JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

Kakinada-533003, Andhra Pradesh, India

B.Tech in Electronics & Communication Engineering

VISION OF THE DEPARTMENT

To remain a symbol of pride in the fields of Electronics and Communication Engineering by producing holistic and diligent Engineers for industrial and societal needs.

MISSION OF THE DEPARTMENT

M1: To produce high quality learners who are globally competitive and professionally challenged in the field of electronics and communication engineering.
M2: To offer educational programmes that imparts inventive knowledge with high levels of ethical and human values.
M3: To provide a platform to acquire and implement innovative ideas in research and development.
M4: To build up the state of art laboratories and centers of excellence in different areas of electronics and communication engineering.
M5: To train the students and faculty to update their knowledge in pioneering technologies to meet industrial requirements.

Electronics and Communication Engineering

PEOs of the Department:

PEO 1: Do extremely well in professional career and higher education by attaining knowledge in mathematical, computing and engineering principles.

PEO 2: Analyze real-life problems, and design systems appropriate to its solutions in the field of electronics and communication engineering that are technically sound, economically feasible, and socially acceptable.

PEO 3: Possess good communication skills and ethical attitude with ability to work in teams and adapt to current trends by engaging in lifelong learning.

POs of the Department:

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance : Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PSOs of the Department:

PSO 1: To improve the quality of Human existence, analyze and create electronic electrical circuits and communication systems.

PSO 2: To develop cutting-edge, environmentally mindful technologies to ensure human survival.

PSO 3: To train students for the design and testing of Electronic system devices.

PSO 4: To Analyze, Design, Simulate and Implement computer hardware/software and use basic analog/digital circuits, VLSI Design electronic systems for various computing and communication system, Intra and Inter disciplinary applications.

IB.TechISemester

R19BS1101 :**MATHEMATICS-I**

CourseOutcomes: At theend ofthe course, thestudent willbe ableto

- utilizemeanvaluetheoremstoreallifeproblems
- solvethedifferentialequationsrelatedtovariousengineeringfields
- familiarizewithfunctionsofseveralvariableswhichisusefulinoptimization
- applydouble integrationtechniques inevaluatingareasbounded byregion
- studentswillalsolearnimportanttoolsofcalculusinhigherdimensions.Studentswillbecom efamiliarwith 2- dimensionaland 3-dimensionalcoordinatesystems
- concludetheuseofspecialfunctioninmultipleintegrals

R19BS1103: **APPLIEDCHEMISTRY**

CourseOutcomes: ***At theend of thisunit,thestudentswill be ableto***

- ***Synthesize***nanomaterialsformodernadvancesofengineeringtechnology.
- ***Summarizethe***preparationofsemiconductors;analyzetheapplicationsofliquidcrystalsan d superconductors.
- ***Analyze***theprinciplesof differentanalyticalinstrumentsandtheirapplications.
- ***Design***models forenergybydifferent naturalsources.

CourseCode: **CommunicativeEnglish**

Attheend ofthe module, thelearners willbe able to

- understandsocialortransactionaldialoguesspokenbynativespeakersofEnglishandidentif ythecontext, topic, and pieces of specificinformation
- askandanswer generalquestionsonfamiliartopicsandintroduceoneself/others
- employsuitablestrategiesforskimmingandscanningtogetthegeneralideaofatextandlocat e specificinformation
- recognizeparagraphstructureandbeabletomatchbeginnings/endings/headingswithpara graphs
- formsentencesusingproper grammaticalstructuresandcorrectwordforms.

R19ES1201: **PROGRAMMINGFORPROBLEMSOLVINGUSINGC**

CourseOutcomes:At theend ofthecourse,student willbe ableto

- To convert flowcharts/algorithms to C Programs, compile and debug programs
- To use different operators, data types and write programs that use two-way/ multiway selection
- To select the best loop construct for a given problem
- Understandstheuseofconcepts loops
- Applyconceptstosolverealworldproblems
- Developmultithreadedprogramsusingsynchronizationconcept. Understandstheconceptofpackagesandexceptionhandlingmechanism

CourseCode:**PROGRAMMINGFORPROBLEMSOLVINGUSINGCLab**

- COURSEOUTCOMES:To write algorithms and to draw flowcharts for solving problems
- To convert flowcharts/algorithms to C Programs, compile and debug programs
- To use different operators, data types and write programs that use two-way/ multiway selection
- To select the best loop construct for a given problem
- To design and implement programs to analyze the different pointer applications
- To decompose a problem into functions and to develop modular reusable code
- To apply File I/O operations

IB.TechIISemester

R19BS1201 :**MATHEMATICS-II**

CourseOutcomes: Atthe endofthecourse,the studentwillbe ableto

- developtheuseof matrixalgebratechniques thatisneeded byengineers for practicalapplications
- solvesystemoflinearalgebraicequations usingGausselimination, GaussJordan,GaussSeidel
- evaluatetheapproximaterootsofpolynomialandtranscendentalequationsbydifferentalgorithms
- applyNewton'sforward&backwardinterpolationandLagrange'sformulaeforequalandunequal intervals
- applynumericalintegral techniquestodifferent Engineeringproblems

applydifferentalgorithmsforapproximatingthesolutionsofordinarydifferentialequationswith initialconditions toits analyticalcomputations

R19BS1203: **APPLIEDPHYSICS**

Thestudents will beable to

Explaintheneedofcoherentsourcesandtheconditionsforsustainedinterference
Identifyengineeringapplicationsofinterference
Analyzethedifferencesbetweeninterferenceand diffractionwithapplications
Illustratetheconceptofpolarizationoflightanditsapplications
Classifyordinarypolarizedlightand extraordinarypolarizedlight

R192104 **OBJECTORIENTEDDESIGN&PROGRAMMING USINGJAVA**

CourseOutcomes:At theend ofthecourse,student willbe ableto

- Understandstheuseof OOPconcepts
- ApplyOOP concepts to solve real world problems
- Developmultithreadedprogramsusingsynchronizationconcept.
- Understandsthe concept ofpackagesandexceptionhandlingmechanism.
- DesignGUIbasedapplications usingAWT

R19ES1104 :**BASICELECTRICALENGINEERING**

CourseOutcomes:At theend ofthecourse,student willbe ableto

CO1 ExplaintheoperationofDCgeneratorandanalyzethecharacteristicsof DCgenerator.
CO2 Explaintheprincipleofoperationof DCmotorandanalyzetheir characteristics.Acquiretheskillstoanalyzethestartingandspeedcontrolmethodsof DC motors.
CO3 Abilitytoanalyzetheperformanceandspeed-torquecharacteristicsofa 3-phaseinductionmotorof3phaseinductionmotor.
CO4 Ableto explainthe operationofsynchronous machines.
CO5 Capabilitytounderstand theoperationofvariousspecial machines.

R19ES1108 **ELECTRONICWORKSHOPLab**

- CourseOutcomes: Know the construction, working principle of rectifiers with and without filters with relevant expressions and necessary comparisons.
- Understand the construction, principle of operation of transistors, BJT and FET with their V-I characteristicsin different configurations.

R19BS1204 **AppliedPhysicsLaboratory**

CourseOutcomes:At theend ofthecourse,student willbe ableto

- The knowledge of Physics relevant to engineering is critical for converting ideas into technology.
- An understanding of Physics also helps engineers understand the working and limitations of existing devices and techniques, which eventually leads to new innovations and improvements.
- In the present course, the students can gain knowledge on the mechanism of physical bodies upon the action of forces on them, the generation, transmission and the detection of the waves, Optical Phenomena like Interference, diffraction, the principles of lasers and Fibre Optics.
- Various chapters establish a strong foundation on the different kinds of characters of several materials and pave a way for them to use in at various technical and engineering applications.

R19MC1201 :**ConstitutionofIndia**

- Know the role of the Election Commission apply knowledge

- Contrast and compare the role of Chief Election commissioner and Commissiononerate
- Analyze the role of the state election commission
- Evaluate various commissions of viz SC/ST/OBC and women.

CourseOutcomes:

- ToEnablethestudenttounderstandtheimportanceofconstitution
- Tounderstandthestructureof executive,legislatureandjudiciary
- Tounderstandphilosophyoffundamentalrightsandduties
- To understand the autonomous nature of constitutional bodies like Supreme Courtand high court controller and auditor general of India and election commission ofIndia.
- Tounderstandthecentral andstaterelationfinancialandadministrative

IIYear-ISemester

R192101 **ElectronicsDevicesandCircuits**

CourseOutcomes:

Attheendofthiscoursethestudentwillbeableto

- Applythebasicconceptsofsemiconductorphysics.
- Understand the formation ofp-n junction and how it canbe used as a p-n junction as diode indifferent modes of operation.
- Know the construction, working principle of rectifiers with and without filters with relevant expressions and necessary comparisons.
- Understand the construction, principle of operation of transistors, BJT and FET with their V-I characteristicsin different configurations.
- Know the needof transistor biasing,various biasingtechniquesfor BJTandFETandstabilizationconcepts with necessary expressions.
- Performthe analysis ofsmallsignal low frequencytransistor amplifier circuits using BJT and FET in different configurations.

R192102:**SWITCHINGTHEORYandLOGICDESIGN**

CourseOutcomes:

- Classifydifferent numbersystemsandapplytogeneratevariouscodes.
- UsetheconceptofBooleanalgebrainminimizationofswitchingfunctions
- Designdifferenttypesofcombinationallogiccircuits.
- Applyknowledgeofflip-flopsindesigning ofRegistersand counters
- Theoperationanddesignmethodologyforsynchronoussequentialcircuitsandalgorithmicstatemachines.
- Produceinnovativedesignsbymodifyingthetraditionaldesigntechniques

R192103 **SIGNALSandSYSTEMS**

CourseOutcomes: Attheendofthiscoursethestudentwillableto:

- Differentiatethevariousclassificationsofsignalsandsystems
- Analyzethefrequencydomainrepresentationofsignalsusing Fourierconcepts
- Classifythesystemsbasedontheirpropertiesand determinetheresponseofLTI Systems.
- Knowthesamplingprocessandvarioustypesofsampling techniques.
- ApplyLaplaceandz-transformstoanalyzesignalsandSystems(continuous&discrete).

R192104 **OBJECTORIENTEDDESIGN&PROGRAMMINGUSINGJAVA**

CourseOutcomes:Attheendofthecourse,student willbeable to

- UnderstandstheuseofOOPconcepts
- ApplyOOPconceptstosolverealworldproblems
- Developmultithreadedprogramsusingsynchronizationconcept.
- Understandstheconceptofpackagesandexceptionhandlingmechanism.
- DesignGUIbasedapplicationsusingAWT

R192105: **RANDOMVARIABLESandSTOCHASTICPROCESSES**

CourseOutcomes:

Aftercompletionofthecourse,thestudentwillbeableto

- Mathematicallymodeltherandomphenomenaandsolvesimpleprobabilistic problems.
- Identifydifferent typesofrandomvariablesandcomputestatisticalaveragesofthese random variables.
- Characterizetherandomprocessesinthetimeandfrequencydomains.

AnalyzetheLTIsystemswithrandominputs

R192106 **COMPUTERARCHITECTUREandORGANIZATION**

CourseOutcomes:

- Studentscanunderstandthearchitectureofmoderncomputer.
- TheycananalyzethePerformanceofacomputer using performanceequation
- Understandingofdifferentinstructiontypes.
- Studentscancalculatetheeffectiveaddressofanoperand byaddressingmodes
- Theycanunderstandhowcomputerstorespositiveandnegativenumbers.

UnderstandtheconceptsofI/OOrganizationandMemorysystems

R192107 **ELECTRONICDEVICESANDCIRCUITSLAB**

COURSEOUTCOMES:

- Designtheamplifiercircuitsusingvariousbiasingmethods.
- AnalyzethesinglestageandmultistageBJTamplifiersusingsmallsignalequivalentmodel.

- AnalyzeJFETamplifiersusingsmallsignalequivalent model.
- AnalyzeMOSFETamplifiersusingsmallsignalequivalentmodel.
- Determinethefrequencyresponseofsinglestageandmultistageamplifiers.
- Designandfaultanalyzedcpowersupplies.

R192108 **SWITCHINGTHEORYandLOGICDESIGNLAB**
COURSEOUTCOMES

CO1 UnderstandingworkingandimportanceBasicLogicGatesandBooleanfunctionsusing Gates
CO2 ImplementationofCombinationalCircuitswithFourVariables
CO3 Analyzetheconceptofrealizationoffunctionswith Decoders,Multiplexersetc
CO4 UnderstandtheconceptofFlip-FlopandtheirrealizationusingGates
CO5 DesigningofShiftRegistersCounters
CO6 Evaluate&DrawLogicDiagramsfordifferentMODCounters
CO7 DevelopRealtimeapplicationusingDigitalElectronics

R192109 **ObjectOrientedDesign&ProgrammingusingJava lab**
COURSEOUTCOMES

- Abletowriteprogramsforsolvingrealworldproblemsusingjavacollectionframework.
- Abletowriteprogramsusingabstract classes.
- Abletowriteprogramsusinginheritance, exceptionhandling,polymorphism.

Abletowritemultithreadedprograms

IIYear-IISemester

R192203 :**ELECTRONICCIRCUITANALYSIS**

CourseOutcomes:

Attheendofthiscoursethestudentcanableto

- Designandanalysisofsmallsignalhighfrequencytransistoramplifier usingBJTandFET.
- DesignandanalysisofmultistageamplifiersusingBJTandFETandDifferentialamplifierusingBJT.
- Derivetheexpressionsfor frequencyofoscillationandconditionforoscillationofRCand LCoscillators and their amplitude and frequency stability concept.
- Knowtheclassificationofthepowerandtunedamplifiersandtheiranalysiswithperformancecomparison.

R192204: **CONTROLSYSTEMS**

CourseOutcomes:

- Thiscourseintroducestheconceptsoffeedback anditsadvantagestovariouscontrolsystems
- Theperformancemetricstodesignthecontrolsystemintime-domainandfrequencydomainareintroduced.
- Controlsystemsforvariousapplicationscanbedesignedusingtime-domainandfrequencydomainanalysis.
- In addition to the conventional approach, the state space approach for the analysis of control systems is also introduced.

R192205: **ElectromagneticWavesandTransmission Lines**

CourseOutcomes:

Attheendofthiscoursethestudentcanableto

- DetermineEandHusingvariouslawsandapplicationsofelectric&magneticfields
- ApplytheMaxwellequationstoanalyzethetimevaryingbehaviorofEMwaves

- Gaintheknowledge inuniformplanewaveconcept andcharacteristicsofuniformplanewave invarious media
- CalculateBrewsterangle, criticalangleandtotalinternalreflection
- DeriveandCalculatetheexpressions forinput impedanceoftransmissionlines,reflectioncoefficient,VSWR etc. using smith chart

R192206 **ANALOGCOMMUNICATIONS**

CourseOutcomes:

Afterundergoingthecourse,studentswillbeableto

- DifferentiatevariousAnalogmodulationanddemodulationschemesandtheirspectralcharacteristics
- Analyzenoisecharacteristicsofvariousanalogmodulationmethods
- Analyzevariousfunctionalblocksofradiotransmittersandreceivers

Designsimpleanalogsystemsforvariousmodulationtechniques

R192207 **ELECTRONICCIRCUITANALYSISLAB**

CourseOutcomes:

After learningthecourse,thestudentwillbeabletoperformsimulationusingMultisimsoftwareand verifywith relevant hardware components:

CO1: Find thethresholdfrequency'f'tofagiventransistor.

CO2: Design voltage series and current shunt feedback amplifiers and obtained its frequency responses.

CO3: Design RC oscillators (Phase shift/Wien bridge) and LC oscillators (Hartley/Colpitt's) and find its oscillation frequency.

CO4: DesigntwostageRCCoupledamplifier andobtainitsfrequencyresponses.

CO5: Findvoltagegain,currentgainandinputimpedanceofDarlingtonpairand bootstrap emitter follower.

CO6: ConstructandCalculateefficiencyofpoweramplifiers(Class-AandClass-B).

CO7: DesignTunedVoltageamplifiersand find itsresonantfrequency.

R192208 :**ANALOGCOMMUNICATIONSLAB**

CourseOutcomes

Uponsuccessfulcompletionofthecourse,thestudent will beableto

CO1:AnalysedifferentparametersofAnalogmodulationtechniques

CO2 : Analyse different parameters of pulse modulation techniques

CO3 : Study various parameters of Radio Receivers.
CO4:DesignandConstructRadioReceiversontheir own

IIIYear-I Semester

R193101 :**INTEGRATEDCIRCUITSANDAPPLICATIONS**

CourseOutcomes:

- Designcircuitsusingoperationalamplifiersforvariousapplications.
- Analyzeanddesignamplifiersandactivefiltersusing Op-amp.
- Diagnoseandtrouble-shootlinearelectroniccircuits.
- Understandthegain-bandwidthconceptandfrequencyresponseoftheamplifierconfigurations.

Understandthoroughlytheoperationalamplifiers withlinearintegratedcircuits

R193102 **MICROPROCESSORSANDMICROCONTROLLERS**

CourseOutcomes:

Aftergoingthroughthiscoursethestudentwillbeableto

No.	CourseOutcomes
CO1	Understandthefundamentals,differentaddressingmodesandDevelopprogrammingskills
CO2	Perform8086interfacingwithdifferentperipheralsandimplementprograms
CO3	Describethekeyfeaturesofserialandparallelcommunicationandabletounderstand advanced microprocessors
CO4	Designamicrocontrollerforsimpleapplications,programmingandinterfacingof8051

R193103 :**DIGITALCOMMUNICATIONS**

CourseOutcomes:

Afterundergoingthecoursestudentswillbeableto:

- Determinetheperformanceofdifferent waveformcodingtechniquesforthegenerationanddigital representation of the signals.
- Determinetheprobabilityoferrorforvariousdigitalmodulationschemes
- Analysedifferentsourcecodingtechniques

Computeandanalysedifferent errorcontrolcodingschemes forthereliabletransmissionofdigital information over the channel

R193104 **ANTENNAandWAVEPROPAGATION**

CourseOutcomes:

CO. No	
EC312.1	Identifybasicantenna parameters
EC312.2	Designand analyze wireantennas, loop antennas, reflector antennas, lens antennas, horn antennas and microstrip antennas
EC312.3	Quantifythefieldsradiatedbyvarioustypesofantennas
EC312.4	Analyzeantennameasurementstoassessantenna'sperformance
EC312.5	Identifythecharacteristicsofradiowavepropagation
EC312.6	Designandanalyzeantennaarrays

R193105b :**ELECTRONICMEASUREMENTSANDINSTRUMENTATION**

CourseOutcomes:

Thestudentwillbeableto

- Selecttheinstrumenttobeusedbasedontherequirements.
- Understandandanalyzedifferentsignalgeneratorsandanalyzers.
- Understandthedesignofoscilloscopesfordifferent applications.
- Designdifferenttransducersformeasurementofdifferentparameters.

R193106 :I**NTEGRATEDCIRCUITSandAPPLICATIONSLAB**

CourseOutcomes:

CO1:Design and analyze the various linear application of op-amp.
CO2:Designandanalyzethevariousnon-linearapplicationofop-amp.
CO3 : Design and analyze filter circuits using op-amp
CO4:Designandanalyzeoscillatorsandmultivibratorcircuitsusingop-amp
CO5: Design and analyze the various application of 555 timer.
CO6:Analyzetheperformanceofoscillatorsandmultivibratorsusingtrainerkits.

R193107 **DIGITALCOMMUNICATIONSLAB**

CourseOutcomes:

CO1	ExperimentwiththeprincipleofPCM,DPCM,DM,FDMandTDM
CO2	Implementdifferentdigitalcarriermodulationanddemodulationschemes
CO3	AnalyzeSpectralcharacteristicsofPulse Modulations
CO4	EvaluatetheSourceCodingtechniquesfordifferentExamples
CO5	Analyzetheperformanceofabasebandandpassbanddigitalcommunication system in terms of error rate and spectral efficiency
CO6	UnderstandtheConceptofcompressionanddecompression
CO7	Applytheconceptofchannelcodingtechniquesinrealtimeapplications

R193108 **MICROPROCESSORSandMICROCONTROLLERSLAB**

CourseOutcomes:

Afterlearningthecourse,thestudentwillbeable:

CO.No	Description
EC326.1	Understandthefundamentalsofassemblylevelprogramming of microprocessors & microcontrollers
EC326.2	Applytheprogramingknowledgeforarithmeticand logical operations in 8086 & 8051
EC326.3	Applytheprogramingknowledgeforarithmeticand logical operations in8051
EC326.4	Developtheprograms forsorting
EC326.5	Developtheprogramsforstringmanipulationprograms
EC326.6	Contrast how different I/O devices can be interfaced to processorandwillexploreseveraltechniquesofinterfacing.
EC326.7	Applytheprogramingknowledgeforunderstandingof communication standards in 8086
EC326.8	Applytheprogramingknowledge forunderstandingof communication standards in8051

IIIYear-IISemester

R193201: **INTERNETOFTHINGS**

CourseOutcomes:

Thestudentwillbeableto:

CO. No	**Description**
EC321.1	UnderstandinternetofThingsanditshardwareandsoftware components.
EC417.2	InterfaceI/Odevices,sensors&communication modules.
EC417.3	Remotelymonitor dataandcontroldevices.
EC417.4	DesignrealtimeIoTbasedapplications

R193202 : **VLSIDESIGN**

CourseOutcomes:

Aftergoingthroughthiscoursethestudentwillbeableto

CO1	ApplytheConceptofdesignrules duringthelayoutofacircuit.
CO2	ModelandsimulatedigitalVLSIsystemsusinghardwaredesignlanguage.
CO3	SynthesizedigitalVLSIsystemsfromregister-transferorhigherleveldescriptions
CO4	Understandcurrenttrendsinsemiconductortechnology,andhowitimpactsscaling and performance.

C05 DifferentiatevariousFPGACPLDArchitectures

R193203:**DIGITALSIGNALPROCESSING**

CourseOutcomes:
Aftergoingthroughthiscoursethestudentwillbeableto

CO1 Applythedifferenceequationsconceptintheanayziationof Discretetime systems.
CO2 UsetheFFTalgorithmforsolvingtheDFT ofagivensignal.
CO3 DesignaDigitalfilter(FIR&IIR)fromthegivenspecifications.
CO4 RealizetheFIRandIIRstructuresfromthedesigneddigitalfilter.
CO5 ApplythesignalprocessingconceptsonDSPProcessor.

R193205a : **DIGITAL IC DESIGN**

CourseOutcomes:

Aftergoingthroughthiscoursethestudentwillbeableto

- UnderstandtheconceptsofMOSDesign.
- DesignandanalysisofCombinationalandSequentialMOSCircuits.
- ExtendtheDigitalICDesigntoDifferentApplications.
- UnderstandtheConceptsofSemiconductorMemories,FlashMemory,RAMarrayorganization.

R193205b :**ELECTROMAGNETICINTERFERENCE&COMPATIBILITY**

CourseOutcomes
Attheendofthis Course,

- StudentsshallbeabletodistinguisheffectsofEMIandcountermeasuresbyEMC-techniques.
- Studentsshallapplytheknowledgegained inselectingpropergadget/device/appliance/system, asperEMC- norms specified by regulating authorities.
- StudentsshallchoosecareerinthefieldsofEMI/EMCasanEngineer/Researcher/Entrepreneur in India/abroad

R193206a :**ANALOGICDESIGN**

CourseOutcomes:

Aftergoingthroughthiscoursethestudentwillbeableto

- UnderstandtheconceptsofMOSDevicesand Modeling.
- DesignandanalyzeanyAnalogCircuitsinrealtimeapplications.
- ExtendtheAnalogCircuit DesigntoDifferent ApplicationsinRealTime.

UnderstandofOpen-LoopComparatorsandDifferent TypesofOscillators

R193207 :**VLSILAB**

CourseOutcomes:

CO1	DesigningofCombinationalcircuitsusingbackendtools
CO2	Understand&ImplementationControlSignalinLayouts
CO3	Analyzestatictiming,IRdropandCrosstalkindigitalcircuitLayouts
CO4	AnalyzetheACCharacteristicsofAmplifiers&oscillatorsusingVLSIbackendtools
CO5	Applytheconcept ofScalingwhileimplementationoflayouts
CO6	Analyzetheconcept ofDesignRulesin DRC
CO7	EvaluatetheEfficiencyofRouting

R193208 :**DIGITALSIGNALPROCESSINGLAB**

CourseOutcomes:

Onthecompletion ofthislaboratorycourse, thestudentswillbeableto:

1. Understandtheconcepts ofanalogtodigitalconversionofsignalsandfrequencydomainsamplingofsignals.
2. Model the discrete timesignals and systems and verify its properties and results.
3. ImplementdiscretecomputationsusingDSPprocessorandverifytheresults.
4. Realizethedigitalfiltersusingasimulationtoolandanalyzetheresponseofthefilterforanaudiosignal.
5. WriteprogramsusingMatlab/Scilab/OctavetoillustrateDSP concepts.

IVYear-I Semester

R194101 :**OPTICALCOMMUNICATIONS**

CourseOutcomes:

Aftergoingthroughthiscoursethestudentwillbeableto

CO.No	Description
EC414.1	Choosenecessarycomponentsrequiredinmodernoptical communications systems
EC414.2	Design and build optical fiber experiments in the laboratory,andlearnhowtocalculateelectromagnetic modesinwaveguides,theamountoflightlostgoing throughanopticalsystem,dispersionofopticalfibers
EC414.3	Use differenttypesofphotodetectorsandopticaltest equipmenttoanalyzeopticalfiberandlightwavesystems.
EC414.4	Choosetheopticalcablesforbettercommunicationwith minimum losses
EC414.5	Design,build,anddemonstrateopticalfiberexperimentsin the laboratory

R194102 :**MICROWAVEENGINEERING**

CourseOutcomes:

Aftergoingthroughthiscoursethestudentwillbeableto

CO.No	**Description**
EC322.1	Designdifferentmodesinwaveguidestructures
EC322.2	CalculateS-matrixforvariouswaveguidecomponentsand splitting the microwave energy in a desired direction

EC322.3	DistinguishbetweenMicrowavetubesandSolidStateDevices, calculation of efficiency of devices.
EC322.4	Measurevarious microwaveparametersusingaMicrowavetest bench

R194103a :**DATACOMMUNICATIONS&COMPUTERNETWORKS**

CourseOutcomes:

Uponcompletingthiscourse,thestudentwillbeableto

- KnowtheCategoriesandfunctionsofvariousDatacommunicationNetworks
- Designandanalyzevariouserrordetectiontechniques.
- Demonstratethemechanismofroutingthedatainnetworklayer
- KnowthesignificanceofvariousFlowcontrolandCongestioncontrolMechanisms
- KnowtheFunctioningofvariousApplicationlayerProtocols.

R194104a :**DSPPROCESSORSANDARCHITECTURES**

CourseOutcomes:

Uponthecompletionofcourse,studentableto

- UnderstandthebasicconceptsofDigitalSignalProcessing.
- TodifferentiatethearchitecturalfeaturesofGeneralpurposeprocessorsandDSP processors.
- UnderstandthearchitecturesofTMS320C54xxdevicesandADSP2100DSPdevices.
- WritethesimpleassemblylanguageprogramsbyusinginstructionsetofTMS320C54xx.
- TointerfacethevariousdevicestoDSPProcessors.

R194104c: **EMBEDDEDSYSTEMS**

CourseOutcomes:

Aftergoingthroughthiscoursethestudentwill beableto

- Knowbasicsofembeddedsystem,classification,memories,differentcommunication interface and what embedded firmware is and its role in embedded system, different system components.
- Distinguishallcommunicationdevicesinembeddedsystem,otherperipheraldevice.
- DistinguishconceptsofCversusembeddedCandcompilerversuscross-compiler.
- Chooseanoperatingsystem,andlearnhowtochooseanRTOS

R194106 :**MICROWAVEENGINEERING&OPTICALLAB**

Aftergoingthroughthiscoursethestudentwillbeableto

• Design different modes in waveguide structures
• Calculate S-matrix for various waveguide components and splitting the microwave energy in a desired direction
• Distinguish between Microwave tubes and Solid State Devices, calculation of efficiency of devices.
• Measure various microwave parameters using a Microwave test bench

R194107 INTERNETOFTHINGSLAB

COURSEOUTCOMES(Cos)

CO1:Understandtheimportanceofinternetofthingsinpresent scenario. CO2:

Understand the basics of sensors, its functioning.

CO3:ImplementinterfacingofvarioussensorswithArduino/RaspberryPi.

CO4:Designofdirectandalternatingtypeofelectricalinstrumentsusingarduino/RaspberryPi.

CO5: Acquire design thinking capability, abilityto design a component with realistic constraints, to solve real world engineering problems and analyse the results.

CO6:Recognizethe functionalityofmicrocontroller,latestversionprocessorsanditsapplications.

IV Year-II Semester

R194201a :**SATELLITECOMMUNICATIONS**

CourseOutcomes:

Attheend ofthis coursethestudentcan ableto:

1. Understandtheconcepts,applications and subsystemsof Satellitecommunications.
2. Derivetheexpression for G/Tratio and to solvesome analytical problems on satellitelinkdesign.
3. Understandthevarious typesofmultipleaccess techniquesandarchitectureofearth station design.
4. Understandtheconcepts ofGPSanditsarchitecture.

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R194202a **CELLULARandMOBILECOMMUNICATIONS**

Course outcomes:

Attheend ofthis coursethestudentcan ableto:

1. Identifythe limitationsof conventionalmobile telephone systems;understand theconceptsofcellularsystems.
2. Understandthe frequencymanagement,channelassignmentstrategiesand antennasincellularsystems.
3. Understandtheconceptsofhandoffandarchitecturesofvariouscellularsystems.