



S. No.	Course codes	Course Name	Category	Hours per			Credits
				L	T	P	
1.	25A185101	CMOS Digital IC Design	PC	3	0	0	3
2.	25A185102	Microcontrollersand ProgrammableDigital SnpProcessors	PC	3	0	0	3
3.	25A185103a 25A185103b 25A185103c	Program Elective – I Communication Buses and Interfaces Data Acquisition System Design FPGA Architectures and Applications	PE	3	0	0	3
4.	25A185104a 25A185104a 25A185104a	Program Elective – II Low Power VLSI Design Scripting Languages for VLSI Network Security and Cryptography	PE	3	0	0	3
	25A185101P	CMOS Digital IC Design Lab	PC	0	0	4	2
6.	25A185102P	Microcontrollers andProgrammableDigital SignalProcessorsLab	PC	0	0	4	2
7.	25A1RM101	Research Methodology and IPR	MC	2	0	0	2
8.	25A185105a 25A185105b	RTLSynthesis, Simulationand Verification (OR) IoT and RTOS for Embedded Applications	SE	0	1	2	2
9.	25A1AC101a 25A1AC101b 25A1AC101c	Audit Course – I English for research paper writing Disaster Management Indian Knowledge system	AC	2	0	0	0
Total							20

Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

SEMESTER – II

[illegible]

S. No.	Course codes	Course Name	Category	Hours per week			Credits
				L	T	P	
1.	25A158401	Dissertation Phase – II	PR	0	0	32	16
Total							16



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	CMOSDIGITALIC DESIGN	L	T	P	C
		3	0	0	3
Semester		I			
CourseObjectives:					
- To understand the fundamental properties of digital Integrated circuits using basic MOSFET equations and to develop skills for various logic circuits using CMOS related design styles. - Thecoursealsoinvolvesanalysisofperformancemetrics. - ToteachfundamentalsofCMOSDigitalintegratedcircuitdesignsuchasimportanceof Pseudo logic, Combinational MOS logic circuits and Sequential MOS logic circuits. - ToteachthefundamentalsofDynamiclogiccircuitsandbasicsemiconductor memories which are the basics for the design of high performance digital integrated circuits.					
CourseOutcomes(CO):Studentwillbeable to					
- DemonstrateadvancedknowledgeinStaticanddynamiccharacteristicsofCMOS, - EstimateDelayandPowerofAdders circuits. - Classifydifferentsemiconductor memories. - Analyze,designandimplementcombinationalandsequentialMOSlogiccircuits. - AnalyzecomplexengineeringproblemscriticallyinthedomainofdigitalICdesignfor conducting research. - SolveengineeringproblemsforfeasibleandoptimalsolutionsinthecoreareaofdigitalICs					
UNIT-I		LectureHrs:			
MOS Design Pseudo NMOS Logic: Inverter, Inverter threshold voltage, Output high voltage, Output Low voltage, Gain at gate threshold voltage, Transient response, Rise time, Fall time, Pseudo NMOS logic gates, Transistor equivalency, CMOS Inverter logic.					
UNIT-II		LectureHrs:			
CombinationalMOSLogic Circuits: MOSlogic circuits with NMOSloads, Primitive CMOSlogic gates– NOR & NAND gate, Complex Logic circuits design–Realizing Boolean expressions using NMOSgatesandCMOSgates,AOIandOIAgates,CMOSfulladder,CMOStransmissiongates, DesigningwithTransmissiongates.					
UNIT-III		LectureHrs:			
Sequential MOS Logic Circuits: Behavior of bistable elements, SR Latch, Clocked latch and flipflop circuits, CMOS D latch and edge triggered flip-flop					
UNIT-IV		LectureHrs:			
DynamicLogicCircuits:Basicprinciple,VoltageBootstrapping,Synchronousandynamicpass transistorcircuits,DynamicCMOStransmissiongatelogic,HighperformanceDynamicCMOS circuits.					
UNIT-V		LectureHrs:			
Semiconductor Memories: Types, RAM array organization, DRAM – Types, Operation, Leakage currentsinDRAMcellandrefreshoperation,SRAMoperationLeakagecurrentsinSRAMcells, FlashMemory–NORflashandNANDflash.					
Textbooks:					
- NeilWeste,DavidHarris,—CMOSVLSIDesign:ACircuitsandSystemsPerspectiveI,4th Edition, Pearson, 2010 - DigitalIntegratedCircuitDesign–KenMartin,OxfordUniversityPress,2011. - CMOSDigitalIntegratedCircuitsAnalysisandDesign–Sung-MoKang,YusufLeblebici, TMH, 3rd Edition, 2011.					



Dr. K. V. Subba Reddy Institute of Technology **(Autonomous)**

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

ReferenceBooks:

1. Introduction to VLSI Systems: A Logic, Circuit and System Perspective – Ming-BO Lin, CRC Press, 2011
2. Digital Integrated Circuits – A Design Perspective, Jan M. Rabaey, Anantha Chandrakasan, Borivoje Nikolic, 2nd Edition, PHI.



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	MICROCONTROLLERSANDPROGRAMMABLE DIGITAL SIGNAL PROCESSORS	L	T	P	C
		3	0	0	3
Semester		I			
CourseObjectives:					
• TolearnaboutARMMicrocontrollerarchitecturalfeatures • TounderstandtheARM_C‘Programmingforvariousapplications • TostudytheDSPprocessorfundamentalsanditsdevelopmenttools					
CourseOutcomes(CO):Studentwillbeable to					
• LearnaboutARMMicrocontrollerarchitecturalfeatures • UnderstandtheARM_C‘Programmingforvariousapplications • StudytheDSPprocessorfundamentalsanditsdevelopment tools					
UNIT-I	LectureHrs:				
ARM Cortex-Mx Processor: Applications, Programming model – Registers, Operation - modes, Exceptions and Interrupts, Reset Sequence, Instruction Set (ARM and Thumb), Unified Assembler Language,Memory Maps,MemoryAccessAttributes,Permissions,Bit-BandOperations,Unaligned andExclusiveTransfers.Pipeline,BusInterfaces.					
UNIT-II	LectureHrs:				
Exceptions,Types,Priority,VectorTables,InterruptInputsandPendingbehaviour,FaultExceptions,Superv isorandPendableServiceCall,NestedVectoredInterruptController,Basic Configuration,SYSTICKTimer,InterruptSequences,Exits,TailChaining,InterruptLatency.					
UNIT-III	LectureHrs:				
LPC17xxmicrocontroller-Internalmemory,GPIOs,Timers,ADC,UARTandotherserial interfaces,PWM,RTC,WDT.					
UNIT-IV	LectureHrs:				
ProgrammableDSP(P-DSP)Processors:Harvardarchitecture,Multiportmemory,architectural structure of P-DSP- MAC unit, Barrel shifters, Introduction to TI DSP processor family.					
UNIT-V	LectureHrs:				
VLIWarchitectureandTMS320C6000series,architecturestudy,datapaths,crosspaths, IntroductiontoInstructionlevelarchitectureofC6000family,AssemblyInstructionsmemoryaddressing, for arithmetic, logical operations.					
Textbooks:					
1. Joseph Yiu,—ThedefinitiveguidetoARMCortex-M3,Elsevier,2ndEdition 2. VenkatramaniB.andBhaskarM.—DigitalSignalProcessors:Architecture,Programmingand Applications, TMH, 2 nd Edition.					
ReferenceBooks:					
1. SlossAndrewN,SymesDominic,WrightChris,—ARMSystemDeveloper'sGuide:Designingand Optimizing, Morgan Kaufman Publication. 2. Stevefurber,—ARMSystem-on-ChipArchitecture, PearsonEducation 3. FrankVahidandTonyGivargis, —EmbeddedSystemDesign, Wiley 4. Technicalreferencesandusermanualsonwww.arm.com,NXPSemiconductor www.nxp.com and Texas Instruments www.ti.com					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	COMMUNICATIONBUSESANDINTERFACES	L	T	P	C
		3	0	0	3
ProgramElective-I					
Semester		I			
CourseObjectives:					
• Tounderstandtheconceptsofdifferenttypesofserialbuses. • TolearnaboutCAN,PCIeandUSBarchitecture • Tolearnaboutdatastreamingusingserialcommunication protocols					
CourseOutcomes(CO):Studentwillbeable to					
• Understandtheconceptsofdifferenttypesofserialbuses. • LearnaboutCAN,PCIeandUSBarchitecture • Learnaboutdatastreamingusingserialcommunicationprotocols					
UNIT-I					LectureHrs:
SerialBusses-Cables,Serialbusses,serialversusparallel,DataandControlSignal-dataframe,data rate, features, Limitations and applications of RS232, RS485, I2C, SPI					
UNIT-II					LectureHrs:
CAN ARCHITECTURE- ISO 11898-2, ISO 11898-3, Data Transmission- ID allocation, Bittiming, Layers- Application layers, Object layer, Transfer layer, Physical layer, Frame formats- Data frame,Remoteframe,Errorframe,Overloadframe,Ackslot,Interframespacing,Bitspacing, Applications.					
UNIT-III					LectureHrs:
PCIe:Revision,Configurationspace-configurationmechanism,Standardizedregisters,Bus enumeration, Hardware and Software implementation, Hardware protocols, Applications.					
UNIT-IV					LectureHrs:
USB: Transfer Types- Control transfers, Bulk transfer, Interrupt transfer, Isochronous transfer. Enumeration- Device detection, Default state, Addressed state, Configured state, enumeration sequencing.Descriptortypesandcontents-Devicedescriptor,configurationdescriptor,Interface descriptor,Endpointdescriptor,Stringdescriptor.Devicedriver.					
UNIT-V					LectureHrs:
DatastreamingSerialCommunicationProtocol-SerialFrontPanelDataPort(SFPDP) configurations,Flowcontrol,serialFPDPtransmissionframes,fiberframesandcoppercable.					
Textbooks:					
1. AComprehensiveGuidetocontrollerAreaNetwork–WilfriedVoss,CopperhillMedia Corporation, 2nd Ed., 2005.					
2. SerialPortComplete-COMPorts,USBVirtualComPortsandPortsforEmbeddedSystems-Jan Axelson, Lakeview Research, 2nd Ed.,					
ReferenceBooks:					
1. USBComplete–JanAxelson,PenramPublications.					
2. PCIExpressTechnology–MikeJackson,RaviBudruk,MindsharePress.					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	DATAACQUISITIONSYSTEMDESIGN ProgramElective-I	L	T	P	C
		3	0	0	3
Semester		I			
CourseObjectives:					
• Tounderstandthedifferenttypesofcommunicationinterfacebuses. • TofamiliarizedifferentmethodsofADC'sandDAC'scharacteristics, specifications • Tostudythesoftwaretoolstodevelopthecodeandimplementationfordataacquisition system					
CourseOutcomes(CO):Studentwillbeable to					
Studentswillbeableto • Understandthedifferenttypesofcommunicationinterfaceeuses. • FamiliarizedifferentmethodsofADC'sandDAC'scharacteristics,specifications • Studythesoftwaretoolstodevelopthecodeandimplementationfordataacquisition system					
UNIT-I	LectureHrs:				
FundamentalsofDataAcquisitionSystems,SensorsandTransducers,Signalconditioning-Introduction,Typesofsignalconditioning,Classesofsignalconditioning,DAQHardware,DAQ Software, Communications Cabling, Parameters of a DAQ System.					
UNIT-II	LectureHrs:				
Data acquisition system configuration, Computer plug in I/O, Distributed I/O, Stand-alone or distributed loggers/controllers- Introduction, Methods of operation, Stand-alone logger/controller hardware,firmware&softwaredesign,Communicationshardwareinterface,Hostsoftware, Considerations,internalsystems,USBoverallstructure,PCMCIAcard					
UNIT-III	LectureHrs:				
Data Acquisition Systems: Hardware-Introduction, Plug-in DAQ Systems, Converters A/D, Converters D/A, Amplifier, Multiplexer/De-multiplexer, Power Management, Timing System, Filtering, Memory Board, Bus Interface.					
UNIT-IV	LectureHrs:				
Communication Bus-Bus and FireWire, Serial Communications, Wireless, Ethernet and Bluetooth, GSM for Data Acquisition System, PCI and PCI Express, Standard VME.					
UNIT-V	LectureHrs:				
Design of Data Acquisition System: Introduction to the Design, Functional Design of high-Speed Computers-Based DAS, Portable DAS, Design Guidelines for High-Performance Multichannel.SoftwareforDataAcquisitionSystems,IntroductiontoLabVIEW,AndroidforDAQ, Designoffirmware,ExampleofImplementationofaSoftware.					
Textbooks:					
1. MaurizioDiPaoloEmilio—Dataacquisitionsystems-fromfundamentalstoapplieddesign springer, 2013. 2. JohnParkandSteveMackay—PracticalDataacquisitionforinstrumentationandcontrolsystems Elsevier, 2003.					
ReferenceBooks:					
1. RobertHKing,—IntroductiontoDataAcquisitionwithLabVIEW ,2ndedition,2012,McGraw					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	FPGAARCHITECTURESANDAPPLICATIONS	L	T	P	C
	ProgramElective-I	3	0	0	3
Semester		I			
CourseObjectives:					
- ToacquireknowledgeaboutvariousarchitecturesanddevicetechnologiesofPLD's. - TocomprehendFPGAArchitectures. - ToanalyzeSystemlevelDesignandtheirapplicationforCombinationalandSequential Circuits. - TofamiliarizewithAnti-FuseProgrammedFPGAs. - Toapplyknowledgeofthissubjectforvariousdesignapplications.					
CourseOutcomes(CO):Studentwillbeable to					
- AcquireknowledgeaboutvariousarchitecturesanddevicetechnologiesofPLD's. - ComprehendFPGAArchitectures. - AnalyzeSystemlevelDesignandtheirapplicationforCombinationalandSequential Circuits. - FamiliarizewithAnti-FuseProgrammedFPGAs. - Applyknowledgeofthissubjectforvariousdesignapplications.					
UNIT-I		LectureHrs:			
Introduction to Programmable Logic Devices: Introduction, Simple Programmable Logic Devices – Read Only Memories, Programmable Logic Arrays, Programmable Array Logic, Programmable LogicDevices/GenericArrayLogic;ComplexProgrammableLogicDevices–ArchitectureofXilinx CoolRunnerXCR3064XLCPLD,CPLDImplementationofaParallelAdderwithAccumulation.					
UNIT-II	FieldProgrammableGateArrays	LectureHrs:			
FieldProgrammableGateArrays:OrganizationofFPGAs,FPGAProgrammingTechnologies, ProgrammableLogicBlockArchitectures,ProgrammableInterconnects,andProgrammableI/O blocksinFPGAs,DedicatedSpecializedComponentsofFPGAs,andApplicationsof FPGAs.					
UNIT-III		LectureHrs:			
SRAMProgrammableFPGAs:Introduction,ProgrammingTechnology,DeviceArchitecture,the XilinxXC2000,XC3000andXC4000 Architectures.					
UNIT-IV		LectureHrs:			
Anti-FuseProgrammedFPGAs:Introduction,ProgrammingTechnology,DeviceArchitecture, TheActelACT1,ACT2andACT3 Architectures.					
UNIT-V		LectureHrs:			
DesignApplications:GeneralDesignIssues,CounterExamples,AFastVideoController,APositionTracker foraRobotManipulator,AFastDMAController,DesigningCounterswithACT devices,DesigningAddersandAccumulatorswiththeACT Architecture					
Textbooks:					
- FieldProgrammableGateArrayTechnology-StephenM.Trimberger,SpringerInternational Edition. - DigitalSystemsDesign-CharlesH.RothJr,LizyKurianJohn,Cengage Learning.					
ReferenceBooks:					
- FieldProgrammableGateArrays-JohnV.Oldfield,RichardC.Dorf,WileyIndia. - Digital Design Using Field Programmable Gate Arrays - Pak K. Chan/SamihaMourad, Pearson Low Price Edition. - DigitalSystemsDesignwithFPGAsandCPLDs-IanGrout,Elsevier,Newnes. - FPGAbasedSystemDesign-WayneWolf,PrenticeHallModernSemiconductorDesignSeries.					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	LOWPOWERVLSIDESIGN ProgramElective-II	L	T	P	C
		3	0	0	3
Semester		I			
CourseObjectives:					
• Tounderstandtheconceptsofvelocitysaturation,ImpactIonizationandHotElectronEffect • ToimplementLowpowerdesignapproachesforsystemlevelandcircuitlevelmeasures. • Todesignlowpoweradders,multipliersandmemoriesforefficientdesignofsystems.					
CourseOutcomes(CO):Studentwillbeable to					
• Understandtheconceptsofvelocitysaturation,ImpactIonizationandHotElectronEffect • ImplementLowpowerdesignapproachesforsystemlevelandcircuitlevel measures. • Designlowpoweradders,multipliersandmemoriesforefficientdesignofsystems.					
UNIT-I	LectureHrs:				
Fundamentals: Need for Low Power Circuit Design, Sources of Power Dissipation – Static and Dynamic Power Dissipation, Short Circuit Power Dissipation, Glitching Power Dissipation, Short ChannelEffects–DrainInducedBarrierLoweringandPunchThrough,SurfaceScattering, Velocity Saturation,ImpactIonization,HotElectronEffect.					
UNIT-II	LectureHrs:				
Low-Power Design Approaches: Low-Power DesignthroughVoltage Scaling –VTCMOScircuits, MTCMOS circuits, Architectural Level Approach –Pipelining and Parallel Processing Approaches. SwitchedCapacitanceMinimizationApproaches:SystemLevelMeasures,CircuitLevelMeasures, MasklevelMeasures.					
UNIT-III	LectureHrs:				
Low-Voltage Low-Power Adders: Introduction, Standard Adder Cells, CMOS Adder's Architectures – Ripple Carry Adders, Carry Look Ahead Adders, Carry Select Adders, Carry Save Adders,Low-VoltageLow-PowerDesignTechniques–TrendsofTechnologyandPowerSupply Voltage,Low-VoltageLow-PowerLogicStyles.					
UNIT-IV	LectureHrs:				
Low-Voltage Low-Power Multipliers: Introduction, Overview of Multiplication, Types of Multiplier Architectures, BraunMultiplier, Baugh WooleyMultiplier, BoothMultiplier, Introduction to Wallace Tree Multiplier.					
UNIT-V	LectureHrs:				
Low-VoltageLow-PowerMemories: Basics of ROM,Low-Power ROMTechnology,FutureTrend and Development of ROMs, Basics of SRAM, Memory Cell, Precharge and Equalization Circuit, Low-PowerSRAMTechnologies,BasicsofDRAM,Self-RefreshCircuit,FutureTrendand DevelopmentofDRAM.					
Textbooks:					
1. CMOSDigitalIntegratedCircuits–AnalysisandDesign–Sung-MoKang,YusufLeblebici, TMH, 2011. 2. Low-Voltage, Low-Power VLSI Subsystems – Kiat-Seng Yeo, Kaushik Roy, TMH Professional Engineering.					
ReferenceBooks:					
1. IntroductiontoVLSI Systems:ALogic,CircuitandSystemPerspective–Ming-BOLin,CRC Press, 2011. 2. LowPowerCMOSDesign–AnanthaChandrakasan,IEEEPress/WileyInternational,1998. 3. Low Power CMOS VLSI Circuit Design– Kaushik Roy, Sharat C. Prasad, John Wiley & Sons.2000.					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	SCRIPTINGLANGUAGESFORVLSI ProgramElective-II	L	T	P	C
		3	0	0	3
Semester		I			
CourseObjectives:					
- Learnprogrammingwithscriptinglanguages - UnderstandhowtcreateandrunscriptusingPERL/TCL/PYTHONinCADTools - GainknowledgeaboutPERL/PYTHON/TCLindevelopingsystemandweb applications - DevelopskilltodesignarealtimprojectusingPERL/PYTHON					
CourseOutcomes(CO):Studentwillbeable to					
- Gainfluencyinprogrammingwithscriptinglanguages - CreateandrunscriptusingPERL/TCL/PYTHONinCADTools - DemonstratetheuseofPERL/PYTHON/TCLindevelopingsystemandweb applications - DeveloparealtimprojectusingPERL/PYTHON					
UNIT-I	Lecture Hrs:				
IntroductiontoScriptsandScripting:BasicsofLinux,OriginofScripting languages,scripting today, Characteristics and uses of scripting languages.					
UNIT-II	LectureHrs:				
PERL: Introduction to PERL, Names and values, Variables and assignment, Scalar expressions, Control structures, Built-in functions, Collections of Data, Working with arrays, Lists and hashes, Simpleinputandoutput,Strings,Patternsandregularexpressions,Subroutines,Scriptswith arguments.					
UNIT-III	LectureHrs:				
AdvancedPERL:FinerpointsofLooping,Subroutines,UsingPackandUnpack,workingwith files,Typeglobs,Eval,References,Datastructures,Packages,Librariesandmodules,Objectsand modulesinaction,tiedvariables,interfacingtotheoperatingsystems,Securityissues.					
UNIT-IV	LectureHrs:				
TCL:TheTCLphenomena,Philosophy,Structure,Syntax,Parser,VariablesanddatainTCL, Controlflow,Data structures,Simple input/output,Procedures,WorkingwithStrings, Patterns, Files andPipes,Examplecode.					
UNIT-V	LectureHrs:				
Advanced TCL: The eval, source, exec and up-level commands, Libraries and packages, Namespaces,Trappingerrors,Event-drivenprograms,Makingapplications'Internet-aware','Nuts- and-bolts' internet programming, Security issues, TCL and TK integration.					
PYTHON:IntroductiontoPYTHONlanguage,PYTHON-syntax,statements,functions,Built-in functions and Methods, Modules in PYTHON, Exception Handling.					
Textbooks:					
- TheWorldofScriptingLanguages-DavidBarron,WileyStudentEdition. - PYTHON Web Programming, Steve Holden and David Beazley, New Riders Publications					
ReferenceBooks:					
- TCL/TK:ADeveloper'sGuide-ClifFlynt,MorganKaufmannSeries. - CorePYTHONProgramming,Chun,PearsonEducation. - LearningPerl,RandalL.Schwartz,O'Reillypublications6thedition. - Linux: The Complete Referencel, Richard Peterson McGraw Hill Publications, 6th Edition.					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	NETWORKSECURITYANDCRYPTOGRAPHY	L	T	P	C
	ProgramElective-II	3	0	0	3
Semester		I			
CourseObjectives:					
- To identify and utilize different forms of cryptography techniques. - To incorporate authentication and security in the network applications. - To distinguish among different types of threats to the system and handle the same.					
CourseOutcomes(CO):					
- Identify and utilize different forms of cryptography techniques. - Incorporate authentication and security in the network applications. - Distinguish among different types of threats to the system and handle the same.					
UNIT-I		LectureHrs:			
Security: Need, security services, Attacks, OSI Security Architecture, one-time passwords, Model for Network security, Classical Encryption Techniques like substitution ciphers, Transposition ciphers, Cryptanalysis of Classical Encryption Techniques.					
UNIT-II		LectureHrs:			
Number Theory: Introduction, Fermat's and Euler's Theorem, The Chinese Remainder Theorem, Euclidean Algorithm, Extended Euclidean Algorithm, and Modular Arithmetic.					
UNIT-III		LectureHrs:			
Private-Key(Symmetric)Cryptography: Block Ciphers, Stream Ciphers, RC4 Stream cipher, Data Encryption Standard (DES), Advanced Encryption Standard (AES), Triple DES, RC5, IDEA, Linear and Differential Cryptanalysis.					
UNIT-IV		LectureHrs:			
Public-Key(Asymmetric)Cryptography: RSA, Key Distribution and Management, Diffie-Hellman Key Exchange, Elliptic Curve Cryptography, Message Authentication Code, hash functions, message digest algorithms: MD4 MD5, Secure Hash algorithm, RIPEMD-160, HMAC.					
UNIT-V		LectureHrs:			
Authentication and System Security: IP and Web Security Digital Signatures, Digital Signature Standards, Authentication Protocols, Kerberos, IP security Architecture, Encapsulating Security Payload, Key Management, Web Security Considerations, Secure Socket Layer, Secure Electronic Transaction Intruders, Intrusion Detection, Password Management, Worms, viruses, Trojans, Virus Countermeasures, Firewalls, Trusted Systems.					
Textbooks:					
1. William Stallings, —Cryptography and Network Security, Principles and Practices, Pearson Education, 3rd Edition.					
2. Charlie Kaufman, Radia Perlman and Mike Speciner, —Network Security, Private Communication in a Public World, 2 ND Edition.					
ReferenceBooks:					
1. Christopher M. King, Ertem Osmanoglu, Curtis Dalton, —Security Architecture, Design Deployment and Operations, RSA Pres,					



Dr. K. V. Subba Reddy Institute of Technology **(Autonomous)**

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

2. StephenNorthcutt,LenyZeltser,ScottWinters,KarenKent,andRonaldW.Ritchey,—Inside Network Perimeter Securityl, Pearson Education, 2nd Edition
3. RichardBejtlich,—ThePracticeofNetworkSecurityMonitoring: UnderstandingIncident DetectionandResponssl,WilliamPollockPublisher, 2013.



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	CMOSDIGITALICDESIGNLAB	L	T	P	C
		0	0	4	2
Semester		I			
CourseObjectives:					
- ToexplaintheVLSIDesignMethodologiesusinganyVLSIdesign tool. - TograspthesignificanceofvariousdesignlogicCircuitsinfull-customICDesign. - ToexplainthePhysicalVerificationinLayout Extraction. - TofullyappreciatethedesignandanalyzeofCMOSDigitalCircuits. - TograsptheSignificanceofPre-LayoutSimulationandPost-Layout Simulation.					
CourseOutcomes(CO):					
- ExplaintheVLSIDesignMethodologiesusinganyVLSIdesign tool. - GraspthesignificanceofvariousdesignlogicCircuitsinfull-customIC Design. - ExplainthePhysicalVerificationinLayout Extraction. - FullyappreciatethedesignandanalyzeofCMOSDigitalCircuits. - GrasptheSignificanceofPre-LayoutSimulationandPost-LayoutSimulation.					
ListofExperiments: Any 12 experiments need to be done					
The students are required to design and implement the Circuit and Layout using CMOS Technology.					
- Inverter Characteristics. - NAND and NOR Gate - XOR and XNOR Gate 2:1 Multiplexer - Full Adder - RS-Latch - Clock Divider - JK-Flip Flop - Synchronous Counter - Asynchronous Counter - Static RAM Cell - Dynamic Logic Circuits - Linear Feedback Shift Register					
Lab Requirements:					
Software:					
Mentor Graphics Tool / Cadence / Synopsys / Industry Equivalent Standard Software					
Hardware:					
Personal Computer with necessary peripherals, configuration and operating System.					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	MICROCONTROLLERSANDPROGRAMMABLE DIGITAL SIGNAL PROCESSORS LAB	L	T	P	C
		0	0	4	2
Semester		I			
CourseObjectives:					
• To writetheARM_C‘programmingforapplications • To understandtheinterfacingofvariousmoduleswithARM7/ARMCortex-M3 • To developassemblyandCProgrammingforDSPprocessors					
CourseOutcomes(CO):					
• Install,configureandutilizetoolsetsfordevelopingapplicationsbasedonARMprocessor core. • DesignanddeveloptheARM7basedembeddedsystemsforvarious applications. • DevelopapplicationprogramsonARMandDSPdevelopmentboardsbothinassemblyand C. • DesignandImplementthedigitalfiltersonDSP6713processor. • Analyzethehardwareandsoftwareinteractionandintegration.					
ListofExperiments: Any 12experimentsneedtobedone,Minimum02fromPartB					
PartA) ExperimentstobecarriedoutonCortex-MxdevelopmentboardsandusingGNUtool- chain					
1. BlinkanLEDwithsoftwaredelay,delaygeneratedusingtheSysTicktimer.					
2. SystemclockrealtimealterationusingthePLLmodules.					
3. ControlintensityofanLEDusingPWMimplementedinsoftwareandhardware.					
4. ControlanLEDusingswitchbypollingmethod,byinterruptmethodandflashtheLEDonce every five switch presses.					
5. UARTEchoTest.					
6. TakeanalogreadingsonrotationofrotarypotentiometerconnectedtoanADCchannel.					
7. TemperatureindicationonanRGB LED.					
8. MimiclightintensitysensedbythelightsensorbyvaryingtheblinkingrateofanLED.					
9. Evaluatethevarioussleepmodesbyputtingcoreinsleepanddeepsleepmodes.					
10. Systemresetusingwatchdogtimerincasesomethinggoes wrong.					
11. Samplesoundusingamicrophoneanddisplaysoundlevelson LEDs.					
PartB) ExperimentstobecarriedoutonDSPC6713evaluationkitsandusingCodeComposer Studio (CCS)					
12. TodevelopanassemblycodeandCcodetocomputeEuclidiandistancebetweenanytwo points					
13. Todevelopassemblycodeandstudytheimpactofparallel,serialandmixed execution					
14. TodevelopassemblyandCcodeforimplementationofconvolution operation					
15. TodesignandimplementfiltersinCtoenhancethefeaturesofgiveninputsequence/signa					
SoftwareRequirements:					
KeilforARM,CodeComposer Studio					
HardwareRequirements:					
ARMCortexMxDevelopmentBoards,TITMSC6713evaluationkit					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	RESEARCH METHODOLOGY AND INTELLECTUALPROPERTYRIGHTS	L	T	P	C
		2	0	0	2
	Semester	I			

CourseObjectives:

1. To understand the research design process and data collection methods.
2. To develop skills in data analysis and reporting.
3. To familiarize students with intellectual property rights (IPR) and patents.
4. To apply research skills in real-world contexts.

CourseOutcomes (CO):

- CO1-Recall key concepts and terminology related to research design, data collection, and intellectual property rights.
- CO2 -Explain the importance of research design and data analysis in research studies, and describe the concept of intellectual property rights.
- CO3 -Design a research study, including data collection and analysis methods, and apply intellectual property rights principles to protect research findings.
- CO4 -Analyze research studies to identify strengths and limitations, and evaluate the effectiveness of data collection and analysis methods.
- CO5-Assess the impact of intellectual property rights on research and innovation, and evaluate the effectiveness of research designs and methods.
- CO6 -Develop a comprehensive research plan, including a detailed research design, data collection and analysis methods, and a plan for protecting intellectual property.

*B.T-Blooms Taxonomy

CO	B.T	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L1	3	2	-	-	-	-	-	-	1	-	-	-
CO2	L2	3	3	-	2	2	-	1	-	2	-	-	1
CO3	L3	3	3	1	2	3	2	-	2	3	2	3	2
CO4	L4	2	3	1	2	2	2	-	-	3	2	2	3
CO5	L5	2	3	1	1	3	2	-	3	2	2	2	3
CO6	L6	3	3	2	3	3	3	-	3	3	3	3	3



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

UNIT-I	FUNDAMENTALS OF RESEARCH METHODOLOGY Overview of research process and design - Types of Research - Approaches to Research (Qualitative vs Quantitative) - Observation studies, Experiments and Surveys - Use of Secondary and exploratory data to answer the research question - Importance of Reasoning in Research and Research ethics - Documentation Styles (APA/IEEE etc.) - Plagiarism and its consequences Learning Outcomes - Recall key concepts of the research process, including different types and approaches to research, and the importance of ethics. - Differentiate between qualitative and quantitative research approaches and the various uses of secondary data. - Identify the core principles of research design and ethics, including plagiarism and documentation styles. - Explain the significance of reasoning and ethical conduct in all stages of the research process. - Apply knowledge of different documentation styles, such as APA and IEEE, to properly cite sources and avoid plagiarism.
UNIT-II	DATA COLLECTION AND SOURCES Importance of Data Collection - Types of Data - Data Collection Methods - Data Sources - primary, secondary and Big Data sources - Data Quality & Ethics - Tools and Technology for Data Collection Learning Outcomes - Identify different types of data and the various methods for collecting both primary and secondary data. - Explain the importance of data quality and ethical considerations in data collection. - Differentiate between primary, secondary, and Big Data sources. - Describe the various tools and technologies used for effective data collection. - Analyze the ethical implications of data collection and ensure data quality in a research study.
UNIT-III	DATA ANALYSIS AND REPORTING Overview of Multivariate analysis - Experimental research, cause-effect relationship, and development of hypotheses - Measurements systems analysis, error propagation, and validity of experiments - Guidelines for writing abstracts, introductions, methodologies, results, and discussions - Writing Research Papers & proposals Learning Outcomes - Apply knowledge of multivariate analysis and experimental research to develop hypotheses and analyze data. - Explain the process of measurements systems analysis and error propagation in experimental design. - Formulate clear and concise abstracts, introductions, and methodologies for research papers. - Write effective results and discussion sections based on data analysis. - Develop comprehensive research papers and proposals based on proper data analysis and reporting guidelines.
UNIT-IV	UNDERSTANDING INTELLECTUAL PROPERTY RIGHTS Intellectual Property - The concept of IPR, Evolution and development of concept of IPR, IPR development process, Trade secrets, utility Models, IPR & Bio diversity, Role of WIPO and WTO in IPR establishments, Right of Property, Common rules of IPR practices, Types and Features of IPR Agreement, Trademark, Functions of UNESCO in IPR maintenance. Learning Outcomes - Recall the fundamental concepts of Intellectual Property (IP) and its evolution. - Describe the roles of organizations like WIPO and WTO in the establishment of IPR. - Differentiate between various types of IPR, including trade secrets and trademarks. - Explain the common rules and features of IPR agreements and the role of UNESCO. - Analyze the relationship between IPR and biodiversity, and its broader impact.



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

UNIT-V	PATENTS
Patents – objectives and benefits of patent, Concept, features of patent, Inventive step, Specification - Types of patent application, process E-filing, Examination of patent, Grant of patent, Revocation, Equitable Assignments, Licenses, Licensing of related patents, patent agents, Registration of patent agents Learning Outcomes • Explain the objectives, benefits, and key features of a patent, including the concept of an inventive step. • Differentiate between the various types of patent applications and the e-filing process. • Describe the process of patent examination, grant, and revocation. • Identify the roles of patent agents and the process for their registration. • Analyze the concepts of equitable assignments, licenses, and licensing of related patents.	
Textbooks: 1. Stuart Melville and Wayne Goddard, <i>Research Methodology: An introduction for Science & Engineering students</i>, Juta and Company Ltd, 2004 2. Catherine J. Holland, <i>Intellectual property: Patents, Trademarks, Copyrights, Trade Secrets</i>, Entrepreneur Press, 2007.	
1. Cooper Donald R, Schindler Pamela S and Sharma J K, — <i>Business Research Methods</i>, Tata McGraw Hill Education 11e (2012). 2. Ranjit Kumar, <i>Research Methodology: A Step-by-Step Guide for Beginners</i>, David Hunt, Long Nguyen, Matthew Rodgers, — <i>Patent searching: tools & techniques</i>, Wiley, 2007. 3. Deborah E. Bouchoux, <i>Intellectual Property: The Law of Trademarks, Copyrights, Patents, and Trade Secrets</i>, 6th Edition, Cengage 2024. 4. Wayne C. Booth, Gregory G. Colomb, Joseph M. Williams, <i>The Craft of Research</i>, 5th Edition, University of Chicago Press, 2024 5. The Institute of Company Secretaries of India, Statutory body under an Act of parliament, — <i>Professional Programme Intellectual Property Rights, Law and practice</i>, September 2013. 6. Peter Elbow, <i>Writing With Power</i>, Oxford University Press, 1998.	
Online Resources (Free & Authentic) • Coursera/edX—Research Methodology and Data Analysis courses • SpringerLink & ScienceDirect—Latest journals on research design and statistics • Google Scholar—Free access to research papers • NCBI Bookshelf—Open-access research methodology resources • Khan Academy (Statistics & Probability)—For fundamental soft hypothesis testing, regression, and ANOVA.	



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	RTLSYNTHESIS,SIMULATIONAND VERIFICATION	L	T	P	C
		0	1	2	2
Semester		I			
Courseobjectives: Thiscourseaimsto					
• Thesimulationofcombinationalandsequentialcircuits. • FSMbaseddesigns. • ImplementationofDFTandFFTs. • Verifylayoutofbasicdigitalcircuits.					
Courseoutcomes: Aftercompletionofthiscourse,studentswillbeableto					
• Demonstratetheprocessstepsrequiredforsimulation/synthesis. • DesignandsimulatevariouscombinationalandsequentialcircuitsusingHDL. • DevelopanRTLcodeforvariousrealtimeapplications. • Synthesize/SimulateanRTLcodeforseveraldigitaldesigns • Buildandverifyvariousdigitalcircuits.					
Module1–IntroductiontoRTLDesign					
• RTLdesignflow:Specification→RTLCoding→Synthesis→Simulation→Verification. • HDLcodingstylesforsynthesis(SystemVerilog/VHDLbasics). • Lab: 1. WritesynthesizableVerilog/SystemVerilogcodefor: a) HalfAdder,FullAdder b) 4-bitRippleCarryAdder c) 4-bitSynchronousCounter(Up/Down) 2. FSMDesign:SequenceDetector(e.g.,detect—1011)).					
Module2–RTL Synthesis					
• Synthesisconcepts:mappingRTLtogate-levelnetlist. • Constraints:clock,area,power. • Lab: 1. Synthesizecombinationalandsequentialcircuits(Adder,Counter,FSM)using EDA tool 2. Generategate-levelnetlistandanalyzearea,delay,power reports. 3. Applyconstraints(clock,timing)andobserveimpactonsynthesisresults.					
Module3– Simulation					
• Functionalvs.Timingsimulation. • Testbenchcreation,waveforms,debugging. • Lab:Runsimulations 1. Developtestbenchesfor: a) 4-bitALU(add,sub,AND,OR). b) UniversalShiftRegister. 2. PerformfunctionalsimulationusingEDAtools 3. Performpost-synthesis(timing)simulationandcompareresultswith functional simulation.					
Module4– Verification					
• Verificationbasics:functionalverification,assertion-basedverification. • IntroductiontoUVM/OVMconcepts.					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

- Lab: Writing simple verification testbenches.
 1. Write self-checking testbenches for combinational and sequential circuits.
 2. Use assertion-based verification (System Verilog Assertions–SVA) for protocol checks (e.g., handshaking signals).
 3. Coverage-driven verification experiment: Create random testcases for FIFO/Memory.

Module 5–Case Study & Mini Project

- Design, synthesize, and verify a digital subsystem (e.g., ALU, UART, FIFO).
- End-to-end RTL→Synthesis→Simulation→Verification flow.
- Lab: Design, synthesize, simulate, and verify a **digital subsystem** such as:
 1. UART Transmitter/Receiver
 2. Simple CPU Core Module (Instruction Decoder+ALU+Register File)
 3. FIFO Buffer with full/empty flags

Textbooks/References

1. Samir Palnitkar – *Verilog HDL: A Guide to Digital Design and Synthesis*.
2. Michael Ciletti – *Advanced Digital Design with the Verilog HDL*.
3. Chris Spear & Greg Tumbush – *System Verilog for Verification*.
4. David Rich – *Design and Verification with System Verilog*.

Suggested reading:

1. Samir Palnitkar, — *Verilog HDL, a guide to digital design and synthesis*, Prentice Hall 2003.
2. Doug Amos, Austin Lesea, Rene Richter, — *FPGA based prototyping methodology manual*, Xilinx, 2011.
3. Bob Zeidman, — *Designing with FPGAs & CPLDs*, CMP Books, 2002.



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	IOTANDRTOSFOREMBEDDED APPLICATIONS		L	T	P	C
			0	1	2	2
Semester			I			
CourseObjectives:Thiscourseaimsto						
- LearninterfacingofsensorsandactuatorswithIoT devices. - KnowhowtointegratesensordatawithcloudplatformsusingIoTprotocols. - UnderstandRTOSconceptsformultitaskingandtaskscheduling. - Gainknowledgeininter-processcommunicationtechniquesinRTOS. - GetacquaintedaboutIoTApplicationsusingembeddedsystemsandRTOS.						
CourseOutcomes(CO):Studentwillbeable to						
- DemonstrateinterfacingofsensorsandactuatorswithIoT devices. - AcquireandintegratesensordatawithcloudplatformsusingIoT protocols. - ApplyRTOSconceptsformultitaskingandtaskscheduling. - Implementinter-processcommunicationtechniquesinRTOS. - DesignanddevelopIoTApplicationsusingembeddedsystemsandRTOS.						
ListofExperiments:						
Module1:IoTHardware&Sensors						
Introduction to IoT and embedded devices, Raspberry Pi and BeagleBone Black: Architecture, GPIO, SPI, I2C interfaces, Basics of interfacing digital and analog sensors/actuators, Interfacing LEDs, Buzzer, Push Button, IR, and LDR sensors.						
Experiments:						
- SetupRaspberrypi,installIOSandnecessarysoftware,testbasicconnectivity. - InterfaceLEDandBuzzer;writePythonprogramtoblinkLEDperiodically. - InterfacePushButtonorIR/LDRsensor;programtocontrolLEDbasedon input.						
Module2:IoTDataCollection&CloudIntegration						
Reading environmental sensors (temperature, humidity), IoT communication protocols: MQTT, HTTP, REST APIs, Cloud integration using Thingspeak, MQTT brokers.						
Experiments:						
- InterfaceDHT11sensorwithRaspberrypi;displaytemperatureandhumidityreadings. - UploadsensordatatThingspeakcloudandretrievefor visualization. - PublishandsubscribesensordatausingMQTTonBeagleBone Black.						
Module3:Real-TimeOperatingSystems(RTOS)Fundamentals						
Differences between Traditional OS and RTOS, Hard vs. Soft real-time systems; timing constraints and task scheduling, and multitasking concepts, Scheduling algorithms.						
Experiments:						
- IntroductiontoVxWorksRTOS:kernel,taskassignment,andmultitaskingbasics. - TimerprogramminginVxWorks. - Create tasksandimplementRoundRobinscheduling.						



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

Module4:Inter-ProcessCommunication(IPC)inRTOS

Task synchronization and communication, Semaphores: Binary and Counting, Message queues and mailboxes, Mutexes and critical sections.

Experiments:

1. TaskcommunicationusingmessagequeuesinVxWorks.
2. Synchronizetasksusingsemaphores.
3. ImplementIPCusingmailboxesfordataexchangebetweentasks.

Module5:IoTApplicationDesign

DesigningintegratedIoTsolutionstcombiningsensors,actuators,cloud,andRTOStasks

Experiments(Chooseone):

1. Designaweathermonitoringsystemwithreal-timecloudupload.
2. Smarthomeautomation:Controllights/fansbasedonsensorinputs.
3. IoT-basedvendingmachineprototypeusingVxWorksand sensors.

SuggestedReading:

1. ArshdeepBahgaandVijayMadiseti,*InternetofThings:AHands-onApproach*, Universities Press, 2015.
2. JaneW.S.Liu,*Real-TimeSystems*,PearsonEducation,Asia,2018.
3. WindRiverSystemsInc.,*VxWorksProgrammersGuide*,2019.
4. C.M.KrishnaandG.Shin,*Real-TimeSystems*,McGraw-Hill, 2015.
5. PracticalPythonProgramming forIoT:Build advancedIoTprojects using Raspberry Pi, MQTT, RESTful APIs, WebSockets, and Python 3, 2020.



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

ENGLISHFORRESEARCHPAPERWRITING (AuditCourse-I)		L	T	P	C
		2	0	0	0
CourseObjectives:					
1. ToequipstudentswiththefundamentalsofacademicEnglishforresearchpaperwriting. 2. Todevelopstudents'advancedreadingskillsforanalyzingandevaluatingresearch articles. 3. Torefinestudents'grammarandlanguageskillsforclarityandprecisioninresearch writing. 4. Tomastertheskillsofrevising,editing,andproofreadingresearchpapers. 5. To familiarize students with the role of technology and AI in research writing, including digital literacy and ethical considerations.					
CourseOutcomes(CO): Studentwillbeable to					
CO1-Recallthekeylanguageaspectsandstructuralelementsofacademicwritinginresearch papers. CO2–Explaintheimportanceofclarity,precision,andobjectivityinresearchwriting. CO3–Applycriticalreadingstrategiesandadvancedgrammarskillstoanalyzeandwriteresearch papers. CO4–Analyze research articles and identify the strengths and limitations of different methodologies. CO4 – Evaluate research papers to check for plagiarism, structure, clarity, and language accuracy. CO5–Evaluatetheeffectivenessofdifferentlanguageandtechnologytoolsinresearchwriting, including AI-assisted tools and plagiarism detection software. 6.CO6–Developawell-structuredresearchpaperthateffectivelycommunicatescomplexideas.					
UNIT-I	Fundamentals of Academic English			LectureHrs:	
AcademicEnglish-MAP(Message-Audience-Purpose)-LanguageProficiencyforWriting-Key Language Aspects - Clarity and Precision - Objectivity - Formal Tone - Integrating References - Word order - Sentences and Paragraphs - Link Words for Cohesion - Avoiding Redundancy / Repetition-Breakinguplongsentences -StructuringParagraphs -ParaphrasingSkills –Framing Title and Sub-headings					
UNIT-II	ReadingSkillsfor Researchers			LectureHrs:	
Reading Academic Texts - Critical Reading Strategies - Skimming and Scanning - Primary Research Article vs. Review Article - Reading an Abstract - Analyzing Research Articles - Identifying Arguments - Classifying Methodologies - Evaluating Findings - Making Notes					
UNIT-III	GrammarRefinementforResearchWriting			LectureHrs:	
Advanced Punctuation Usage - Grammar for Clarity - Complex Sentence Structures - Active-Passive Voice - Subject-Verb Agreement - Proper Use of Modifiers - Avoiding Ambiguous Pronoun References - Verb Tense Consistency - Conditional Sentences					
UNIT-IV	MasteryinRefiningWrittenContent/EditingSkills			LectureHrs:	
Effective Revisions - Restructuring Paragraph - Editing vs Proofreading, Editing for Clarity and Coherence - Rectifying Sentence Structure Issues - Proofreading for Grammatical Precision – Spellings - Tips for Correspondence with Editors - Critical and Creative Phases of Writing					
UNIT-V	TechnologyandLanguagefor Research			LectureHrs:	
DigitalLiteracyandCriticalEvaluationofOnlineContent-TechnologyandRoleofAI inResearch Writing– Assistancein GeneratingCitations and References -Plagiarismand Ethical Considerations – Tools and Awareness – Fair Practices					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

Textbooks:

1. Bailey, S. *Academic Writing: A Handbook for International Students*. London and New York: Routledge, 2015.
2. Adrian Wallwork, *English for Writing Research Papers*, Springer New York Dordrecht Heidelberg London, 2011.

Reference Books:

1. Craswell, G. *Writing for Academic Success*, Sage Publications, 2004.
2. Peter Elbow, *Writing With Power, E-book*, Oxford University Press, 2007
3. Oshima, A. & Hogue, A. *Writing Academic English*, Addison-Wesley, New York, 2005
4. Swales, J. & C. Feak, *Academic Writing for Graduate Students: Essential Skills and Tasks*. Michigan University Press, 2012.
5. Goldbort R. *Writing for Science*, Yale University Press (available on Google Books), 2006
6. Day R. *How to Write and Publish a Scientific Paper*, Cambridge University Press, 2006

Online Learning Resources:

1. <https://nptel.ac.in/noc/courses/noc20/SEM1/noc20-ge04/>
2. https://onlinecourses.swayam2.ac.in/ntr24_ed15/preview
3. "Writing in the Sciences" – Stanford University (MOOC on Coursera)
[<https://www.coursera.org/learn/sciwrite>] (<https://www.coursera.org/learn/sciwrite>)
4. Academic Phrasebank – University of Manchester
[<http://www.phrasebank.manchester.ac.uk>] (<http://www.phrasebank.manchester.ac.uk>)
5. OWL (Online Writing Lab) – Purdue University,
[<https://owl.purdue.edu>] (<https://owl.purdue.edu>)
(Resources on APA/MLA formats, grammar, structure, paraphrasing)
6. Zotero or Mendeley (Reference Management Tools) – Useful for managing citations and sources.



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

DISASTERMANAGEMENT (AuditCourse-I)		L	T	P	C
		2	0	0	0
Semester		I			
CourseObjectives:					
1. Toenablethestudentstounderstandthefundamentalconceptsofdisasters,hazards,theirfactors, and significance with special reference to India. 2. Topreparethemtoclassifyandanalyzeddifferenttypesofnaturalandman-madedisasters,their causes, magnitude, and impacts. 3. Tofosterthemdevelopunderstandingofdisasterpreparedness,monitoringsystems,andtherole of government, community, and media. 4. Toequiptheminlearningriskassessmenttechniques,disasterriskreductionstrategies,andthe importance of global and national cooperation. 5. Tofostertheirabilitytothinkcriticallyandrespondtodisastersanddesigneffectivemitigation measures (structural and non-structural) with a focus on emerging trends and Indian disaster management programs.					
CourseOutcomes					
Onsuccessfulcompletion,studentswillbeable to:					
CO1-Defineanddistinguishbetweenhazardsanddisasters,andexplaintheirtypes,nature,and impacts.					
CO2 Identify and map disaster-prone areas in India and understand the epidemiological consequences of disasters.					
CO3Assesstheeconomic,social,andecologicalrepercussionsofmajornaturalandman-made disasters.					
CO4 Demonstrate knowledgeof disaster preparedness tools such as remote sensing, meteorologicaldata, risk evaluation, and community awareness.					
CO5Applyriskassessment methodsandproposeddisasterriskreductionstrategiesatlocal,national,and global levels.					
CO6:Formulateandevaluatestructuralandnon-structuraldisastermitigationstrategies,with emphasis on Indian programs and emerging trends.					
SYLLABUS					
UNIT –I		Introduction			
Disaster-Definition,FactorsandSignificance-DifferenceBetweenHazardandDisaster-Naturaland Man-made Disasters - Difference, Nature, Types and Magnitude - Disaster Prone Areas in India-Study of Seismic Zones - Areas Prone to Floods and Droughts, Landslides andAvalanches -AreasPronetoCyclonicandCoastalHazardswithSpecialReferencetoTsunami -Post- Disaster Diseases and Epidemics.					
UNIT-II		RepercussionsofDisastersand Hazards			
Economic Damage - Loss of Human and Animal Life - Destruction of Ecosystem - Natural Disasters - Earthquakes,Volcanism,Cyclones,Tsunamis,Floods,DroughtsandFamines,LandslidesandAvalanches, Man-madedisaster-NuclearReactorMeltdown-IndustrialAccidents-OilSlicksandSpills-Outbreaks of Disease and Epidemics War and Conflicts.					
UNIT-III		DisasterPreparednessandManagement			
Preparedness -Monitoringof Phenomena -Triggeringa Disasteror Hazard -Evaluation of Risk- ApplicationofRemoteSensing-DatafromMeteorologicalandOtherAgencies -MediaReports- Governmental and Community Preparedness					

26



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

UNIT-IV	Risk Assessment
Disaster Risk-Concept and Elements, Disaster Risk Reduction - Global and National Disaster Risk Situation-Techniques of Risk Assessment-Global Co-Operation in Risk Assessment and Warning- People's participation in Risk Assessment – Strategies for Survival	
UNIT-V	Disaster Mitigation
Meaning, Concept and Strategies of Disaster Mitigation-Emerging Trends in Mitigation-Structural Mitigation and Non- Structural Mitigation - Programs of Disaster Mitigation in India	
Text books	
1. Gupta, H.K. <i>Disaster Management</i>. Universities Press, 2003 2. Singh, R.B. <i>Natural Hazards and Disaster Management</i>. Rawat Publications, 2006.	
Reference Books	
1. Coppola, D.P. (2020). <i>Introduction to International Disaster Management</i> (4th ed.). Elsevier. 2. Shaw, R., & Izumi, T. (2022). <i>Science and Technology in Disaster Risk Reduction in Asia</i>. Springer. 3. Wisner, B., Gaillard, J. C., & Kelman, I. (2021). <i>Handbook of Hazards and Disaster Risk Reduction and Management</i> (2nd ed.). Routledge. 4. Saini, V. K. (2021). <i>Disaster Management in India: Policy, Issues and Perspectives</i>. Sage India. 5. Kelman, I. <i>Disaster by Choice: How Our Actions Turn Natural Hazards into Catastrophes</i>, Oxford University Press, 2022 6. Sahni, P. & Dhameja, A. <i>Disaster Mitigation: Experiences and Reflections</i>. Prentice Hall of India, 2004.	
Online Resources	
• National Disaster Management Authority (NDMA), India: https://ndma.gov.in—official guidelines, reports, and policy frameworks. • United Nations Office for Disaster Risk Reduction (UNDRR): https://www.undrr.org—Sendai Framework, global risk reduction strategies. • Global Disaster Alert and Coordination System (GDACS): https://www.gdacs.org—real-time disaster alerts. • World Health Organization (WHO)—https://www.who.int/emergencies—disaster-related health guidelines.	



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

	ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE (Audit Course-I)	L	T	P	C
		2	0	0	0

COURSE OBJECTIVES: The objective of this course is	
1	To facilitate the students with the concepts of Indian traditional knowledge and to make them understand the importance of roots of knowledge system.
2	To make them understand the need for protecting traditional knowledge and its significance in the global economy.
3	To make them understand the legal framework and policies related to traditional knowledge protection.
4	To enable them to understand the relationship between traditional knowledge and intellectual property rights.
5	To make them explore the applications of traditional knowledge in different sectors, such as engineering, medicine, agriculture, and biotechnology

Unit-I: Introduction to traditional knowledge - Definition, Nature and characteristics, scope and importance - Kinds of traditional knowledge - Physical and social contexts in which traditional knowledge develop - Historical impact of social change on traditional knowledge systems - Indigenous Knowledge (IK) – Characteristics - traditional knowledge vis-à-vis indigenous knowledge - Traditional knowledge Vs western knowledge, traditional knowledge vis-à-vis formal knowledge

Learning Outcomes:

At the end of the unit the student will be able to:

- Understand the concept of traditional knowledge.
- Contrast and compare characteristics, importance & kinds of traditional knowledge.
- Analyze physical and social context of traditional knowledge.
- Evaluate social change on traditional knowledge.

Unit-II: Protection of traditional knowledge - Need for protecting traditional knowledge - Significance of TK Protection - Value of TK in global economy - Role of Government to harness TK.

Learning Outcomes:

At the end of the unit the student will be able to:

- Know the need of protecting traditional knowledge.
- Apply significance of TK protection.
- Analyze the value of TK in global economy.
- Evaluate role of government

Unit-III: Legal framework and TK - A) The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 - Plant Varieties Protection and Farmer's Rights Act, 2001 (PPVFR Act) – B) The Biological Diversity Act 2002 and Rules 2004 - the protection of traditional knowledge bill, 2016 - Geographical Indicators Act 2003.

Learning Outcomes:

At the end of the unit the student will be able to:

- Understand legal framework of TK.
- Contrast and compare the ST and other traditional forest dwellers
- Analyze plant variety protections
- Understand the rights of farmers forest dwellers



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

Unit-IV: Traditional knowledge and Intellectual property - Systems of traditional knowledge protection - Legal concepts for the protection of traditional knowledge - Certain non-IPR mechanisms of traditional knowledge protection - Patents and traditional knowledge - Strategies to increase protection of traditional knowledge -Global legal FORA for increasing protection of Indian Traditional Knowledge.

Learning Outcomes:

At the end of the unit the student will be able to:

- Understand TK and IPR
- Apply systems of TK protection.
- Analyze legal concepts for the protection of TK.
- Evaluate strategies to increase the protection of TK.

Unit-V: Traditional knowledge in different sectors - Traditional knowledge and Engineering - Traditional medicine system - TK and Biotechnology - TK in Agriculture - Traditional societies depend on it for their food and healthcare needs - Importance of conservation and sustainable development of environment - Management of biodiversity, Food security of the country and protection of TK

Learning Outcomes:

At the end of the unit the student will be able to:

- Know TK in different sectors.
- Apply TK in Engineering.
- Analyze TK in various sectors.
- Evaluate food security and protection of TK in the country.

Prescribed Books:

1. Mahadevan, B., Bhat Vinayak Rajat, Nagendra Pavana R. N. *Introduction to Indian Knowledge System: Concepts and Applications*, PHI Learning Pvt. Ltd. Delhi, 2022.
2. Basanta Kumar Mohanta and Vipin Kumar Singh, *Traditional Knowledge System and Technology in India*, Pratibha Prakashan 2012.

Reference Books

1. Pride of India: A Glimpse into India's Scientific Heritage, Samskrita Bharati, New Delhi.
2. Kak, S. C. — On Astronomy in Ancient India, *Indian Journal of History of Science*, 22(3), 1987
3. Subbarayappa, B. V. and Sarma, K. V. *Indian Astronomy: A Source Book*, Nehru Centre, Mumbai, 1985.
4. Bag, A. K. *History of Technology in India*, Vol. I, Indian National Science Academy, New Delhi, 1997.
5. Acarya, P. K. *Indian Architecture*, Munshiram Manoharlal Publishers, New Delhi, 1996.
6. Banerjee, P. *Public Administration in Ancient India*, Macmillan, London, 1961.
7. Kapoor Kapil, Singh Avadhesh, *Indian Knowledge Systems Vol – I & II*, Indian Institute of Advanced Study, Shimla, H.P., 2022

COURSE OUTCOMES: At the end of the course, students will be able to	
CO1	Define and explain the concept of traditional knowledge, its nature, characteristics, and scope
CO2	Understand the need for protecting traditional knowledge and its significance in the global economy
CO3	Explain the legal framework and policies related to traditional knowledge protection
CO4	Apply traditional knowledge in different sectors, such as engineering, medicine, agriculture, and biotechnology
CO5	Analyze the importance of traditional knowledge in various contexts, including its historical impact and social change
CO6	Analyze the relationship between traditional knowledge and intellectual property rights, including patents and non-IPR mechanisms

E-Resources: 1. <https://www.youtube.com/watch?v=LZP1StpYEPm2> 2. <http://nptel.ac.in/courses/121106003/>



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	CMOSANALOGIC DESIGN	L	T	P	C
		3	0	0	3
Semester		II			
CourseObjectives:					
- Thiscoursefocusesontheory,analysisanddesignofanalogintegratedcircuitsinboth Bipolar and Metal-Oxide-Silicon (MOS) technologies. - Basicdesignconcepts,issuesandtradeoffsininvolvedinanalogICdesignare explored. - Intuitiveunderstandingandreal-lifeapplicationsareemphasizedthroughoutthecourse. - To learn about Design of CMOS Op Amps, Compensation of Op Amps, Design of Two- Stage Op Amps, Power Supply Rejection Ratio of Two-Stage Op Amps, Cascade Op Amps, Measurement Techniques of OP Amp. - To knowabout OpAmps,gainboostingandcompensation techniques.					
CourseOutcomes(CO): Studentwillbeable to					
- DesignMOSFETbasedanalogintegratedcircuits. - Analyzeanalogcircuitsatleasttothefirstorder. - Appreciatethetrade-offsininvolvedinanalogintegratedcircuit design. - Understandandappreciatetheimportanceofnoiseanddistortioninanalogcircuits. - AnalyzecomplexengineeringproblemscriticallyinthedomainofanalogICdesignfor conducting research. - Solveengineeringproblemsforfeasibleandoptimalsolutionsinthecorearea					
UNIT-I		LectureHrs:			
Basic MOS Device Physics: General Considerations, MOS I/V Characteristics, Second Order effects, MOS Device models and MOS Capacitor. Short Channel Effects and Device Models. Single Stage Amplifiers–BasicConcepts,CommonSourceStage,SourceFollower,CommonGateStage, CascodeStage.					
UNIT-II		LectureHrs:			
Differential Amplifiers: Single Ended and Differential Operation, Basic Differential Pair, Common Mode Response, Differential Pair with MOSloads, Gilbert Cell.Passive and Active Current Mirrors – BasicCurrentMirrors,CascodeCurrentMirrors,ActiveCurrentMirrors.CurrentSteeringCircuit					
UNIT-III		LectureHrs:			
FrequencyResponseofAmplifiers: GeneralConsiderations,CommonSourceStage,Source Followers,CommonGateStage,CascodeStage,DifferentialPair.Noise–TypesofNoise, Representation of Noise in circuits, Noise in single stage amplifiers, Noise in Differential Pairs.					
UNIT-IV		LectureHrs:			
Feedback Amplifiers: General Considerations, Feedback Topologies, Effect of Loading.Operational Amplifiers – General considerations, One Stage Op Amps, Two Stage Op Amps, Gain Boosting, Common – Mode Feedback, Input Range limitations, Slew Rate, Power Supply Rejection, Noise in Op Amps, Stability and Frequency Compensation.					
UNIT-V		LectureHrs:			
Operational Amplifiers: One Stage Op-Amp, Two Stage Op-Amp, Gain Boosting, Common Mode Feed-Back, Input Range Limitations, Slew Rate, PSRR. Compensation of Two Stage Op-Amp, Slewing in Two Stage Op-Amp, Compensation Techniques. Design Procedure for 2-Stage Op-Amp.					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

Textbooks:
1. B.Razavi,—DesignofAnalogCMOSIntegratedCircuitsI,2 nd Edition,McGrawHillEdition2016.
2. Paul. R. Gray& Robert G. Meyer, —Analysis and Design of Analog Integrated CircuitsI, Wiley, 5 th Edition, 2009.
ReferenceBooks:
1.T.C. Carusone, D.A. Johns & K. Martin, —Analog Integrated Circuit DesignI, 2 nd Edition, Wiley, 2012.
2. P.E.Allen&D.R.Holberg,—CMOSAnalogCircuitDesignI,3 rd Edition,OxfordUniversityPress, 2011.
3. R.JacobBaker,—CMOSCircuitDesign,Layout,andSimulationI,3 rd Edition,Wiley,2010.
4. AdelS.Sedra,KennethC.Smith,Arun,—MicroelectronicCircuitsI,6 th Edition,OxfordUniversity Press



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	EMBEDEDESYSTEMSDESIGN	L	T	P	C
		3	0	0	3
Semester		II			
CourseObjectives:					
• TodifferentiatebetweenaGeneralpurposeandanEmbedded System. • ToprovideknowledgeonthebuildingblocksofEmbeddedSystem. • TounderstandtherequirementofEmbeddedfirmwareanditsroleinAPI.					
CourseOutcomes(CO):Studentwillbeable to					
• Expected to differentiate the design requirements between General Purpose and Embedded Systems. • Expectedtoacquiretheknowledgeoffirmwaredesignprinciples. • ExpectedtounderstandtheroleofRealTimeOperatingSysteminEmbedded Design. • ToacquiretheknowledgeandexperienceoftasklevelCommunicationinanyEmbedded System.					
UNIT-I	LectureHrs:				
IntroductiontoEmbeddedSystems:DefinitionofEmbeddedSystem,EmbeddedSystemsVsGeneral Computing Systems, History of Embedded Systems, Classification, Major Application Areas, Purpose of Embedded Systems, CharacteristicsandQualityAttributesofEmbeddedSystems.					
UNIT-II	LectureHrs:				
Typical Embedded System: Core of the Embedded System: General Purpose and Domain Specific Processors,ASICs,PLDs,CommercialOff-The-ShelfComponents(COTS),Memory:ROM,RAM, Memory according to the type of Interface, Memory Shadowing, Memory selection for Embedded Systems, Sensors and Actuators, Communication Interface: Onboard and External Communication Interfaces.DDR,Flash,NVRAM					
UNIT-III	LectureHrs:				
EmbeddedFirmware:ResetCircuit,Brown-outProtectionCircuit,OscillatorUnit,RealTimeClock, WatchdogTimer,EmbeddedFirmwareDesignApproachesandDevelopment Languages.					
UNIT-IV	LectureHrs:				
RTOSBasedEmbeddedSystemDesign:OperatingSystemBasics,TypesofOperatingSystems, Tasks, Process and Threads, Multiprocessing and Multitasking, Task Scheduling.					
UNIT-V	LectureHrs:				
TaskCommunication:SharedMemory,MessagePassing,RemoteProcedureCallandSockets,Task Synchronization:TaskCommunication/SynchronizationIssues,TaskSynchronizationTechniques, Device Drivers, How to Choose an RTOS.					
Textbooks:					
1. IntroductiontoEmbeddedSystems-ShibuK.V,McGraw Hill.					
ReferenceBooks:					
1. EmbeddedSystems -RajKamal,TMH.					
2. EmbeddedSystemDesign-FrankVahid,TonyGivargis,JohnWiley.					
3. EmbeddedSystems–Lyla,Pearson,2013					
4. AnEmbeddedSoftwarePrimer-DavidE.Simon,PearsonEducation.					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	PATTERNRECOGNITIONANDMACHINELEARNING	L	T	P	C
	ProgramElective–III	3	0	0	3
Semester		II			
CourseObjectives:					
- To understand the mathematical formulation of patterns. - To study the various linear models. - To understand the basic classifiers. - To distinguish different models.					
CourseOutcomes(CO):					
Student will be able to - Learn the basics of pattern classes and functionality. - Construct the various linear models. - Understand the importance kernel methods. - Learn the Markov and Mixed models.					
UNIT-I	LectureHrs:				
Introduction to Pattern recognition: Mathematical Formulation and Basic Functional Equation, Reduction of Dimensionality, Experiments in Pattern Classification, Backward Procedure for Both Feature Ordering- and Pattern Classification, Suboptimal Sequential Pattern Recognition, Nonparametric Design of Sequential Pattern Classifiers, Analysis of Optimal Performance and a Multiclass Generalization					
UNIT-II	LectureHrs:				
Linear Models: Linear Basis Function Models -Maximum likelihood and least squares, Geometry of least squares, Sequential learning, Regularized least squares, Multiple outputs, The Bias-Variance Decomposition, Bayesian Linear Regression -Parameter distribution, Predictive, Equivalent, Bayesian Model Comparison, Probabilistic Generative Models-Continuous inputs, Maximum likelihood solution, Discrete features, Exponential family, Probabilistic Discriminative Models -Fixed basis functions, Logistic regression, Iterative reweighted least squares, Multiclass logistic regression, Probit regression, Canonical link functions					
UNIT-III	LectureHrs:				
Kernel Methods: Constructing Kernels, Radial Basis Function Networks -Nadaraya-Watson model, Gaussian Processes -Linear regression revisited, Gaussian processes for regression, Learning the hyper parameters, Automatic relevance determination, Gaussian processes for classification, Laplace approximation, Connection to neural networks, Sparse Kernel Machines- Maximum Margin Classifiers, Overlapping class distributions, Relation to logistic regression, Multiclass SVMs, SVMs for regression, Computational learning theory, Relevance Vector Machines-RVM for regression, Analysis of sparsity, RVM for classification					
UNIT-IV	LectureHrs:				
Graphical Models: Bayesian Networks, Example: Polynomial regression, Generative models, Discrete variables, Linear-Gaussian models, Conditional Independence- Three example graphs, Dseparation, Markov Random Fields -Conditional independence properties, Factorization properties, Illustration: Image de-noising, Relation to directed graphs, Inference in Graphical Models- Inference on a chain, Trees, Factor graphs, The sum-product algorithm, The max-sum algorithm, Exact inference in general graphs, Loopy belief propagation, Learning the graph structure.					
UNIT-V	LectureHrs:				
Mixture Models and EM algorithm: K-means Clustering- Images segmentation and compression, Mixtures of Gaussians-Maximum likelihood, EM for Gaussian mixtures, An Alternative View of EM					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

Gaussian mixtures revisited, Relation to K-means, Mixtures of Bernoulli distributions, EM for Bayesian linear regression, The EM Algorithm in General, Combining Models- Tree-based Models, Conditional Mixture Models- Mixtures of linear regression models, Mixtures of logistic models, Mixtures of experts.

Textbooks:

1. Sequential methods in Pattern Recognition and Machine Learning- K.S. Fu, Academic Press, volume no.52.
2. Pattern Recognition and Machine Learning- C. Bishop- Springer, 2006.

Reference Books:

1. Pattern Classification- Richard O. Duda, Peter E. Hart, David G. Stork, John Wiley & Sons, 2nd Ed., 2001.
2. The elements of Statistical Learning- Trevor Hastie, Robert Tibshirani, Jerome H. Friedman, Springer, 2nd Ed., 2009



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	PROGRAMMINGLANGUAGESFOREMBEDDED SOFTWARE ProgramElective-III	L	T	P	C
		3	0	0	3
Semester		II			
CourseObjectives:					
• TointroducestudentstovariousprogramminglanguageslikeC, C++,Javascript,PERL,etc. • TodistinguishbetweenProceduralandOOPlanguage,IntroducefeaturesofOOPsetc. • TodemonstratethedevelopmentofsometypicalapplicationsusingdifferentProgramming languages.					
CourseOutcomes(CO): Studentswillbeableto:					
• IntroducestudentstovariousprogramminglanguageslikeC,C++,Javascript,PERL,etc. • DistinguishbetweenProceduralandOOPlanguage,IntroducefeaturesofOOPsetc. • DemonstratethedevelopmentofsometypicalapplicationsusingdifferentProgramming languages.					
UNIT-I		LectureHrs:			
Embedded 'C' Programming: Bitwise operations, Dynamic memory allocation, OS services, linkedstackandqueue,Sparsematrices,Binarytree,InterrupthandlinginC,Codeoptimization issues, Writing LCD drives, LED drivers, Drivers for serial port communication, Embedded SoftwareDevelopmentCycleandMethods(Waterfall,Agile).					
UNIT-II		LectureHrs:			
ObjectOrientedProgramming: Introductiontoprocedural,modular,objectorientedandgeneric programmingtechniques, Limitationsof procedural programming, objects, classes, data members, methods, data encapsulation, data Abstractionandinformationhiding,inheritance,polymorphism.					
UNIT-III		LectureHrs:			
C++ Programming: _cin_, _cout_, formatting and I/O manipulators, new and delete operators, Definingaclass,datamembersandmethods,_this'pointer,constructors,destructors,friendfunction, dynamicmemoryallocation.					
UNIT-IV		LectureHrs:			
Overloading and Inheritance: Need of operator overloading, overloading the assignment, overloadingusingfriends,typeconversions,singleinheritance,baseandderivedclasses,friend classes, types of inheritance, hybrid inheritance, multipleinheritance. Templates:Functiontemplateandclasstemplate,memberfunctiontemplatesandtemplate arguments					
UNIT-V		LectureHrs:			
ExceptionHandling: Syntaxforexceptionhandlingcode:try-catch-throw,MultipleExceptions. ScriptingLanguages: OverviewofScriptingLanguages-PERL,CGI,VBScript,JavaScript. PERL:Operators,StatementsPatternMatchingetc.DataStructures,Modules,Objects,Tied Variables, Inter process Communication Threads, Compilation & Line Interfacing.					
Textbooks:					
1. MichaelJ.Pont,—Embedded C++, Pearson Education,2 nd Edition,2008 2. RobertSedgewick,—AlgorithmsinC++I,Addison WesleyPublishingCompany,1999.					
ReferenceBooks:					
1. RandallL.Schwartz,—LearningPerlII,O'ReillyPublications,6thEdition2011 2. MichaelBerman, —Datastructures via C++I, OxfordUniversityPress, 2002					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	RF IC DESIGN	L	T	P	C
	Program Elective–III	3	0	0	3
Semester		II			
Course Objectives:					
- To introduce students the concept of tuned circuit, matching network, reflection coefficients, transmission lines and MOS high frequency behavior etc. - To demonstrate design of High Frequency Amplifiers. - To introduce various types of Power Amplifiers and PLLs					
Course Outcomes (CO): Students will be able to					
- Introduce students the concept of tuned circuit, matching network, reflection coefficients, transmission lines and MOS high frequency behavior etc. - Demonstrate design of High Frequency Amplifiers. - Introduce various types of Power Amplifiers and PLLs					
UNIT-I	Lecture Hrs:				
RFTuned Circuits: RF systems–Basic architectures, Maximum Power Transfer, Passive RLC Networks, Parallel RLC tank, Q, Series RLC networks, matching, Pi match, T match, Passive components in IC: Resistors, capacitors, Inductors, Transceiver Architectures.					
UNIT-II	Lecture Hrs:				
Nonlinearity and Reflection Coefficient: Nonlinearity and Time Variance of system, sensitivity and dynamic range, Review of MOS Device Physics, MOS device review, Distributed Systems, Transmission lines, reflection coefficient, the wave equation Lossy transmission lines Smith charts – plotting gamma, Noise in FET: Thermal noise, flicker noise review					
UNIT-III	Lecture Hrs:				
High Frequency Amplifier Design: Bandwidth estimation using open-circuit time constants, Bandwidth estimation using short-circuit time constants, Rise-time, delay and bandwidth, Zero to enhance bandwidth, Shunt- series amplifiers, tuned amplifiers Cascaded amplifiers, Noise figure, Intrinsic MOS noise parameters, LNA Design, Power match versus noise match.					
UNIT-IV	Lecture Hrs:				
RFPower Amplifiers: Multiplier based mixers, Subsampling mixers & Mixer Design, RF Power Large signal performance Amplifiers, Class A, AB, B, C amplifiers, Class D, E, F amplifiers, RF Power amplifier design issues.					
UNIT-V	Lecture Hrs:				
PLL: Voltage controlled oscillators, Resonators, Negative resistance oscillators, Phase locked loops, Linearized PLL models, Phase detectors, charge pumps, Loop filters, PLL design examples, Frequency synthesis and oscillator Frequency division, integer-N synthesis, Fractional frequency synthesis, Phase noise.					
Textbooks:					
1. Thomas H. Lee,—The Design of CMOS Radio-Frequency Integrated Circuits, Cambridge University Press, 2004.					
2. Behzad Razavi,—RF Microelectronics, Prentice Hall, 1997.					



Dr. K. V. Subba Reddy Institute of Technology **(Autonomous)**

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

ReferenceBooks:

1. Abidi,P.R.Gray,andR.G.Meyer,eds.,—IntegratedCircuitsforWirelessCommunications,New York: IEEE Press, 1999.
2. R.LudwigandP.Bretchko,—RFCircuitDesign,TheoryandApplications,Pearson,2000



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	SoC ARCHITECTURE Program Elective-IV	L	T	P	C
		3	0	0	3
Semester		II			
CourseObjectives:					
• To understand the basics related to SoC architecture and different approaches related to SoC Design. • To select an appropriate robust processor for SoC Design. • To select an appropriate memory for SoC Design. • To realize real time case studies					
CourseOutcomes(CO): Student will be able to					
• Understand the basics related to SoC architecture and different approaches related to SoC Design. • Select an appropriate robust processor for SoC Design • Select an appropriate memory for SoC Design. • Realize real time case studies					
UNIT-I		Lecture Hrs:			
Introduction to the System Approach: System Architecture, Components of the system, Hardware & Software, Processor Architectures, Memory & Addressing. System level interconnection, An approach for SOC Design, System Architecture and Complexity.					
UNIT-II		Lecture Hrs:			
Processors: Introduction, Processor Selection for SOC, Basic concepts in Processor Architecture, Basic concepts in Processor Microarchitecture, Basic elements in Instruction handling. Buffers: minimizing Pipeline Delays, Branches, More Robust Processors, Vector Processors and Vector Instruction extensions, VLIW Processors, Superscalar Processors					
UNIT-III		Lecture Hrs:			
Memory Design for SOC: Overview: SOC external memory, SOC Internal Memory, Size, Scratchpads and Cache memory, Cache Organization, Cache data, Write Policies, Strategies for line replacement at miss time, Other Types of Cache, Split- I, and D – Caches, Multilevel Caches, SOC Memory System, Models of Simple Processor-memory interaction.					
UNIT-IV		Lecture Hrs:			
Interconnect, Customization and Configurability: Interconnect Architectures, Bus: Basic Architectures, SOC Standard Buses, Analytic Bus Models, Using the Bus model, Effects of Bus transactions and contention time. SOC Customization: An overview, Customizing Instruction Processor, Reconfigurable Technologies, Mapping design onto Reconfigurable devices, Instance-Specific design, Customizable Soft Processor, Reconfiguration-overhead analysis and trade-off analysis on reconfigurable Parallelism.					
UNIT-V		Lecture Hrs:			
Application Studies/Case Studies: SOC Design approach; AES-algorithms, Design and evaluation; Image compression-JPEG compression.					
Textbooks:					
1. Computer System Design System-on-Chip - Michael J. Flynn and Wayne Luk, Wiley India Pvt.Ltd. 2. ARMSystem on Chip Architecture-Steve Furber, 2nd Edition, 2000, Addison Wesley Professional.					



Dr. K. V. Subba Reddy Institute of Technology **(Autonomous)**

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

ReferenceBooks:

1. Design of System on a Chip: Devices and Components – Ricardo Reis, 1st Ed., 2004, Springer
2. Co-Verification of Hardware and Software for ARM System on Chip Design (EmbeddedTechnology) – Jason Andrews – Newnes, BK and CDROM.
3. System on Chip Verification – Methodologies and Techniques –PrakashRashinkar, PeterPaterson and Leena Singh L, 2001, Kluwer Academic Publishers



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	SYSTEMDESIGNWITHEMBEDDEDLINUX ProgramElective-IV	L	T	P	C
		3	0	0	3
Semester		II			
CourseObjectives:					
- To understand the importance of Embedded Linux in system design - To analyze the architecture of embedded Linux in detail - To explain the Linux BSP for a hardware platform - To develop and debug the drivers in Embedded Linux					
CourseOutcomes(CO):					
Students will be able to - Understand the importance of Embedded Linux in system design - Analyze the architecture of embedded Linux in detail - Explain the Linux BSP for a hardware platform - Develop and debug the drivers in Embedded Linux					
UNIT-I	LectureHrs:				
Introduction: Need of Embedded Linux, Embedded Linux versus Desktop Linux, Embedded Linux Distributions Embedded Linux Architecture, Kernel Architecture: Hardware Abstraction Layer (HAL), Memory Manager, Scheduler, File System, IO Subsystem, Networking Subsystems, IPC; UserSpace, Linux Start-Up Sequence.					
UNIT-II	LectureHrs:				
Board Support Package: Inserting BSP in Kernel Build Procedure, the Boot Loader Interface, MemoryMap, Interrupt Management, the PCISubsystem, Timers, UART, and Power Management. Embedded Storage: Flash Map, Memory Technology Device, MTD Architecture, Embedded File Systems.					
UNIT-III	LectureHrs:				
Embedded Drivers: Linux Serial Driver, Ethernet Driver, and I2C Subsystem on Linux, USB Gadgets, Watchdog Timer, and Kernel Modules. Porting Applications: Architectural Comparison, Application Porting Roadmap.					
UNIT-IV	LectureHrs:				
Real-Time Linux: Linux and Real-Time: Building and Debugging: Building the Kernel, Building the Root File System, Integrated Development Environment, Elementary Concepts of Debugging. Embedded Graphics: Graphics System, Introduction to Display Hardware.					
UNIT-V	LectureHrs:				
uClinux: Linux on MMU-Less Systems, Program Load and Execution, Memory Management, File /Memory Mapping.					
Textbooks:					
1. Derek Molloy, —Exploring Beagle Bone: Tools and Techniques for Building with Embedded Linux I, Wiley, 1st Edition, 2014. 2. Christopher Hallinan, —Embedded Linux Primer: A Practical Real-World Approach I, Prentice Hall, 2nd Edition, 2010.					
ReferenceBooks:					
1. P. Raghavan, Amol Lad, Sriram Neelakandan, —Embedded Linux System Design and Development I, Auerbach Publications, 2005. 2. Karim Yaghmour, —Building Linux Systems I, O'Reilly & Associates, 2008.					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	PHYSICALDESIGNAUTOMATION ProgramElective-IV	L	T	P	C
		3	0	0	3
Semester		II			
CourseObjectives:					
• To understand relation between automational algorithms and constraints posed by VLSI technology. • To adopt algorithm to meet critical design parameters. • To design area efficient logics by employing different routing algorithms and shape functions. • To simulate and synthesis different combinational and sequential logics.					
CourseOutcomes(CO): Student will be able to					
• Understand relation between automational algorithms and constraints posed by VLSI technology. • Adopt algorithm to meet critical design parameters. • Design area efficient logics by employing different routing algorithms and shape functions. • Simulate and synthesis different combinational and sequential logics.					
UNIT-I		LectureHrs:			
VLSI Design Automation Tools: Algorithms and system design, Structural and logic design, Transistor level design, Layout design, Verification methods, Design management tools.					
UNIT-II		LectureHrs:			
Layout: Compaction, placement and routing, Design rules, symbolic layout, Application of compaction. Formulation methods, Algorithms for constrained graph compaction, Circuit representation, Wire length estimation, Placement algorithms, Partitioning algorithms.					
UNIT-III		LectureHrs:			
Floor planning and routing: Floor planning concepts, Shape functions and floor planning sizing, Local routing, Area routing, Channel routing, global routing and its algorithms.					
UNIT-IV		LectureHrs:			
Simulation and Logic Synthesis: Gate level and switch level modeling and simulation, Introduction to combinational logic synthesis, ROBDD principles, implementation, construction and manipulation, two level logic synthesis.					
UNIT-V		LectureHrs:			
High-Level Synthesis: Hardware model for high level synthesis, internal representation of input algorithms, Allocation, assignment and scheduling, scheduling algorithms, Aspects of assignment, High level transformations.					
Textbooks:					
1. S.H.Gerez, Algorithms for VLSI Design Automation, John Wiley, 1998.					
2. N.A.Sherwani, Algorithms for VLSI Physical Design Automation, (3/e), Kluwer, 1999.					
ReferenceBooks:					
1. S.M.Sait, H. Youssef, VLSI Physical Design Automation, World scientific, 1999.					
2. M.Sarrafzadeh, Introduction to VLSI Physical Design, McGraw Hill (IE), 1996					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	CMOSANALOGICDESIGNLAB	L	T	P	C
		0	0	4	2
Semester		II			
CourseObjectives:					
• ToexplaintheVLSIDesignMethodologiesusingVLSIdesign tool. • TograspthesignificanceofvariousCMOSanalogcircuitsinfull-customICDesignflow • ToexplainthePhysicalVerificationinLayoutDesign • Tofullyappreciatethedesignandanalyzeofanalogandmixedsignalsimulation • TograsptheSignificanceofPre-LayoutSimulationandPost-Layout Simulation					
CourseOutcomes(CO):					
• ExplaintheVLSIDesignMethodologiesusingVLSIdesign tool. • GraspthesignificanceofvariousCMOSanalogcircuitsinfull-customICDesignflow • ExplainthePhysicalVerificationinLayout Design • Fullyappreciatethedesignandanalyzeofanalogandmixedsignalsimulation • GrasptheSignificanceofPre-LayoutSimulationandPost-LayoutSimulation					
ListofExperiments:					
• ThestudentsarerequiredtoimplementLAYOUTSofanySIXExperimentsusingCMOS Technology and Compare the results with Pre-Layout Simulation. 1. MOSDeviceCharacterizationandparametricanalysis 2. CommonSourceAmplifier 3. CommonSourceAmplifierwithsourcedegeneration 4. Cascodeamplifier 5. Simplecurrentmirror 6. Cascodecurrentmirror. 7. Wilsoncurrentmirror. 8. DifferentialAmplifier 9. TwostageOperationalAmplifier 10. SampleandHoldCircuit 11. Direct-conversionADC 12. R-2RLadderTypeDAC					
LabRequirements:					
Software: MentorGraphicsTool/Cadence/Synopsys/IndustryEquivalentStandardSoftware					
Hardware: PersonalComputerwithnecessaryperipherals,configurationandoperatingSystem.					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	EMBEDDEDSYSTEMSDESIGN LAB	L	T	P	C
		0	0	4	2
Semester		II			
CourseObjectives: Thiscourseaimsto					
• Tofamiliarizewithembeddedsystemsprogrammingconcepts • Toimplementdifferentembeddedcommunicationandinterfacingprotocols					
CourseOutcomes(CO): Studentwillbeable to					
• Familiarizewithembeddedsystemsprogrammingconcepts • Implementdifferentembeddedcommunicationandinterfacingprotocols					
ListofExperiments:					
1. FunctionalTestingof Devices:FlashingtheOSontothedeviceintoastablefunctionalstateby porting desktop environment with necessary packages. 2. ExportingDisplayontootherSystems:Makinguseofavailablelaptop/desktopdisplaysasa display for the device using SSH client & X11 display server. 3. GPIOProgramming:ProgrammingofavailableGPIOpinsofthecorrespondingdeviceusing native programming language. Interfacing of I/O devices like LED/Switch etc., and testing the functionality. 4. InterfacingChronoseZ430:ChronosdeviceisaprogrammableTexasInstrumentswatch which can be used for multiple purposes like PPT control, Mouse operations etc., Exploit the features of the device by interfacing with devices. 5. ON/OFFControlBasedOnLightIntensity: Usingthelightsensors,monitorthesurrounding light intensity & automatically turn ON/OFF the high intensity LED's by taking some pre-defined threshold light intensity value. 6. Battery Voltage Range Indicator: Monitor the voltage level of the battery and indicating the sameusingmultipleLED's (forex:for3Vbatteryand3LEDs,turnon3LEDsfor2-3V,2LEDs for 1-2V, 1 LED for 0.1-1V & turn off all for 0V) 7. DiceGameSimulation: Insteadofusingtheconventionaldice,generatearandomvaluesimilar to dice value anddisplaythe same usinga 16X2 LCD.Apossibleextensioncouldbe to providethe user with option of selecting single or double dice game. 8. DisplayingRSSNewsFeedonDisplayInterface: DisplayingtheRSSnewsfeedheadlineson a LCD display connected to device. This can be adapted to other websites like twitter or other information websites. Python can be used to acquire data from the internet. 9. PortingOpenw.r.ttheDevice: Attempt tousethedevicewhileconnectingtoaWi-Finetwork using a USB dongle and at the same time providing a wireless access point to the dongle. 10. Hosting a website on Board: Building and hosting a simple website(static/dynamic) on the deviceandmakeitaccessibleonline.Thereisaneedtointallserver(eg:Apache)andtherebyhost the website. 11. WebcamServer: InterfacingtheregularUSBwebcamwiththedevicelandturnitintofully functional IP webcam & test the functionality. 12. FMTransmission:TransformingthedeviceintoaregularFMtransmittercapableof transmitting audio at desired frequency (generally 88-108 MHz)					
SoftwareRequirements: Keil/Python					
HardwareRequirements: Arduino/RaspberryPi/Beaglebone					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

	QUANTUMTECHNOLOGIESAND APPLICATIONS	L	T	P	C
		2	0	0	2

Course Objectives

1. Presentcorequantumprinciplessuchassuperpositionandentanglementwithoutmathematical formalism.
2. Developconceptual clarityon qubits,quantum states,andinformation frameworks.
3. Examinetheoreticalchallengesin realizingscalablequantum systems.
4. Introducefoundationalideasinquantumcommunicationandcomputing.
5. Highlightapplications,industrialadoption,andfutureresearchdirectionsinquantum technologies.

Course Outcomes

Uponcompletion,thelearnerwillbeableto:

Explainfundamentalquantumconceptsconceptually.

Distinguishclassicalinformationsystemsfromquantuminformationframeworks.

Identify the principal theoretical limitations in building quantum computers.

Describetheconceptualbasisofquantumcommunicationandcomputation.

Discusscurrentapplications,technologicaltrajectories,andcareeropportunitiesinthequantumdomain.

Unit1:Foundations ofQuantumTheoryand Technologies

Transition from classical to quantum physics. Key conceptual principles: Superposition, Entanglement, Uncertainty, Wave-particle duality. Quantum states and measurement; the role of the observer. Representative quantum systems: electrons, photons, atoms. Concept ofquantization and discrete energy levels. Strategic relevance of quantum technologies.

Overview of major domains: Computing, Communication, Sensing. Global quantum initiatives: India's National Quantum Mission, EU Quantum Flagship, USA, China.

Unit2:Conceptual StructureofQuantum Information

Qubits: qualitative understandingusingspin and polarization. Classical bits vs quantum bits: distinctions andimplications. Quantumsystems(non-engineeringperspective):trapped ions,superconductingqubits, photonics. Coherence and decoherence mechanisms. Abstract notions: quantum states, measurement operators, Hilbert space—interpretation without mathematics. Entanglement and non-locality as foundational resources. Quantum vs classical information principles; philosophical considerations.

Unit3:BuildingaQuantumComputer–Challengesand Requirements

Conceptual prerequisites for functional quantum hardware. Fragility of quantum states: decoherence, noise, stability issues. Requirements: isolation, error resilience, scalability, control. Why maintaining entanglement is difficult; theoretical necessity of quantum error correction. Comparative overview of hardware platforms (superconducting circuits, trapped ions, photonics).Current progress vs scientific constraints; conceptual view of quantum software's role.



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

Unit4:QuantumCommunication andComputing

(Redundant explanations removed, retaining only unique themes.)Quantum vs classical communication paradigms. Essentials of Quantum Key Distribution (QKD) and its security rationale. Entanglement-enabled communication protocols. Concept of the Quantum Internet and secure global networking. Introduction to quantum computing and quantum parallelism.

Conceptual comparison of classical and quantum gate operations. Challenges: decoherence, noise, and the necessity of error correction frameworks.

Unit5:Applications,Industry,andFuture Directions

Application domains: Healthcare and drug discovery, Material science and chemistry, Optimization and logistics, Quantum sensing and precision timing. Case studies: IBM, Google, Microsoft, PsiQuantum. Ethical, societal, and policy considerations. Barriers to adoption: cost, skilled workforce, standards. Emergingresearch andcareerlandscapes; India'sstrategicopportunityintheglobalquantumecosystem.

Textbooks

1. Nielsen&Chuang,QuantumComputationandQuantumInformation,CambridgeUniversityPress, 2010.
2. Rieffel&Polak,QuantumComputing:AGentleIntroduction,MITPress,2011.
3. ChrisBernhardt,QuantumComputingforEveryone,MITPress,2019.

ReferenceBooks

DavidMcMahon,QuantumComputingExplained,Wiley, 2008.
Kaye,Lafamme,Mosca,AnIntroductiontoQuantumComputing,OUP,2007. Scott
Aaronson, Quantum Computing Since Democritus, CUP, 2013.
Susskind&Friedman,QuantumMechanics:TheTheoreticalMinimum,BasicBooks,2014.
Rosenblum & Kuttner, Quantum Enigma, OUP, 2011.
Benentietal.,PrinciplesofQuantumComputationandInformation,WorldScientific,2004. DST
India and MeitY: Official Quantum Mission Reports, 2020 onwards.
QuantumFlagshipEU: Roadmapsand StrategyDocuments.

OnlineLearningResources

IBMQuantumExperience&QiskitTextbookCoursera–QuantumMechanicsandQuantum
Computation (UC Berkeley) edX – Quantum Internet & Quantum Computers
YouTube– Quantum Computingforthe Determined (Michael Nielsen)



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

		PEDAGOGYSTUDIES			
		L	T	P	C
		2	0	0	0
Semester		II			
CourseObjectives:					
1. Toenablethestudentstounderstandtheaims,rationale,policybackground,andconceptual frameworks in pedagogy, curriculum, and teacher education research.					
2. Todevelopanunderstandingofdiversepedagogical practices					
3. Tomakethemlearnthethodologiesforassessingtheeffectivenessofpedagogical practices and teacher education models.					
4. Toenablethemtolearnprofessionaldevelopmentstrategies,includingpeersupport, community engagement, and alignment with curriculum and assessment.					
CourseOutcomes(CO):Studentswillbeableto					
1. Defineandexplainkeyconcepts,frameworks,andmethodologiesinpedagogyandteacher education research.					
2. Criticallyanalyzepedagogicalpracticesusedindiverseclassroomsettings,withreference to teacher education and curriculum design.					
3. Evaluatetheeffectivenessofpedagogicalapproachesusingqualityassessmenttoolsand theory of change models.					
4. Applyevidence-basedstrategiestoimproveclassroompractices,curriculumalignment,and teacher professional development.					
5. Identifyandaddressbarrierstolearningthroughinnovativepedagogical strategies.					
6. Designandproposeresearchstudieshatcontributeofillinggapsinpedagogy,curriculum, and teacher education, with focus on dissemination and impact.					
UNIT-I		Foundationsof Pedagogy			
Introductiontopedagogyanditsimportanceineducation-Historicalandphilosophicalfoundationsof pedagogy -Theories oflearningandteaching(behaviorist, cognitive, constructivist) -Role of pedagogyin shapeducationalpractices -Roleoftechnologyinmodernpedagogy(ICT,e-learning,blendedlearning)					
UNIT-II		Teaching-LearningProcesses			
Understandingtheteaching-learningprocess-Lessonplanningandcurriculumdesign -Strategiesfor effectiveteachingandlearning(expository,collaborative,experiential) -Useoftechnologytoenhance teaching-learning processes (multimedia, simulations, gamification)					
UNIT-III		TechnologyIntegrationinEducation			
Educational technology and system design -Instructional design models (ADDIE, ASSURE, Dick and CareyModel) -Emergingtrendsine-learning(sociallearning,MOOCs,mobilelearning) -ICT toolsfor teaching and learning (Learning Management Systems, online resources)					
UNIT-IV		Pedagogyand Assessment			
Pedagogy, pedagogical analysis, and assessment -Types of assessment (placement, formative, diagnostic,summative)-Technology-basedassessmenttools(onlinequizzes,polls,discussions) -Rubricsforselfandpeerevaluation-Reflective Practices					
UNIT-V		ContemporaryIssuesandTrends			
Inclusiveeducationandtechnology(assistivetechnology,accessibility)-Changemanagementand innovationineducation-Qualityassuranceandevaluationineducation(TQM,SixSigma)-Futuretrends in pedagogyandtechnology(AI,AR,VRineducation)-Personalizedlearningandadaptiveteaching.					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

Textbooks

1. Alexander, R.J. *EssaysonPedagogy*. Routledge, 2008.
2. Shulman, L.S. *TheWisdomofPractice: EssaysonTeaching, Learning, and Learningto Teach*. Jossey-Bass, 2004

ReferenceBooks

1. *TeachingfortheFuture: EffectiveTeacherEducationandPedagogicalPractices*. OECD Publishing., 2021
2. Fullan, M., & Edwards, M. *SystemChangeinEducation: SustainabilityandImpact*. Routledge, 2022.
3. Coe, R., Rauch, C., Kime, S., & Singleton, D. *GreatTeachingToolkit: EvidenceReview*. Evidence Based Education., 2020
4. Zeichner, K.M. *TheStrugglefortheSoul ofTeacherEducation*. Routledge, 2024
5. UNESCO. *GlobalEducationMonitoringReport: Pedagogy, TeachersandLearning*. UNESCO Publishing, 2024
6. Hattie, J. *VisibleLearning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. Routledge., 2009
7. Darling-Hammond, L. *TeacherEducationAroundtheWorld: What Can We Learn from International Practice?* Routledge, 2007

Online Resources

- **UNESCO Education Resources**—<https://www.unesco.org/education>
- **OECD Education and Skills**—<https://www.oecd.org/education>
- **ERIC (Education Resources Information Center)**—<https://eric.ed.gov> (peer-reviewed papers, reports).
- **World Bank Education**—<https://www.worldbank.org/en/topic/education> (research reports on teacher development in developing countries).
- **NPTEL/SWAYAMMOOCs**—Teacher education and pedagogy-focused courses.
- **Google Scholar Alerts**—set alerts for "pedagogical practices", "teacher education", "curriculum research" for the latest academic papers.



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

	PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS	L	T	P	C
		2	0	0	0
Semester		II			
Course Objectives: This course will enable students:					
- To develop students' self-awareness by identifying their strengths, weaknesses, opportunities, and challenges (SWOC analysis). - To enable students to understand and apply the principles of emotional intelligence and effective interpersonal communication. - To cultivate positive thinking, resilience, mindfulness, and a growth-oriented mindset. - To enhance verbal and non-verbal communication skills, including confidence in public speaking and professional presentations. - To familiarize students with leadership styles, teamwork strategies, and collaborative problem-solving in personal and professional contexts.					
Course Outcomes (CO): Student will be able to					
1. Define and explain key concepts of self-awareness, personality, and personal growth. 2. Identify and apply strategies of emotional intelligence to regulate emotions and build effective interpersonal relationships 3. Demonstrate positive thinking, gratitude, and resilience to overcome personal and professional challenges 4. Analyze barriers to effective communication and apply verbal and non-verbal communication techniques in diverse contexts. 5. Prepare, deliver, and evaluate effective presentations and public speeches with confidence 6. Develop leadership and teamwork skills to collaborate, negotiate, and solve problems in group settings.					
UNIT –I		Self-Awareness and Personal Growth			
Understanding personality and its development-Identifying strengths, weaknesses, opportunities, and challenges (SWOC analysis)- Setting personal and professional goals- Practicing Self-Reflection and Journaling (Activities: Personality assessments, self-reflection exercises, group discussions, SWOC analysis worksheet, Action Plan, SMART goal activities, Reflective journaling, Self-care Planning)					
UNIT –II		Emotional Intelligence and Interpersonal Skills			
Understanding emotional intelligence and its importance -Developing self-awareness, self-regulation, and motivation - Building effective communication and interpersonal skills -Conflict resolution and negotiation strategies. (Activities: Emotional Intelligence Quiz, Self-Reflection exercises, feedback sessions, mindfulness exercises, Positives self-talk, Active Listening exercises, conflict-resolution Role-play, Case studies & Group activities)					
UNIT –III		Positive Thinking and Attitude			
Understanding the power of positive thinking-Developing a growth mindset and resilience - Practicing gratitude and mindfulness-Overcoming negative thoughts and behaviors (Activities on positive thinking, growth mindset, mindfulness and self-care plan for overcoming negative thoughts)					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

UNIT-IV	Effective Communication and Presentation Skills	
Understanding the importance of effective communication- Developing verbal and non-verbal communication skills-Preparing and delivering effective presentations-Building confidence and public speaking skills (Activities: Group discussions, Case studies, Role-Play, Non-verbal communication exercises, Practice presentations, Peer feedback, Public speaking exercises, Storytelling, Debates)		
UNIT-V	Leadership and Teamwork	
Understanding leadership styles and qualities-Developing leadership skills and qualities-Building effective teams and teamwork strategies- Practicing collaboration and problem-solving (Activities: Case studies, Group discussions, Debates, Leadership role-playing, team building activities, Group projects, Collaborative problem-solving exercises, feedback sessions)		
Prescribed Books 1. Daniel Goleman, <i>Emotional Intelligence: Why It Can Matter More Than IQ</i>, Bantam Books, 2017. 2. Stephen R. Covey, <i>The 7 Habits of Highly Effective People</i>, Simon & Schuster, 2020.		
Reference Books 1. Dale Carnegie, <i>How to Win Friends and Influence People</i>, Simon & Schuster, 2020. 2. Brian Tracy, <i>Goals!: How to Get Everything You Want Faster Than You Ever Thought Possible</i>, Berrett-Koehler Publishers, 2021. 3. Robin Sharma, <i>The 5AM Club: Own Your Morning, Elevate Your Life</i>, HarperCollins, 2020. 4. Carol S. Dweck, <i>Mindset: The New Psychology of Success</i>, Random House, 2016. 5. Daniel H. Pink, <i>Drive: The Surprising Truth About What Motivates Us</i>, Riverhead Books, 2018. 6. John C. Maxwell, <i>Leadership: 11 Essential Changes Every Leader Must Embrace</i>, HarperCollins, 2019.		
Online Resources 1. Coursera—Personal Development Specialization (https://www.coursera.org) 2. edX—Leadership and Emotional Intelligence Courses (https://www.edx.org) 3. FutureLearn—Mindfulness and Resilience Training (https://www.futurelearn.com) 4. MindTools—Practical resources on leadership, communication, and emotional intelligence (https://www.mindtools.com) 5. Positive Psychology—Articles and tools on resilience, gratitude, and well-being (https://positivepsychology.com) 6. TED Talks—Inspirational talks on leadership, communication, and self-growth (https://www.ted.com) 7. Harvard Business Review (HBR)—Leadership, negotiation, and workplace communication (https://hbr.org)		



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

YOGA FOR STRESS MANAGEMENT		L	T	P	C
		2	0	0	0
Semester		II			
Course Objectives:					
1. To make the students understand the foundational concepts of Yoga, including Ashtanga (eight limbs) as prescribed in classical texts. 2. To enable them analyze the principles of Yama and Niyama, and their role in ethical, personal, and social development. 3. To make them learn do's and don'ts of life through the practice of ahimsa, satya, astheya, brahmacharya, aparigraha, shaucha, santosh, tapa, swadhyaya, and ishwar-pranidhana. 4. To make them practice asanas and pranayama techniques for physical fitness, mental balance, and spiritual awareness. 5. To make them understand the holistic lifestyle through regular yoga practice, leading to personality development.					
Course Outcomes (CO): Student will be able to					
1. Explain the eight limbs of Yoga (Ashtanga) and their interrelationship in holistic development. 2. Demonstrate understanding of Yama and Niyama as ethical guidelines and apply them in personal and professional life. 3. Differentiate between do's and don'ts in daily life with reference to Yogic principles like ahimsa, satya, and swadhyaya. 4. Perform selected asanas and pranayama techniques with correct posture, breathing, and awareness. 5. Evaluate the physical, mental, and emotional benefits of yoga practices in stress reduction, concentration, and self-discipline. 6. Integrate yoga philosophy and practices into a personal routine for sustainable health and inner growth.					
UNIT-I					
Definition of Eight parts of yoga. (Ashtanga)					
UNIT-II					
Yama and Niyama.					
UNIT-III					
Do's and Don'ts in life.					
i) Ahimsa, satya, astheya, brahmacharya and aparigraha ii) Shaucha, santosh, tapa, swadhyaya, ishwar pranidhan					
UNIT-IV					
Asana and Pranayama					
UNIT-V					
i) Various yoga poses and their benefits for mind and body					
ii) Regularization of breathing techniques and its effects-Types of pranayama					
Textbooks					
1. Swami Prabhavananda and Christopher Isherwood (translation & commentary), <i>Patanjali Yoga Sutras</i>, Sri Ramakrishna Math, 1953. 2. B.K.S. Iyengar, <i>Light on Yoga</i>, Thorsons, 2003.					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

ReferenceBooks

1. T.K.V.Desikachar,*TheHeartofYoga:DevelopingaPersonalPractice*, InnerTraditions2nd Edition, 1999.
2. AcharyaYatendra,*Yoga&StressManagement*,FingerprintPublishers,2019
3. YaminiMuthanna,*ThePowerofYoga*, OmBooksInternational,2015.
4. NayaswamiDevarshi,*KriyaYoga:SpiritualAwakeningfortheNewAge*, AnandaSangha Publications, 2023.

Online Resources

- NPTEL/SWAYAMOnlineCourses–Yoga andPhysicalEducationmodules.
- AYUSHMinistryWebsite:<https://yoga.ayush.gov.in>–officialyogaresources,protocols, and research.
- YogaJournal:<https://www.yogajournal.com>–practicalguides,researchupdates,asana tutorials.
- ArtofLivingFoundation:<https://www.artofliving.org>–pranayama,meditation,and wellness practices.
- YouTubeChannels (scholarly&practice-based):
 - Sivananda Yoga Vedanta Centre
 - YogawithAdriene(forpracticalasana guidance)



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	ADHOCANDWIRELESSSENSORNETWORKS	L	T	P	C
	ProgramElective–V	3	0	0	3
Semester		III			
CourseObjectives:					
- To understand the various wireless networks - To analyze MAC, routing and transport layer protocols - To learn about the concepts of wireless sensor networks					
CourseOutcomes(CO):					
Students will be able to					
- Understand the various wireless networks - Analyze MAC, routing and transport layer protocols - Learn about the concepts of wireless sensor networks					
UNIT-I					LectureHrs:
WirelessLANsandPANs:Introduction,Fundamentals ofWLANS,IEEE802.11Standards, HIPERLAN Standard, Bluetooth, Home RF.					
ADHOCWIRELESSNETWORKS:Introduction,Issues inAdHocWirelessNetworks					
UNIT-II					LectureHrs:
MACProtocols:Introduction,Issues inDesigningaMACprotocol forAdHocWirelessNetworks, Designgoals ofaMACProtocol forAdHocWirelessNetworks,Classification ofMACProtocols, Contention - Based Protocols, Contention - Based Protocols with reservation Mechanisms, Contention – Based MAC Protocols with Scheduling Mechanisms, MAC Protocols that use DirectionalAntennas,OtherMACProtocols.					
UNIT-III					LectureHrs:
Routing Protocols: Introduction, Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks, Classification of Routing Protocols, Table –Driven Routing Protocols, On – Demand RoutingProtocols,HybridRoutingProtocols,RoutingProtocols withEfficientFlooding Mechanisms,HierarchicalRoutingProtocols,Power –AwareRoutingProtocols.					
UNIT-IV					LectureHrs:
Transport Layer Protocols: Introduction, Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of aTransportLayer Protocolfor AdHocWirelessNetworks, ClassificationofTransportLayerSolutions,TCPOverAdHocWirelessNetworks,Other TransportLayerProtocolforAdHocWirelessNetworks.					
UNIT-V					LectureHrs:
WirelessSensorNetworks:Introduction,SensorNetworkArchitecture,DataDissemination,Data Gathering, MAC Protocols for Sensor Networks, Location Discovery, Quality of a Sensor Network, Evolving Standards, Other Issues.					
Textbooks:					
- AdHocWirelessNetworks:ArchitecturesandProtocols -C.SivaRamMurthyandB.S.Manoj, 2004, PHI. - WirelessAd-hocandSensorNetworks:Protocols,PerformanceandControl – JagannathanSarangapani,CRCPress.					
ReferenceBooks:					
- Ad-HocMobileWirelessNetworks:Protocols&Systems,C.K.Toh,1stEd.Pearson Education. - WirelessSensorNetworks-C.S.Raghavendra,KrishnaM.Sivalingam,2004,Springer					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	VLSISIGNALPROCESSING ProgramElective-V	L	T	P	C
		3	0	0	3
Semester		III			
CourseObjectives:					
• TostudytheexistingarchitecturessuitableforVLSI. • Tounderstandtheconceptsoffoldingandunfoldingalgorithmsand applications. • TodesignnewarchitecturessuitableforVLSI. • Toimplementfastconvolutionalalgorithms.					
CourseOutcomes(CO):Studentwillbeable to					
• StudytheexistingarchitecturessuitableforVLSI. • Understandtheconceptsoffoldingandunfoldingalgorithmsand applications. • DesignnewarchitecturessuitableforVLSI. • Implementfastconvolutionalalgorithms.					
UNIT-I	LectureHrs:				
Introduction to DSP: Typical DSP algorithms, DSP algorithms benefits, Representation of DSP algorithms Pipelining and Parallel Processing Introduction, Pipelining of FIR Digital filters, Parallel Processing,PipeliningandParallelProcessingforLowPowerRetimingIntroduction,Definitions andProperties,SolvingSystemofInequalities,RetimingTechniques					
UNIT-II	LectureHrs:				
Folding and Unfolding: Folding- Introduction, Folding Transform, Register minimization Techniques, Register minimization in folded architectures, folding of Multirate systems Unfolding- Introduction,AnAlgorithmforUnfolding,PropertiesofUnfolding,criticalPath,Unfolding andRetiming,ApplicationsofUnfolding.					
UNIT-III	LectureHrs:				
SystolicArchitectureDesign:Introduction,SystolicArrayDesignMethodology,FIRSystolic Arrays,SelectionofSchedulingVector,MatrixMultiplicationand2DSystolicArrayDesign,Systolic Design for Space Representations contain Delays.					
UNIT-IV	LectureHrs:				
FastConvolution:Introduction-Cook-ToomAlgorithm-Winogardalgorithm-Iterated Convolution-CyclicConvolution-DesignofFastConvolutionalalgorithmbyInspection					
UNIT-V	LectureHrs:				
LowPowerDesign:Digitallatticefilterstructures,bitlevelarithmetic,architecture, redundant arithmetic.Numericalstrengthreduction,synchronous,waveandasynchronouspipelines,Scaling VsPowerConsumption,PowerAnalysis,PowerReductiontechniques,PowerEstimationApproaches					
Textbooks:					
1. KeshabK.Parthi,VLSIDigitalSignalProcessing-SystemDesignandImplementation,Wiley Inter Science, 1998. 2. KungS.Y,H.J.J.WhileHouse,T.Kailath,VLSIandModernSignalprocessing,PrenticeHall, 1985.					
ReferenceBooks					
1. JoseE.France,YannisTsividis,DesignofAnalog-DigitalVLSICircuitsfor TelecommunicationsandSignalProcessing,PrenticeHall,1994. 2. MedisetiV.K,VLSIDigitalSignalProcessing,IEEEPress(NY),1995					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

CourseCode	INDUSTRIALINTERNETOFTHINGS	L	T	P	C
	ProgramElective-V	3	0	0	3
Semester		III			
CourseObjectives:					
• TostudyaboutIoT,Sensors,IoTdevicesandtheirapplications. • TounderstandtheoperatingsystemsandnetworkingconceptsusedinIIoT deployments. • Tolearnthedata drivenanalytics andprotocolsforIoT. • TogainknowledgeontheIoTconceptsforlocalization,roboticandother applications.					
CourseOutcomes(CO):Studentwillbeable to					
• LearnaboutIoT,Sensors,IoTdevicesandtheirapplications. • GainknowledgeabouttheoperatingsystemsandnetworkingconceptsusedinIIoT deployments. • Implementthedata drivenanalyticsandprotocolsforIoT. • ApplytheIoTconceptsforlocalization,roboticandother applications.					
UNIT-I		LectureHrs:			
Introduction IIoT; Market Size and Potential: Definition, IoT v IIoT, Next Generation Sensors, Sensor’s calibration and validate sensor measurements, placement of IoT devices, sensors, low-cost communication system design, Top application areas include manufacturing, oil & gas, Embedded systems in the Automotive and Transportation market segment.					
UNIT-II		LectureHrs:			
IIoT Methodology: Top operating systems used in IIoT deployments, Networking and wireless communication protocols used in IIoT deployments. Smart Remote Monitoring Unit, components of monitoring system, control and management, Wireless Sensor Network (WSN)					
UNIT-III		LectureHrs:			
Data driven Analytics of IIoT: Implementing of industrial IoT Data flow, big data and how to prepare data for machine learning algorithms, Machine Learning algorithms, supervised learning & Un-supervisedlearningalgorithms, Basics ofneural network, activationfunctions, back-propagation.					
UNIT-IV		LectureHrs:			
IPandNon-IPProtocolsforIoT: WPAN,IEEE802.15.4,Bluetooth,NFC,6LoWPAN;RFID, Zigbee Wireless HART Protocol, MQTT, IP and Non-IP Protocols, REST, CoAP					
UNIT-V		LectureHrs:			
IoTCloudsandDataAnalytics:Developsapysics-basedanddata-drivendigitalequipmentmodel to monitor assets and systems, Introduction to device localization and tracking; different types of localization techniques, Radio-Frequency Identification (RFID) and fingerprinting, Device diversity/heterogeneity issue in IIoT networks					
Internet of Robotic Things (IoRT): Introduction to stationaryand mobile robots,Brief introduction to localization, mapping, planning, and control of robotic systems; Introduction to cloud-enabled robotics; Applications of IIoT in robotics; Architectures for IoRT, Examples and case studies: Open issues and challenges.					
Textbooks:					
1.IoTFundamentals:NetworkingTechnologies,ProtocolsandUseCasesforInternetofThings,					



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

- David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, Cisco Press, 2017.
- Internet of Things – A hands-on approach, Arshdeep Bahga, Vijay Madiseti, Universities Press, 2015
 - Industry 4.0: The Industrial Internet of Things, Alasdair Gilchrist, Apress, 2016—
 - Introduction to Industrial Internet of Things and Industry 4.0, Sudip Misra, Chandana Roy, Anadarup Mukherjee, CRC Press, 2021

Reference Books:

- The Internet of Things – Key applications and Protocols, Olivier Hersent, David Boswarthick, Omar Elloumi and Wiley, 2012 (for Unit 2).
- From Machine-to-Machine to the Internet of Things – Introduction to a New Age of Intelligence, Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stamatis, Karnouskos, Stefan Avesand, David Boyle and Elsevier, 2014.
- Architecting the Internet of Things, Dieter Uckelmann, Mark Harrison, Michahelles and Florian (Eds), Springer, 2011.
- Hands on Industrial Internet of Things, Giacomo Veneri, Antonio Capasso, Packt Press, 2018.

Course Code	IOT AND ITS APPLICATIONS	L	T	P	C
25D06302	3	0	0	3	

Course Objectives:

- ☐ To apply the Knowledge in IOT Technologies and Data management.
- ☐ To determine the values chains Perspective of M2M to IOT.
- ☐ To implement the state of the Architecture of an IOT.
- ☐ To compare IOT Applications in Industrial & real world.
- ☐ To demonstrate knowledge and understand the security and ethical issues of an IOT.

Course Outcomes (CO): Student will be able to

- ☐ Apply the Knowledge in IOT Technologies and Data management.
- ☐ Determine the values chains Perspective of M2M to IOT.
- ☐ Implement the state of the Architecture of an IOT.
- ☐ Compare IOT Applications in Industrial & real world.
- ☐ Demonstrate knowledge and understand the security and ethical issues of an IOT.

UNIT - I

Lecture Hrs:

Fundamentals of IoT: Evolution of Internet of Things, Enabling Technologies, IoT Architectures, oneM2M, IoT World Forum (IoTWF) and Alternative IoT models, Simplified IoT Architecture and Core IoT Functional Stack, Fog, Edge and Cloud in IoT, Functional blocks of an IoT ecosystem, Sensors, Actuators, Smart Objects and Connecting Smart Objects. IoT Platform overview: Overview of IoT supported Hardware platforms such as: Raspberry pi, ARM Cortex Processors, Arduino and Intel Galileo boards.

UNIT - II

Lecture Hrs:

IoT Protocols: IT Access Technologies: Physical and MAC layers, topology and Security of IEEE 802.15.4, 802.15.4g, 802.15.4e, 1901.2a, 802.11ah and Lora WAN, Network Layer: IP versions, Constrained Nodes and



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

Constrained Networks, Optimizing IP for IoT: From 6LoWPAN to 6Lo, Routing over Low Power and Lossy Networks, Application Transport Methods: Supervisory Control and Data Acquisition, Application Layer Protocols: CoAP and MQTT.

UNIT - III

Lecture Hrs:

Design and Development: Design Methodology, Embedded computing logic, Microcontroller, System on Chips, IoT system building blocks, Arduino, Board details, IDE programming, Raspberry Pi, Interfaces and Raspberry Pi with Python Programming.

UNIT - IV

Lecture Hrs:

Data Analytics and Supporting Services: Structured Vs Unstructured Data and Data in Motion Vs Data in Rest, Role of Machine Learning – No SQL Databases, Hadoop Ecosystem, Apache Kafka, Apache Spark, Edge Streaming Analytics and Network Analytics, Xively Cloud for IoT, Python Web Application Framework, Django, AWS for IoT, System Management with NETCONF-YANG.

UNIT - V

Lecture Hrs:

Case Studies/Industrial Applications: IoT applications in home, infrastructures, buildings, security, Industries, Home appliances, other IoT electronic equipments. Use of Big Data and Visualization in IoT, Industry 4.0 concepts. Sensors and sensor Node and interfacing using any Embedded target boards (Raspberry Pi / Intel Galileo/ARM Cortex/ Arduino).

Textbooks:

1. IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, Cisco Press, 2017.
2. Internet of Things – A hands-on approach, Arshdeep Bahga, Vijay Madisetti, Universities Press, 2015

Reference Books:

1. The Internet of Things – Key applications and Protocols, Olivier Hersent, David Boswarthick, Omar Elloumi and Wiley, 2012 (for Unit 2).
2. —From Machine-to-Machine to the Internet of Things – Introduction to a New Age of Intelligencel, Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stamatis, Karnouskos, Stefan Avesand. David Boyle and Elsevier, 2014.
3. Architecting the Internet of Things, Dieter Uckelmann, Mark Harrison, Michahelles and Florian (Eds), Springer, 2011.

CourseCode	IOTANDITS APPLICATIONS			
	L	T	P	C
	3	0	0	3
CourseObjectives:				
- To apply the knowledge in IoT Technologies and Data management. - To determine the value chains Perspective of M2M to IoT. - To implement the state of the Architecture of an IoT. - To compare IoT Applications in Industrial & real world. - To demonstrate knowledge and understand the security and ethical issues of an IoT.				
CourseOutcomes(CO): Student will be able to				



Dr. K. V. Subba Reddy Institute of Technology

(Autonomous)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Ananthapuramu)

Accredited by NBA Recognized under Section 2 (f) and 12B of UGC Act, 1956

Website: www.drkvsrit.ac.in Email: drkvsr.principal@gmail.com

ISO 9001: 2015 & ISO 14001: 2015 Certified Institution



R25 Regulations

• Apply the Knowledge in IOT Technologies and Data management. • Determine the value chains Perspective of M2M to IOT. • Implement the state of the Architecture of an IOT. • Compare IOT Applications in Industrial & real world. • Demonstrate knowledge and understand the security and ethical issues of an IOT.		
UNIT-I		Lecture Hrs:
Fundamentals of IoT: Evolution of Internet of Things, Enabling Technologies, IoT Architectures, oneM2M, IoT World Forum (IoTWF) and Alternative IoT models, Simplified IoT Architecture and Core IoT Functional Stack, Fog, Edge and Cloud in IoT, Functional blocks of an IoT ecosystem, Sensors, Actuators, Smart Objects and Connecting Smart Objects. IoT Platform overview: Overview of IoT supported Hardware platforms such as: Raspberry Pi, ARM Cortex Processors, Arduino and Intel Galileo boards.		
UNIT-II		Lecture Hrs:
IoT Protocols: IT Access Technologies: Physical and MAC layers, topology and Security of IEEE 802.15.4, 802.15.4g, 802.15.4e, 1901.2a, 802.11ah and Lora WAN, Network Layer: IP versions, Constrained Nodes and Constrained Networks, Optimizing IP for IoT: From 6LoWPAN to 6Lo, Routing over Low Power and Lossy Networks, Application Transport Methods: Supervisory Control and Data Acquisition, Application Layer Protocols: CoAP and MQTT.		
UNIT-III		Lecture Hrs:
Design and Development: Design Methodology, Embedded computing logic, Microcontroller, System on Chips, IoT system building blocks, Arduino, Board details, IDE programming, Raspberry Pi, Interfaces and Raspberry Pi with Python Programming.		
UNIT-IV		Lecture Hrs:
Data Analytics and Supporting Services: Structured Vs Unstructured Data and Data in Motion Vs Data in Rest, Role of Machine Learning – No SQL Databases, Hadoop Ecosystem, Apache Kafka, Apache Spark, Edge Streaming Analytics and Network Analytics, Xively Cloud for IoT, Python Web Application Framework, Django, AWS for IoT, System Management with NETCONF-YANG.		
UNIT-V		Lecture Hrs:
Case Studies/Industrial Applications: IoT Applications in home, infrastructures, buildings, security, Industries, Home appliances, other IoT electronic equipments. Use of Big Data and Visualization in IoT, Industry 4.0 concepts. Sensors and sensor Node and interfacing using any Embedded target boards (Raspberry Pi/Intel Galileo/ARM Cortex/ Arduino).		
Textbooks:		
1. IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, Cisco Press, 2017. 2. Internet of Things – A hands-on approach, Arshdeep Bahga, Vijay Madisetti, Universities Press, 2015		
Reference Books:		
1. The Internet of Things – Key applications and Protocols, Olivier Hersent, David Boswarthick, Omar Elloumi and Wiley, 2012 (for Unit 2). 2. —From Machine-to-Machine to the Internet of Things – Introduction to a New Age of Intelligence, Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stamatis, Karnouskos, Stefan Avesand. David Boyle and Elsevier, 2014. 3. Architecting the Internet of Things, Dieter Uckelmann, Mark Harrison, Michahelles and Florian (Eds), Springer, 2011.		