorems.
C202.3	Analyze the behavior of R, R-L, R-L-C electrical circuit by considering initial/final conditions.
C202.4	Apply Laplace transform to solve the given network.
C202.5	Determine the Impedance (Z), Admittance (Y), Transmission (T) and Hybrid (h) parameters, their inter relationships for a two-port network. Analyze the frequency response of series and parallel resonant circuits.

Course Title : Electronic Devices

Course Code : 18EC33

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 basics of semiconductor physics.
C203.2	Understand the construction and working principles of P-N junctions and Optoelectronic devices like Solar Cells, Photo detectors and Light Emitting Diodes.
C203.3	Describe the mathematical models of BJTs along with the Constructional details.
C203.4	Utilize the mathematical models of semiconductor junctions and MOS transistors for electronic circuits and systems.
C203.5	Understand the fabrication process of semiconductor devices and CMOS Process integration.

Course Title : Digital System Design

Course Code : 18EC34

Course Index : C204

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C204.1	Develop simplified switching equations using Karnaugh Maps and Quine McClusky techniques.
C204.2	Design Combinational Circuits by understanding the operation of decoders, encoder, multiplexers, adder, subtractors, comparators.
C204.3	Understand the latches, SR, JK, D and T Flip-Flops with applications.
C204.4	Design Synchronous counters using flip- flops, Construct state diagrams using Mealy/ Moore Models.
C204.5	Understand the designing of sequential circuits using ROMSs and PLAs, CPLDs and FPGAs.

Course Title : Computer Organization and Architecture

Course Code : 18EC35

Course Index : C205

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C205.1	Understand the operational concepts of computers, machine instructions and programs, memory.
C205.2	Describe the addressing modes, assembly language basics, stacks and queue operations.
C205.3	Analyse the IO organizations and accessing methods, Enabling and disabling interrupts, DMA operations.
C205.4	Understand the memory systems and their roles in computer system.

C205.5	Understand the instruction execution steps with single bus and multiple bus organization.
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Course Title : Power Electronics and Instrumentation

Course Code : 18EC36

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 basics Power electronics systems and SCR, UJT with different triggering conditions.
C206.2	Analyze Full wave, half wave-controlled rectifier and Step down, step up Choppers.
C206.3	Analyze inverters, Switched mode Power Supplies
C206.4	Understand the principles of measurement and Develop circuits for Digital Voltmeter, Multimeter and Bridges to measure passive component values and frequency.
C206.5	Describe the operation of Transducers, Instrumentation amplifiers and Programmable Logic Controllers.

Course Title : Electronics Devices and Instrumentation Lab

Course Code : 18ECL37

Course Index : C207

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C207.1	Design and Test Diode rectifiers, Clippers, Clampers and controlled rectifier using SCR
C207.2	Test the characteristics of Zener diode, LDR, Photo diode, SCR and to measure temperature and resistance using bridge network.
C207.3	Simulate BJT, FET characteristics, UJT controlled rectifier and voltage regulator using EDA tool

Course Title : Digital System Design Lab

Course Code : 18ECL38

Course Index : C208

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C208.1	Simplify and Realize the given Boolean expression using logic gates and verify the same using truth table.
C208.2	Design and test adders, subtractors, comparators using multiplexers and decoders.
C208.3	Construct flips-flops and Design synchronous and asynchronous counters, shift registers.
C208.4	Simulate serial adder and binary multiplier using any open source/licensed tool.

Course Title : Aadalitha Kannada (Samskruthika Kannada)

Course Code : 18KAK39

Course Index : C209A

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C209A.1	ಆಡಳಿತ ಭಾಷೆಯ ಪರಿಚಯ, ವ್ಯಾಕರಣ, ಭಾಷಾ ರಚನೆಯ ನಿಯಮಗಳು ಮತ್ತು ಚಿಹ್ನೆಗಳ ಬಗ್ಗೆ ಅರಿವು ಮೂಡುತ್ತದೆ.
C209A.2	ಸಾಮಾನ್ಯ ಅರ್ಜಿಗಳು, ಸರ್ಕಾರಿ ಮತ್ತು ಅರೆ ಸರ್ಕಾರಿ ಪತ್ರವ್ಯವಹಾರದ ಬಗ್ಗೆ ಅರಿವು ಮೂಡುತ್ತದೆ.
C209A.3	ಕನ್ನಡದ ಕಾವ್ಯ ಹಾಗೂ ಸಾಹಿತ್ಯದ ಪರಿಚಯ ಮತ್ತು ಒಲವು ಮೂಡುತ್ತದೆ.

Course Title : Vyavaharika Kannada

Course Code : 18KVK39

Course Index : C209B

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C209B.1	Read and understand the simple words in Kannada language
C209B.2	Communicate in Kannada language

Course Title : Complex Analysis, Probability and Statistical Methods

Course Code : 18MAT41

Course Index : C210

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcome
C210.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
C210.2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
C210.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in the engineering field.
C210.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data. Construct joint probability distributions.
C210.5	Demonstrate the validity of testing the hypothesis.

Course Title : Analog Circuits

Course Code : 18EC42

Course Index : C211

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C211.1	Understand the amplifier circuits using BJT and MOSFET biasing schemes and to analyze the operation using small signal model.
C211.2	Study MOSFET CS-amplifiers using high frequency model and to construct FET based oscillators.
C211.3	Analyze the Feedback amplifiers and Power amplifier circuits.
C211.4	Analyze the operation of Op-Amp Negative Feedback amplifiers and to study the nonlinear applications of Op-Amp.
C211.5	Apply the knowledge in understanding Analog to Digital/Digital to Analog converters, Filters using Op-Amp, 555 timer and its applications.

Course Title : Control Systems

Course Code : 18EC43

Course Index : C212

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C212.1	Develop the mathematical model of mechanical and electrical systems.
C212.2	Develop transfer function for a given control system using block diagram reduction techniques and signal flow graph method.
C212.3	Determine the time domain specifications for first and second order systems.
C212.4	Determine the stability of a system in the time domain using Routh-Hurwitz criterion & Root-locus technique and in the frequency domain using Bode plot.
C212.5	Determine the stability of a system in the frequency domain using Polar plot & Nyquist Stability criterion and formulate system using state space model.

Course Title : Engineering Statistics and Linear Algebra

Course Code : 18EC44

Course Index : C213

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C213.1	Identify and associate random variables and distributive functions associated to Communication events.
C213.2	Understand two variable expectations, transformation and Joint probabilities for multiple random variables and application exercises to Chi-square Random Variables, Student-T Random Variables, and Cauchy and Rayleigh Random Variables.
C213.3	Interpret Random process, Correlation functions and analyze with effect of noise.
C213.4	Understand the concept of vector spaces, linear independence, basis and dimension, and Orthogonality and apply these concepts to various vector spaces and subspaces.
C213.5	Demonstrate by way of simulation or emulation the ease of analysis employing determinants, Eigen values, Diagonalization of matrix and Singular Value Decomposition.

Course Title : Signals and Systems

Course Code : 18EC45

Course Index : C214

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C214.1	Understand the classification and mathematical description of continuous/discrete time signals.
C214.2	Classify the systems based on their properties and represent the Linear Time Invariant (LTI) systems using impulse response.
C214.3	Classify the LTI systems based on their properties and represent the periodic signals in frequency domain using Fourier Series.
C214.4	Represent the aperiodic signals in frequency domain using Fourier Transform and its properties.
C214.5	Compute Z-transforms, inverse Z- transforms and analyze the transfer functions of LTI systems in Z-domain.

Course Title : Microcontrollers

Course Code : 18EC46

Course Index : C215

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C215.1	Describe the architectural features of 8051 microcontrollers, Memory organisation and external memory interfacing.
C215.2	Understand the addressing modes of 8051, Instruction set and to write assembly programs
C215.3	Apply the knowledge of stack and subroutines in writing assembly programs involving loops and to interface LED switch.
C215.4	Analyze timer and counter operations of 8051 and write assembly and c program for serial communication.
C215.5	Describe interrupt operations and to write assembly program to interface ADC, LCD, stepper motor to 8051.

Course Title : Microcontroller Laboratory

Course Code : 18ECL47

Course Index : C216

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C216.1	Write Assembly language programs in 8051 for solving simple problems that manipulate input data using different instructions of 8051.
C216.2	Interface different input and output devices to 8051 and control them using Assembly language programs.
C216.3	Interface the serial devices to 8051 and do the serial transfer using C programming.

Course Title : Analog Circuits Laboratory

Course Code : 18ECL48

Course Index : C217

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C217.1	Design and setup of BJT/FET Amplifiers and Oscillators.
C217.2	Design and setup Filters, DAC, Comparator, Adder, Differentiator, Integrator circuits using Op-Amp and multivibrator using 555 Timer.
C217.3	Simulate RC phase shift Oscillator, Hartely Oscillator, filters, precision rectifiers and multivibrator using EDA tool.

Course Title: Constitution of India, Professional Ethics and Human Rights

Course Code: 18CPH49

Course Index: C218

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C218.1	Have general knowledge and legal literacy about Indian Constitution and thereby it helps to take up competitive examinations & to manage/face complex societal issues in society.
C218.2	Understand state and central policies (Union and State Executive), fundamental Rights & their duties.
C218.3	Understand Electoral Process, Amendments and special provisions in Constitution.
C218.4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and Human Rights and NHRC.
C218.5	Understand Engineering & Professional ethics and responsibilities of Engineers.

Course Title : Technological Innovation Management And Entrepreneurship

Course Code : 18ES51

Course Index : C301

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C301.1	Understand functions of management involving planning and decision making process
C301.2	Understand and apply the Management Concepts of organizing, Staffing, Directing and controlling
C301.3	Describe the importance, characteristics of entrepreneurs and their social responsibilities
C301.4	Understand the Role and Importance of Family Business, Ideation Process, Feasibility Study and identify the sources of funding
C301.5	Apply the concepts of Business plans and network analysis

Course Title : Digital Signal Processing

Course Code : 18EC52

Course Index : C302

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C302.1	Compute Discrete Fourier Transform (DFT)/Inverse DFT of discrete sequence using the definition and properties of DFT along with its real and complex discrete time signals.
C302.2	Evaluate the DFT using linear filtering approach and develop Fast Fourier Transform (FFT) algorithms to reduce the computation time of DFT.
C302.3	Design Finite Impulse Response (FIR) filters using Rectangular, Hamming, Hanning and Bartlett windows and realize FIR filters using Direct form, Linear phase, Frequency sampling and Lattice structures.
C302.4	Design and analyze analog/digital Infinite Impulse Response (IIR) filters using Butterworth and to realize IIR filters using Direct form I, II structures.
C302.5	Understand basics of digital signal processors such as processor architectures and hardware units, investigates fixed-point and floating-point formats and illustrates the implementation of digital filters.

Course Title : Principles of Communication Systems

Course Code : 18EC53

Course Index : C303

COURSE OUTCOMES (CO): At the end of the course, the student will be able to:

CO	Course Outcomes
C303.1	Describe principle generation, detection of AM, SSB, VSB modulation.
C303.2	Describe principle generation, detection and applications of angle modulation.
C303.3	Illustrate random process of analog signal in time domain and types of noise in channel and analyze the performance of communication system in presence of noise.
C303.4	Represent analog signal in digital format using sampling and quantization
C303.5	Describe different digital modulation techniques such as PCM, Delta modulation, MPEG and Vocoders.

Course Title : Information Theory and Coding

Course Code : 18EC54

Course Index : C304

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C304.1	Calculate entropy, efficiency of dependent and independent sources.
C304.2	Analyze the performance of Shannon encoding algorithm, Shannon fano encoding algorithm, Huffman coding.
C304.3	Measure mutual information, channel capacity based on channel parameters.
C304.4	Design encoding, decoding procedure and detect correct errors of linear block codes, cyclic codes.
C304.5	Design encoding, decoding procedure for convolutional code and analyze error.

Course Title : Electromagnetic Waves

Course Code : 18EC55

Course Index : C305

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C305.1	Evaluate problems on electrostatic force, electric field due to point, linear, volume charges by applying conventional methods and charge in a volume.
C305.2	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.
C305.3	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
C305.4	Calculate magnetic force, potential energy and Magnetization with respect to magnetic materials and voltage induced in electric circuits.
C305.5	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 : Verilog Hardware Description Language

Course Code : 18EC56

Course Index : C306

COURSE OUTCOMES (CO): At the end of the course the student will be able to:

CO	Course Outcomes
C306.1	Distinguish digital design methodologies, module and module instances. Analyze & apply simulation components to digital design.
C306.2	Design Verilog module with system task and compiler directives

C306.3	Design digital circuit using gate-level and data flow modeling.
C306.4	Design digital circuit using behavioral modeling and to understand Verilog tasks, functions.
C306.5	Interpret the various constructs in logic synthesis and to perform timing and delay simulation.

Course Title : Digital Signal Processing Lab

Course Code : 18ECL57

Course Index : C307

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C307.1	Determine the sampling frequency required for a multispectral signal and to solve given difference equation.
C307.2	Perform convolution, correlation of two given sequences. Further, verify the properties of the convolution and correlation
C307.3	Obtain the transform domain representation of a sequence using the DFT. Plot the magnitude and phase spectrum. Apply the DFT properties to obtain the transformed domain representation in an efficient way.
C307.4	Design the FIR and IIR filter for the given specifications

Course Title : Hardware Description Language Lab

Course Code : 18ECL58

Course Index : C308

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C308.1	Write the Verilog programs to simulate Combinational Circuits in Dataflow, Behavioral and Gate Level Abstractions
C308.2	Describe sequential circuits like flip flops and counters in Behavioral description and obtain simulation waveforms.
C308.3	Synthesize Combinational and Sequential circuits on Programmable IC's and test the functionality on hardware.
C308.4	Interface the hardware to the programmable chips and obtain the required output.

Course Title : Environmental Studies

Course Code : 18CIV59

Course Index : C309

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C309.1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale.

C309.2	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.
C309.3	Develop critical thinking and observation skills, and apply them to the analysis of a problem or question related to the environment.
C309.4	Build the Global environmental concerns and the individual responsibility to protect environment with environmental protection laws and education.
C309.5	Analyze and evaluate strategies, technologies, and methods for sustainable management of environmental systems and for the remediation or restoration of degraded environments.

Course Title : Digital Communication

Course Code : 18EC61

Course Index : C310

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C310.1	Associate and apply the concepts of Bandpass sampling to well specified signals and channels.
C310.2	Compute performance parameters of system for lowpass and bandpass signals under ideal, corrupted and non-band limited conditions.
C310.3	Test and validate symbol processing and performance parameters at the receiver under ideal and non-ideal band limited channels.
C310.4	Analyse and demonstrate by simulation and emulation the transmission and reconstruction of band pass signals subjected to errors in a band limited channel.
C310.5	Understand the principle of spread spectrum communication techniques and evaluate the performance parameters.

Course Title : Embedded Systems

Course Code : 18EC62

Course Index : C311

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C311.1	Describe the architectural features of ARM Cortex M3, a 32-bit microcontroller including memory map, interrupts and exceptions.
C311.2	Write C and assembly language program for ARM cortex M3 using Bit-band operations, memory mapping
C311.3	Understand the basic hardware components in an embedded system and their application areas.
C311.4	Describe the hardware software co-design and firmware design approaches
C311.5	Explain the need of real time operating system for embedded system applications.

Course Title : Microwave and Antennas

Course Code : 18EC63

Course Index : C312

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C312.1	Describe the use and advantages of microwave generation and transmission using reflex klystron and Analyze the parameters related to microwave transmission lines and waveguides
C312.2	Analyze S matrix representation for Multi-Port Networks and Identify microwave devices for several applications.
C312.3	Understand strip lines in coplanar transmission lines and apply the basic parameters of antenna to determine directivity of radiation patterns in terms of beamwidth.
C312.4	Analyze isotropic point sources in an array system and design an array antenna for N isotropic sources. Derive the expression for radiation patterns of various antennae
C312.5	Distinguish the antennas (Wire, Aperture and Array Antennas) according to the applications.

Course Title : Python Application Programming

Course Code : 18EC646

Course Index : C313

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C313.1	Understand Python syntax and semantics and be fluent in the use of Python flow control and functions.
C313.2	Demonstrate Strings and File Systems in Python.
C313.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
C313.4	Interpret the concepts of Object-Oriented Programming as used in Python.
C313.5	Implement exemplary applications related to Network Programming and Web Services in Python.

Course Title : Basics of Rockets & Missiles

Course Code : 18AE653

Course Index : C314A

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C314A.1	To introduce the concepts of rocket engines and its application in space mission.
C314A.2	To Study the solid and liquid rocket motor Systems.
C314A.3	Compute various types of aerodynamic forces acting on the rocket and missile during the flight.
C314A.4	Acquire the knowledge on launch vehicle dynamics and attitude control.

C314A.5	To understand the types of Rocket Testing and judge the materials for rocket and missile components.
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Course Title : Introduction to Data Structures and Algorithm

Course Code : 18CS652

Course Index : C314B

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C314B.1	Understand the logic, develop the algorithm and write the flow chart and pseudo-code for the given problem.
C314B.2	Understand the concept of arrays, structures and pointers to organize and access data and apply static and dynamic methods for allocating memory to store data.
C314B.3	Implement stacks and queues using static and dynamic arrays.
C314B.4	Able to implement and traverse Queues and Trees.
C314B.5	Able to understand the concept of Graphs and implement different Sorting techniques on arrays.

Course Title : Programming in JAVA

Course Code : 18CS653

Course Index : C314C

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C314C.1	Describe object-oriented programming and different Data types, Variables, and Arrays in Java programming.
C314C.2	Develop simple Java programs using operators and control statements.
C314C.3	Introduce the concepts of Classes and Inheritance in Java programs to solve real world problems.
C314C.4	Demonstrate the creation and use of packages, and the concept of exception handling in Java.
C314C.5	Demonstrate the concept of I/O, Enumeration, type wrapper, Applet and string handling in Java

Course Title : Remote Sensing and GIS

Course Code : 18CV651

Course Index : C314D

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C314D.1	Make use of data and delineate various elements from the satellite imagery using their spectral signature.

C314D.2	Analyze different features of ground information to create raster or vector data.
C314D.3	Take part in digital classification and create different thematic maps for solving specific problems.
C314D.4	Build decision based GIS analysis on thematic maps for planning and management.
C314D.5	Apply the modern tool of Remote Sensing and GIS in Natural Resource Management.

Course Title : Supply Chain Management

Course Code : 18ME653

Course Index : C314E

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C314E.1	Understand and explain the supply chain importance, key decisions and business strategies to improve performance and reduce cost.
C314E.2	Interpret theoretical logic for make versus buy decisions to select supplier by identifying core processes to create a world-class supply base.
C314E.3	Plan warehouse management system by controlling material handling, transportation and traffic management. Also, design an effective distribution network with a model facility location and capacity allocations.
C314E.4	Make use of Network optimization model, decision trees to reduce the impact of uncertainty on network design.
C314E.5	Explain the integration of information technology with supply chain for the effective forecasting and reduced uncertainty for agile supply chain management.

Course Title : Robotics and Automation

Course Code : 18MT651

Course Index : C314F

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C314F.1	To understand the basic concepts of robot.
C314F.2	To Understand the types of power sources and analyze the functions of sensors in a robot.
C314F.3	To Understand manipulators, actuators and grippers.
C314F.4	To Understand the basics of industrial automation and safety.
C314F.5	To Understand the concepts of material handling system and automatic identification systems.

Course Title : Embedded Systems Lab

Course Code : 18ECL66

Course Index : C315

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C315.1	Understand the instruction set of 32-bit ARM Cortex M3 and the Keil IDE for programming in Assembly and Embedded C language.
C315.2	Develop Embedded C program to display message on LCD using UART & generate PWM, interface DAC.
C315.3	Develop Embedded C program to interface Cortex M3 to LED's, 7 segment display & to control DC, Stepper Motor.
C315.4	Develop Embedded C programs to interface temperature sensors (LM35) using SPI ADC, Hex keypad.

Course Title : Communication Lab

Course Code : 18ECL67

Course Index : C316

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C316.1	Design and test the analog and digital modulation circuits and display the waveforms.
C316.2	Understand the microwave signal measurement, the characteristics of different microwave devices and various antennas.
C316.3	Simulate the digital modulation systems and compare the error performance of basic digital modulation schemes.

Course Title : Mini-Project

Course Code : 18ECMP68

Course Index : C317

COURSE OUTCOMES (CO): At the end of the course, the students will be able to:

CO	Course Outcomes
C317.1	Apply the knowledge, identify and collect information to deduce a problem statement for Mini project through discussion.
C317.2	Identify the applicable tools to design and develop solution for the Proposed Problem.
C317.3	Effectively Document and present the work with professional ethics as an individual or working as a team.