SHREE DEVI INSTITUTE OF TECHNOLOGY
(Affiliated to Visvesvaraya Technological University & Recognized by AICTE)
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGG
2018 Scheme

Course Name	Transform Calculus, Fourier Series and Numerical Techniques
Course Code	18MAT 31
Course Outcomes (COs): At the end of the course the student will be able to:	
C201.1	Use Laplace transform and inverse Laplace transform in solving differential integral equation arising in network analysis, control systems and other field 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 theory
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 extremes of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C201.1	3	2										
C201.2	3	2										
C201.3	3	2										
C201.4	3	2										
C201.5	3	2										
Max	3	2										

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Course Name	Network Theory
Course Code	18EC32
Course Outcomes (Cos): At the end of the course the student will be able to:	
C202.1	Determine currents and voltages using source transformation / source shifting/ mesh/ nodal analysis and reduce given network using star- delta transformation / source transformation/ source shifting.
C202.2	Solve network problems by applying superposition / Thevenin/ Norton/ Maximum Power Transfer / Milkman's Network Theorems and electrical laws to reduce circuit complexities and to arrive at feasible solutions.
C202.3	Calculate current and voltages for the given circuit under transient conditions and apply Laplace transform to solve the given network.
C202.4	Solve the given network using specified two port network parameters – Z, Y, T&h.
C202.5	Understand the concept of resonance and determine the parameters that characterize series/ parallel resonance circuits.

COs	CO-PO Mapping												
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C202.1	1	2	1									
C202.2	1	2	1									
C202.3	1	2	1									
C202.4	1	2	1									
C202.5	1	2	1									
Max	1	2	1									

Course Name	Electronic Devices
Course Code	18EC33
Course Outcomes (COs): At the end of the course the student will be able to:	
C203.1	Understand the principles of semiconductor physics.
C203.2	Understand the principles and characteristics of different types of semiconductor devices.
C203.3	Understand the fabrication process of semiconductor devices.
C203.4	Utilize the mathematical models of semiconductor junctions for circuits and systems.
C203.5	Identify the mathematical models of MOS transistors for circuits and systems.

COs	CO-PO Mapping												
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C203.1	3	2	1									
C203.2	3	2	1									
C203.3	3	2	1									
C203.4	3	2	1									
C203.5	3	2	1									
Max	3	2	1									

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Course Name	Digital System Design
Course Code	18EC34
Course Outcomes (COs): At the end of the course the student will be able to:	
C204.1	Explain the concept of combinational and sequential logic circuits.
C204.2	Analyze and design the combinational logic circuits.
C204.3	Describe and characterize flip-flops and its applications.
C204.4	Design the sequential circuits using SR, JK, D, T flip- flops and Mealy and Moore machines.
C204.5	Design applications of Combinational and Sequential Circuits.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C204.1	3	2										
C204.2	3	2										
C204.3	3	2										
C204.4	3	2										
C204.5	3	2										
Max	3	2										

Course Name	Computer Organization and Architecture
Course Code	18EC35
Course Outcomes (COs): At the end of the course the student will be able to:	
C205.1	Explain the basic organization of a computer system
C205.2	Describe the addressing modes, instruction formats and program control statement.
C205.3	Explain the different ways of accessing an input/output device including interrupts.
C205.4	Illustrate the organization of different types of semiconductor and other secondary storage memories.
C205.5	Illustrate simple processor organization based on hardwired control and micro programmed control.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C205.1	2	2	1									
C205.2	2	2	1									
C205.3	2	2	1									
C205.4	2	2	1									
C205.5	2	2	1									
Max	2	2	1									

Course Name	Power Electronics and Instrumentation
Course Code	18EC36
Course Outcomes (COs): At the end of the course the student will be able to:	
C206.1	Build and test circuits using power electronic devices.
C206.2	Analyze and design controlled rectifier, DC to DC converters, DC to AC inverters and SMPS
C206.3	Analyze instrument characteristics and errors.
C206.4	Describe the principle of operation and develop circuits for multirange ammeters, voltmeters and bridges to measure passive component values and frequency.
C206.5	Explain the principle, design and analyze the transducers for measuring physical parameters.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C206.1	2	2	1									
C206.2	2	2	1									
C206.3	2	2	1									
C206.4	2	2	1									
C206.5	2	2	1									
Max	2	2	1									

Course Name	Electronic Devices and Instrumentation Laboratory
Course Code	18ECL37
Course Outcomes (COs): At the end of the course the student will be able to:	
C207.1	Recognize and demonstrate functioning of semiconductor power devices.
C207.2	Evaluate the characteristics, switching, power conversion and control by semiconductor power devices.
C207.3	Analyze the response and plot the characteristics of transducers such as LDR, Photo Diode etc.
C207.4	Design and test simple electronic circuits for measurement of temperature and resistance.
C207.5	Use circuit simulation software for the implementation and characterization of electronic circuits and devices.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C207.1	2	2		2								
C207.2	2	2		2								
C207.3	2	2		2								
C207.4	2	2		2								
C207.5	2	2		2								
Max	2	2		2								

Course Name	Digital System Design
Course Code	18ECL38
Course Outcomes (COs): At the end of the course the student will be able to:	
C208.1	Design, realize and verify DeMorgans Theorem, SOP,POS forms.
C208.2	Demonstrate the truth table of various expression and combinational circuits using logic gates.
C208.3	Design various combinational circuits such as adders, subtractors, comparators, multiplexers and demultiplexers.
C208.4	Construct flip- flops, counters and shift registers.
C208.5	Simulate Serial Adder and Binary Multiplier.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C208.1	2	2	2									
C208.2	2	2	2									
C208.3	2	2	2									
C208.4	2	2	2									
C208.5	2	2	2									
Max	2	2	2									

Course Title   : Kannada KaliCourse

Code/Index   : 18KKL39 Course

Index   : C209B

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

CO	Course Outcomes
C209.1	Read and understand the simple words in Kannada language
C209.2	Learn Vyavaharika Kannada (Kannada for Communication)
C209.3	Gain some interest on Kannada Language and Literature

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C209.1										3		
C209.2										3		
C209.3										3		
Max										3		

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Course Name	Complex Analysis, Probability and Statistical Methods
Course Code	18MAT41

Course Outcomes (COs): At the end of the course the student will be able to:

C209.1	Use the concepts of analytic function and complex potentials to solve the problem arising in electromagnetic field theory.
C209.2	Utilize conformal transformation and complex integral arising in aero foil theory, fluid flow visualization and image processing.
C209.3	Apply discrete and continuous probability distributions in analyzing the probability distributions in analyzing the probability models arising in engineering field.
C209.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C209.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C209.1	2	2										
C209.2	2	2										
C209.3	2	2										
C209.4	2	2										
C209.5	2	2										
Max	2	2										

Course Name	Analog Circuits
Course Code	18EC42

Course Outcomes (COs): At the end of the course the student will be able to:

C210.1	Understand the characteristics of BJTs and FETs.
C210.2	Design and analyze BJT and FET amplifier circuits.
C210.3	Design sinusoidal and non-sinusoidal oscillators.
C210.4	Understand the functioning of linear ICs.
C210.5	Design of linear IC based circuits.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C210.1	2	2	2									
C210.2	2	2	2									
C210.3	2	2	2									
C210.4	2	2	2									
C210.5	2	2	2									
Max	2	2	2									

Course Name	Control Systems
Course Code	18EC43
Course Outcomes (COs): At the end of the course the student will be able to:	
C211.1	Develop the mathematical model of mechanical and electrical systems.
C211.2	Develop transfer function for a given control system using block diagram reduction techniques and signal flow graph method.
C211.3	Determine the time domain specifications for first order and second order systems.
C211.4	Determine the stability of a system in the time domain using Routh Hurwitz criterion and Root Locus technique.
C211.5	Determine the stability of a system in the frequency domain using Nyquist and bode plots.

COs	CO-PO Mapping											
	POs											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
C211.1	3	3	2									
C211.2	3	3	2									
C211.3	3	3	2									
C211.4	3	3	2									
C211.5	3	3	2									
Max	3	3	2									

Course Name	Engineering Statistics and Linear Algebra
Course Code	18EC44
Course Outcomes (COs): At the end of the course the student will be able to:	
C212.1	Analyze and evaluate single and multiple random variables.
C212.2	Identify and associate random variables and random process in communication events.
C212.3	Analyze and model the random events in typical communication events to extract quantitative statistical parameters.
C212.4	Analyze and model typical signal sets in terms of a basis function set of amplitude, phase and frequency.
C212.5	Demonstrate by way of simulation or emulation the ease of analysis employing basis function, statistical representation and Eigen Values.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C212.1	3	2	1		2						1	2
C212.2	3	2	1		2						1	2
C212.3	3	2	1		2						1	2
C212.4	3	2	1		2						1	2
C212.5	3	2	1		2						1	2
Max	3	2	1		2						1	2

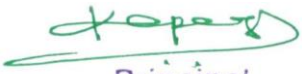| Course Name	Signals and Systems
Course Code	18EC45
Course Outcomes (COs): At the end of the course the student will be able to:	
C213.1	Analyze the different types of signals and systems.
C213.2	Determine the linearity, causality, time- invariance and stability properties of continuous and discrete time systems.
C213.3	Evaluate the convolution sum and integral.
C213.4	Represent continuous and discrete signals & systems in frequency domain using Fourier representations.
C213.5	Analyze discrete time signals and systems using Z transforms.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C213.1	2	2	2									
C213.2	2	2	2									
C213.3	2	2	2									
C213.4	2	2	2									
C213.5	2	2	2									
Max	2	2	2									

Course Name	Microcontroller
Course Code	18EC46
Course Outcomes (COs): At the end of the course the student will be able to:	
C214.1	Explain the difference between Microprocessors & Microcontrollers, Architecture of 8051 Microcontroller, and Interfacing of 8051 to external memory and instruction set of 8051.
C214.2	Write 8051 Assembly level programs using 8051 instruction set.
C214.3	Explain the interrupt system, operation of timers/ counters and serial port of 8051.
C214.4	Write 8051 Assembly language programs to generate square wave on 8051 I/O port pin using interrupt and C program to send & receive serial data using 8051serial port.
C214.5	Interface simple switches, simple LEDs, ADC 0804, LCD and Stepper Motor to 8051 I/O ports.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C214.1	2	2										
C214.2	2	2										
C214.3	2	2										
C214.4	2	2										
C214.5	2	2										
Max	2	2										

Course Name	Microcontroller Laboratory
Course Code	18ECL47
Course Outcomes (COs): At the end of the course the student will be able to:	
C215.1	Enhance programming skills using Assembly Language and C.
C215.2	Write Assembly Language programs in 8051 for solving simple problems that manipulate input data using different instructions of 8051.
C215.3	Interface different input and output devices to 8051 and control them using Assembly Language programs.
C215.4	Interface the serial devices to 8051 and do the serial transfer using C programming.
C215.5	Develop applications based on Microcontroller 8051.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C215.1	2	2	2		2							
C215.2	2	2	2		2							
C215.3	2	2	2		2							
C215.4	2	2	2		2							
C215.5	2	2	2		2							
Max	2	2	2		2							

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Course Name	Analog circuits Laboratory
Course Code	18ECL48

Course Outcomes (COs): At the end of the course the student will be able to:

C216.1	Analyze Frequency response of JFET/MOSFET amplifier.
C216.2	Design BJT/ FET amplifier with and without feedback and evaluate their performance characteristics.
C216.3	Apply the knowledge gained in the design of BJT/ FET circuits in oscillators.
C216.4	Design analog circuits using OPAMP for different applications.
C216.5	Simulate and analyze analog circuits that uses ICs for different electronic applications.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C216.1	2	2	3	3								
C216.2	2	2	3	3								
C216.3	2	2	3	3								
C216.4	2	2	3	3								
C216.5	2	2	3	3								
Max	2	2	3	3								

Course Name	Constitution of India, Professional Ethics and Human Rights
Course Code	18CPH49

Course Outcomes (COs): At the end of the course the student will be able to:

C217.1	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.
C217.2	Understand state and central policies (Union and State Executive), fundamental Rights & their duties.
C217.3	Understand Electoral Process, Amendments and special provisions in Constitution.
C217.4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and Human Rights and NHRC.
C217.5	Understand Engineering & Professional ethics and responsibilities of Engineers.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C217.1						1	1	3	1			1
C217.2						1	1	3	1			1
C217.3						1	1	3	1			1
C217.4						1	1	3	1			1
C217.5						1	1	3	1			1
Max						1	1	3	1			1

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Course Name	Technological Innovation Management And Entrepreneurship
Course Code	18ES51

Course Outcomes (COs): At the end of the course the student will be able to:

C301.1	Understandfunctionsof managementinvolvingplanninganddecisionmakingprocess
C301.2	UnderstandandapplytheManagementConceptsoforganizing,Staffing,Directingandcontrolling
C301.3	Describetheimportance, characteristicsof entrepreneursandtheirsocialresponsibilities
C301.4	UnderstandtheRoleandImportanceofFamilyBusiness,IdeationProcess,FeasibilityStudyand identify thesources offunding
C301.5	ApplytheconceptsofBusiness plansandnetwork analysis

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C301.1					2	2		3	3	2	3	2
C301.2					2	2		3	3	2	3	2
C301.3					2	2		3	3	2	3	2
C301.4					2	2		3	3	2	3	2
C301.5					2	2		3	3	2	3	2
Max					2	2		3	3	2	3	2

Course Name	Digital Signal Processing
Course Code	18EC52

Course Outcomes (COs): At the end of the course the student will be able to:

C302.1	ComputeDiscreteFourierTransform(DFT)/InverseDFTofdiscretesequenceusingthedefinitionandpropertiesofDFT along withitsrealandcomplexdiscretetimesignals.
C302.2	EvaluatetheDFTusinglinearfilteringapproachanddevelopFastFourierTransform(FFT)algorithms to reducethe computationtimeof DFT.
C302.3	DesignFiniteImpulseResponse(FIR)filtersusingRectangular,Hamming,Hanningand BartlettwindowsandrealizeFIRfiltersusingDirectform,Linearphase,Frequencysamplingand Latticestructures.
C302.4	Designandanalyzeanalog/digitalInfiniteImpulseResponse(IIR)filtersusingButterworthand torealizeIIRfilters usingDirectformI,IIstructures.
C302.5	Understandbasicsofdigitalsignalprocessorssuchasprocessorarchitecturesandhardware units, investigates fixed-point and floating-point formats and illustrates theimplementation of digital filters.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C302.1	2	1	1									
C302.2	2	1	1									
C302.3	2	1	1									

	2	1	1									
C302.4												
C302.5	2	1	1									
Max	2	1	1									

Course Name	Principles of Communication Systems
Course Code	18EC53

Course Outcomes (COs): At the end of the course the student will be able to:

C303.1	Describeprinciplegeneration, detectionofAM,SSB, VSBmodulation.
C303.2	Describeprinciplegeneration, detectionandapplications ofanglemodulation.
C303.3	Illustraterandomprocessofanalogsignalintimedomainandtypesofnoiseinchannelandanalyzethe performanceof communication systemin presenceof noise.
C303.4	Representanalogsignalindigitalformatusingsamplingandquantization
C303.5	Describe different digital modulation techniques such as PCM, Delta modulation, MPEGandVocoders.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C303.1	2	2										
C303.2	2	2										
C303.3	2	2										
C303.4	2	2										
C303.5	2	2										
Max	2	2										

Course Name	Information Theory and Coding
Course Code	18EC54

Course Outcomes (COs): At the end of the course the student will be able to:

C304.1	Calculateentropy, efficiencyofdependentandindependentsources.
C304.2	AnalyzetheperformanceofShannonencodingalgorithm,Shannonfanoencodingalgorithm,Huffman coding.
C304.3	Measuremutualinformation,channelcapacitybasedonchannelparameters.
C304.4	Designencoding,decodingprocedureanddetectcorrecterrorsoflinearblockcodes,cycliccodes.
C304.5	Designencoding,decodingprocedureforconvolutionalcode andanalyzeerror.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C304.1	2	2										
C304.2	2	2										
C304.3	2	2										
C304.4	2	2										
C304.5	2	2										
Max	2	2										

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Course Name	ElectromagneticWaves
Course Code	18EC55
Course Outcomes (COs): At the end of the course the student will be able to:	
C305.1	Evaluateproblemsonelectrostaticforce,electricfieldduetopoint,linear,volumechargesbyapplying conventional methods andchargein a volume.
C305.2	Apply Gauss law to evaluate Electric fields due to different charge distributions andVolume Charge distribution by using Divergence Theorem and determine potential andenergyofapoint charge.
C305.3	Determine capacitance of a parallel plate capacitor, coaxial cylindrical capacitor withdifferentchargedistributionsusingLaplaceequationandApplyBiot-Savart'sandAmpere'slawsforevaluatingMagneticfield for different current configurations
C305.4	Calculatemagneticforce,potentialenergyandMagnetizationwithrespecttomagneticmaterialsand voltageinduced in electriccircuits.
C305.5	ApplyMaxwell'sequationsfortimevaryingfields,EMwavesinfreespaceandconductorsandEvaluatepowerassociated withEMwaves usingPoynting theorem.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C305.1	2	2										
C305.2	2	2										
C305.3	2	2										
C305.4	2	2										
C305.5	2	2										
Max	2	2										
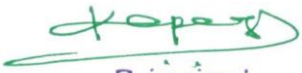
Course Name	Verilog Hardware Description Language
Course Code	18EC56
Course Outcomes (COs): At the end of the course the student will be able to:	
C306.1	Distinguishdigitaldesignmethodologies,moduleandmoduleinstances.Analyze&applysimulation components to digital design.
C306.2	DesignVerilogmodule withsystemtaskandcompilerdirectives
C306.3	Designdigitalcircuitusinggate-levelanddata flowmodeling.
C306.4	Designdigitalcircuitusingbehavioralmodelingandtounderstand Verilogtasks,functions .
C306.5	Interpretthevariousconstructsinlogicsynthesisandtoperformtiminganddelaysimulation.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C306.1	2	2	2		2							
C306.2	2	2	2		2							
C306.3	2	2	2		2							
C306.4	2	2	2		2							
C306.5	2	2	2		2							
Max	2	2	2		2							

Course Name	DigitalSignalProcessingLab
Course Code	18ECL57

Course Outcomes (COs): At the end of the course the student will be able to:

C307.1	Determinethesamplingfrequencyrequiredforamultispectralsignalandtosolvegivendifference equation.
C307.2	Performconvolution,correlationoftwogivensequences.Further,verifythepropertiesoftheconvolution and correlation
C307.3	Obtainthetransformdomainrepresentationofasequenceusingthe DFT.Plotthemagnitude and phase spectrum. Apply the DFT properties to obtain the transformeddomainrepresentation in an efficient way.
C307.4	DesigntheFIRandIIRfilterforthegivenspecifications

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C307.1	3	2	3									
C307.2	3	2	3									
C307.3	3	2	3									
C307.4	3	2	3									
Max	3	2	3									

Course Name	Hardware Description Language Lab
Course Code	18ECL58

Course Outcomes (COs): At the end of the course the student will be able to:

C308.1	WritetheVerilogprogramstosimulateCombinationalCircuitsinDataflow,BehavioralandGate LevelAbstractions
C308.2	Describesequentialcircuitslikeflipflopsandcountersin Behavioraldescriptionandobtainsimulation waveforms.
C308.3	SynthesizeCombinationalandSequentialcircuitsonProgrammableIC'sandtestthefunctionalityon hardware.
C308.4	Interfacethehardwaretotheprogrammable chipsandobtaintherequiredoutput.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C308.1	2	2	2									
C308.2	2	2	2									
C308.3	2	2	2									
C308.4	2	2	2									
Max	2	2	2									

Course Name	Environmental Studies
Course Code	18CIV59
Course Outcomes (COs): At the end of the course the student will be able to:	
C309.1	Applytheirecologicalknowledgetoillustrateandgraphaproblemanddescribetherealitiesthat managers facewhen dealingwith complex issues.
C309.2	Develop critical thinking and observation skills, and apply them to the analysis of aproblemor question related to theenvironment.
C309.3	BuildtheGlobalenvironmentalconcerns andtheindividualresponsibilitytoprotectenvironmentwith environmental protection lawsand education.
C309.4	Analyze and evaluate strategies, technologies, and methods for sustainablemanagement of environmental systems and for the remediation or restoration ofdegradedenvironments.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C309.1							2	2	2			
C309.2							2	2	2			
C309.3							2	2	2			
C309.4							2	2	2			
Max							2	2	2			

Course Name	Digital Communication
Course Code	18EC61
Course Outcomes (COs): At the end of the course the student will be able to:	
C310.1	Associateandapplytheconceptsof Bandpasssamplingtowellspecifiedsignalsandchannels.
C310.2	Computeperformanceparametersofsystemforlowpassandbandpasssignalsunderideal,corrupted and non-band limited conditions.
C310.3	Testandvalidatesymbolprocessingandperformanceparametersatthereceiverunderidealandnon-ideal bandlimited channels.
C310.4	Analyse and demonstrate by simulation and emulation the transmission andreconstructionofband pass signalssubjected to errors inaband limited channel.
C310.5	Understandtheprincipleofspreadspectrumcommunicationtechniquesandevaluatetheperformanceparameters.

COs	CO-PO Mapping												
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C310.1	2	2	2									
C310.2	2	2	2									
C310.3	2	2	2									
C310.4	2	2	2									
C310.5	2	2	2									
Max	2	2	2									

Course Name	Embedded Systems
Course Code	18EC62
Course Outcomes (COs): At the end of the course the student will be able to:	
C311.1	Describethearchitecturalfeaturesof ARMCortexM3,a32-bitmicrocontrollerincludingmemory map, interrupts and exceptions.
C311.2	WriteCandassemblylanguageprogramfor ARMcortexM3usingBit-bandoperations,memory mapping
C311.3	Understandthebasichardwarecomponentsinanembeddedsystemandtheirapplicationareas.
C311.4	Describethehardwaresoftware co-designand firmwaredesignapproaches
C311.5	Explaintheneed of real timeoperatingsystem for embedded systemapplications.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C311.1	2	1	1									
C311.2	2	1	1									
C311.3	2	1	1									
C311.4	2	1	1									
C311.5	2	1	1									
Max	2	1	1									

Course Name	MicrowaveandAntennas
Course Code	18EC63
Course Outcomes (COs): At the end of the course the student will be able to:	
C312.1	Describe the use and advantages of microwave generation and transmission using reflexklystronandAnalyzetheparametersrelatedtomicrowavetransmissionlinesandwaveguides
C312.2	AnalyzeSmatrixrepresentationforMulti-PortNetworksandIdentifymicrowavedevicesforseveral applications.
C312.3	Understandstriplinesincoplanartransmissionlinesandapplythebasicparametersofantennato determinedirectivity of radiation patternsinterms ofbeamwidth.
C312.4	AnalyzeisotropicpointsourcesinanarraysystemanddesignanarrayantennaforNisotropicsources. Derive theexpression for radiationpatterns ofvariousantennae
C312.5	Distinguishtheantennas(Wire,ApertureandArrayAntennas)accordingtotheapplications.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C312.1	3	2	1									
C312.2	3	2	1									
C312.3	3	2	1									
C312.4	3	2	1									
C312.5	3	2	1									
Max	3	2	1									

Course Name	Operating Systems
Course Code	18EC641
Course Outcomes (COs): At the end of the course the student will be able to:	
C313.1	Understand the services provided by an operating system.
C313.2	Explain how processes are synchronized and scheduled.
C313.3	Understanddifferent approaches of memory management and virtual memory management.
C313.4	Describe the structure and organization of file system.
C313.5	Understand interprocess communication and deadlock system.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C313.1	2	2										
C313.2	2	2										
C313.3	2	2										
C313.4	2	2										
C313.5	2	2										
Max	2	2										

Course Name	Supply Chain Management
Course Code	18ME653
Course Outcomes (COs): At the end of the course the student will be able to:	
C314.1	Understandandexplainthesupplychainimportance,keydecisionsandbusinessstrategiesto improveperformanceand reducecost.
C314.2	Interprettheoreticallogicformakeversusbuydecisionstoselectsupplierbyidentifyingcoreprocesses to createaworld-classsupply base.
C314.3	Plan warehouse management system by controlling material handling, transportationand traffic management. Also, design an effective distribution network with a modelfacilitylocation andcapacity allocations.
C314.4	MakeuseofNetworkoptimizationmodel,decisiontreesto reducetheimpactofuncertaintyon network design.
C314.5	Explaintheintegrationofinformationtechnologywithsupplychainfortheeffectiveforecasting and reduceduncertainty for agilesupply chainmanagement.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C314.1										2	2	2
C314.2										2	2	2
C314.3										2	2	2
C314.4										2	2	2
C314.5										2	2	2
Max										2	2	2

Course Name	EmbeddedSystemsLab
Course Code	18ECL66

Course Outcomes (COs): At the end of the course the student will be able to:

C315.1	Understandtheinstructionsetof32-bitARMCortexM3andtheKeilIDEforprogramminginAssembly and Embedded C language.
C315.2	DevelopEmbeddedCprogramtodisplaymessageonLCDusingUART&generatePWM,interfaceDAC.
C315.3	DevelopEmbeddedCprogramtointerfaceCortexM3toLED's,7segmentdisplay&tocontrolDC, Stepper Motor.
C315.4	DevelopEmbeddedC programstointerfacetemperaturesensors(LM35)usingSPIADC,Hex keypad.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C315.1	3	2	2	2	2							
C315.2	3	2	2	2	2							
C315.3	3	2	2	2	2							
C315.4	3	2	2	2	2							
Max	3	2	2	2	2							

Course Name	Communication Lab
Course Code	18ECL67

Course Outcomes (COs): At the end of the course the student will be able to:

C316.1	Designandtesttheanaloganddigital modulationcircuitsanddisplaythewaveforms.
C316.2	Understandthemicrowavesignalmeasurement,themicrowavedevicesand variousantennas.
C316.3	Simulatethedigitalmodulationsystemsandcomparetheerrorperformanceofbasicdigitalmodulation schemes.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C316.1	2	2	2						2			
C316.2	2	2	2						2			
C316.3	2	2	2						2			
Max	2	2	2						2			

Course Name	Mini-Project
Course Code	18ECMP68

Course Outcomes (COs): At the end of the course the student will be able to:

C317.1	Applytheknowledge,identifyandcollectinformationtodeduce a problemstatementforMiniproject through discussion.
C317.2	Identifytheapplicable toolsto designand developsolution fortheProposedProblem.
C317.3	EffectivelyDocumentandpresenttheworkwithprofessionalethicsasanindividualorworking asateam.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C317.1	3	3	3	3	3	3	3	2	3	3	2	2
C317.2	3	3	3	3	3	3	3	2	3	3	2	2
C317.3	3	3	3	3	3	3	3	2	3	3	2	2
Max	3	3	3	3	3	3	3	2	3	3	2	2

CourseTitle	ComputerNetworks
CourseCode	18EC71

Courseoutcomes(COs): Attheendofthecoursethestudentwillbeableto:

C401.1	UnderstandthelayeringarchitectureofOSIreferencemodelandTCP/IPprotocolsuite.
C401.2	UnderstandtheoperationandServicesofDataLinkLayer,identifythe Media AccessControlandarchitecturalcomparisonofWirelessLAN.
C401.3	ComprehendtheNetworkLayerAddressing,ProtocolsandApplytheUnicastRoutingProtocols.
C401.4	Recognizetransportlayerservicesinacomputercommunicationnetwork.
C401.5	UnderstandApplicationLayerfunctionsandProtocol.

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COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C401.1	3	3										
C401.2	3	3										
C401.3	3	3										
C401.4	3	3										
C401.5	3	3										
Max	3	3										

Course Title	VLSIDesign
CourseCode	18EC72
Courseoutcomes(COs):Attheendofthecoursethestudentwillbeableto:	
C402.1	DemonstrateunderstandingofMOStransistortheory,analyseideal,non-ideal,transfercharacteristicsofCMOSinverter.
C402.2	UnderstandCMOSfabricationflow,technologyscalinganddrawthebasicgatesusingstick &layoutdiagramswithknowledgeofphysicaldesignaspects.
C402.3	DemonstratetheabilitytodesignCombinationalcircuits.
C402.4	DemonstratetheabilitytodesignSequential&Dynamiclogiccircuits.
C402.5	InterpretmemoryelementsalongwithtimingconsiderationsandTestabilityissuesinVLSI Design.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C402.1	2	2										
C402.2	2	2										
C402.3	2	2										
C402.4	2	2										
C402.5	2	2										
Max	2	2										

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CourseTitle	Digital Image Processing
CourseCode	18EC733
Courseoutcomes(COs):Attheendofthecoursethestudentwillbeableto:	
C403.1	Understandthefundamentals of digital image processing.
C403.2	Understandtheimage transforms used in digital image processing.
C403.3	Understand the image enhancement used in digital image processing.
C403.4	Understand the image restoration techniques used in digital image processing
C403.5	Understandthe morphological operations used in digital image processing.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C403.1	3	2										
C403.2	3	2										
C403.3	3	2										
C403.4	3	2										
C403.5	3	2										
Max	3	2										

CourseTitle	Multimedia Communication
CourseCode	18EC743
Courseoutcomes(COs):Attheendofthecoursethestudentwillbeableto:	
C404.1	Understandtheimportance of multimedia in today's online and offline information sources and repositories.
C404.2	Understand how the text, audio image and video information can be processed transmitted and stored efficiently.
C404.3	Understand the multimedia transport in wireless networks.
C404.4	Understand the real time multimedia network applications.
C404.5	Understandthe different network layer based applications.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C404.1	2	2										
C404.2	2	2										
C404.3	2	2										
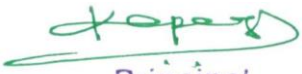
C404.4	2	2										
C404.5	2	2										
Max	2	2										

CourseTitle	PythonApplicationProgramming
CourseCode	18CS752
Courseoutcomes(COs):Attheendofthecoursethestudentwillbeableto:	
C405.1	ExaminePythonsyntaxandsemanticsandbefluentintheuseofPythonflowcontrol andfunctions.
C405.2	DemonstrateproficiencyinhandlingStringsandFileSystems.
C405.3	Create, run andmanipulate PythonPrograms usingcoredata structureslike Lists,Dictionariesanduse RegularExpressions.
C405.4	InterprettheconceptsofObject-OrientedProgrammingasusedinPython.
C405.5	Implementexemplary applications related to Network Programming, Web ServicesandDatabasesinPython.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C405.1	2	2	2									
C405.2	2	2	2									
C405.3	2	2	2									
C405.4	2	2	2									
C405.5	2	2	2									
Max	2	2	2									

CourseTitle	ComputerNetworksLaboratory
CourseCode	18ECL76
Courseoutcomes(COs):Attheendofthecoursethestudentwillbeableto:	
C406.1	DesignandSimulatetheNetwork,protocolsforgivenspecification.
C406.2	Demonstrate the working of given protocol and algorithm using C/C++ programmin g.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C406.1	2	2										
C406.2	2	2										
Max	2	2										

CourseTitle	VLSILaboratory
CourseCode	18ECL77

Courseoutcomes(COs):Attheendofthecoursethestudentwillbeableto:

C407.1	Design,simulatebasicCMOScircuitslikeinverter,commonsourceamplifierand differentialamplifier.
C407.2	DesignlayoutsandperformphysicalverificationofCMOSdigitalcircuits.
C407.3	Design,simulatedigitalcircuitsusingVerilogHDLandunderstandthesynthesisprocessusingtheEDAtool.
C407.4	EvaluatethesynthesisreportstoobtainoptimumgatelevelnetlistbyperformingASICdesignflow.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C407.1	3	3	3	1	3							
C407.2	3	3	3	1	3							
C407.3	3	3	3	1	3							
C407.4	3	3	3	1	3							
Max	3	3	3	1	3							

Course Title	ProjectWorkPhase-1
Course Code	18ECP78

Course outcomes(COs):Attheendofthecoursethestudentwillbeableto:

C408.1	Applytheknowledge,identifyandCollectinformationtodeduceaproblemdefinitionforproject throughdetailedreview.
C408.2	Identifyapplicabletoolstoimplementandexhibittheproposedproject

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C408.1	3	3	3	3	3	3	3	2	3	3	2	2
C408.2	3	3	3	3	3	3	3	2	3	3	2	2
Max	3	3	3	3	3	3	3	2	3	3	2	2

CourseTitle	WirelessandCellularCommunication
CourseCode	18EC81

Courseoutcomes(COs):Attheendofthecoursethestudentwillbeableto:

C409.1	Understandtheconceptofcellularcommunicationandfactorseffectingmobileradiopropagation.
C409.2	DescribeGSMsystemarchitectureandGSMsystemoperations.
C409.3	UnderstandthebasicCDMAsystemarchitectureandCDMAsystemoperations.
C409.4	Understandthenetworkarchitectureandtoidentifythemulticarriermodulation.
C409.5	DescribethemultipleaccessschemeandtheLTEchannelstructure.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C409.1	2	2										
C409.2	2	2										
C409.3	2	2										
C409.4	2	2										
C409.5	2	2										
Max	2	2										

Course Title	NetworkSecurity
Course Code	18EC821
Course outcomes(COs):Attheendofthecoursethestudentwillbeableto:	
C410A.1	UnderstandingtheconceptsofComputerattacksanditssecurity
C410A.2	Identifythethreatsinwebandapplythecountermeasuresavailabletoenhance thesecurityofwebapplicationsandapply
C410A.3	Illustrate theIP securitypolicyand itsmodes, SÁ, AH, ESP,CombiningsecurityAssociationsInternetkeyexchange.
C410A.4	UnderstandtheintrudersandintrusiondetectionandIllustratevirusrelatedthreats
C410A.5	Toidentifytheneedforfirewallandunderstandthecharacteristics,typesanditsconfiguration

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C410A.1	3	2										
C410A.2	3	2										
C410A.3	3	2										
C410A.4	3	2										
C410A.5	3	2										
Max	3	2										

CourseTitle	ProjectWorkPhase-II
CourseCode	18ECP83
Courseoutcomes(COs):Attheendofthecoursethestudentwillbeableto:	
C411.1	Designanddevelopsustainablesolutionforthebettermentofsociety
C411.2	Developafeasiblesystemwithscopeforfutureenhancementsandcontinuous lifelonglearning
C411.3	Effectivelypresenttheworkwithprofessionalethicsasanindividualorworkingas ateam.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C411.1	3	3	3	3	3	3	3	2	3	3	2	2
C411.2	3	3	3	3	3	3	3	2	3	3	2	2
C411.3	3	3	3	3	3	3	3	2	3	3	2	2
Max	3	3	3	3	3	3	3	2	3	3	2	2

CourseTitle	TechnicalSeminar
CourseCode	18ECS84
Courseoutcomes(COs):Attheendofthecoursethestudentwillbeableto:	
C412.1	IdentifyandreviewresearchliteratureandcomprehendsolutionsthatexisttoECE problems.
C412.2	Understandthetechniques,skillsanduseapplicabletoolsnecessaryforpresentingtheau thorizedwork.
C412.3	Communicate effectively on contemporary areas/trends/developments in Engineeringfieldsanddeveloptechnicalreports.
C412.4	Effectivelypresenttheworkwithprofessionalethicsasanindividual.
C412.5	Understandtheimpactofauthorizedworkinsocietalandenvironmentalcontext.

COs	CO-PO Mapping											
	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C412.1	2	2		2	1			2	2	3	1	1
C412.2	2	2		2	1			2	2	3	1	1
C412.3	2	2		2	1			2	2	3	1	1
C412.4	2	2		2	1			2	2	3	1	1
C412.5	2	2		2	1			2	2	3	1	1
Max	2	2		2	1			2	2	3	1	1

CourseTitle	Internship
CourseCode	18ECI85
Courseoutcomes(COs):Attheendofthecoursethestudentwillbeableto:	
C413.1	Enhancetheexistingengineeringknowledgeandgainpracticalexperience.
C413.2	Understandthroughanintensiveexperience,thenatureofworkplacesandtheirassociatedvalues,routinesandcultures.
C413.3	Integrateanddemonstrateexistingandnewtechnicalknowledgeforindustrial application
C413.4	Effectivelypresentandwritetechnicalreportswithprofessionalethicsasanindividual/ Teamoncontemporaryareas/trends/developmentsinEngineeringfields.
C413.5	RecognizetheneedforlifelonglearningprocesseswithManagementskills throughcriticalreflectionofinternshipexperiences.

COs	CO-PO Mapping											
	POs											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
C413.1	3	2	2	3	2	2	2	2	2	2	2	2
C413.2	3	2	2	3	2	2	2	2	2	2	2	2
C413.3	3	2	2	3	2	2	2	2	2	2	2	2
C413.4	3	2	2	3	2	2	2	2	2	2	2	2
C413.5	3	2	2	3	2	2	2	2	2	2	2	2
Max	3	2	2	3	2	2	2	2	2	2	2	2