



**MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AUTONOMOUS)**

2015503: MICROCONTROLLERS & PROGRAMMABLE DIGITAL SIGNAL PROCESSORS

I Year M.Tech (ES) I – Sem.

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Course Objectives:

- To understand the various applications of ARM processors
- To analyze the interrupt operations of ARM Processors
- To understand the operation of LPC17xx microcontroller
- To understand about different programmable DSP architectures
- To design the various logical operations using VLIW processors

Course Outcomes:

At the end of this course, students will be able to

- Compare and select ARM processor core based SoC with several features/peripherals based on requirements of embedded applications
- Identify and characterize architecture of Programmable DSP Processors
- Develop small applications by utilizing the ARM processor core and DSP processor based platform
- Learn about various interrupt handling mechanisms in ARM processors
- Design of logical applications using programmable DSP processors

UNIT-I

ARM Cortex-M3 processor: Applications, Programming model – Registers, Operation - modes, Exceptions and Interrupts, Reset Sequence Instruction Set, Unified Assembler Language, Memory Maps, Memory Access Attributes, Permissions, Bit-Band Operations, Unaligned and Exclusive Transfers. Pipeline, Bus Interfaces.

Learning Outcomes: At the end of the unit, the student will be able to

- Describe the Architecture of ARM processor
- Summarize the operational modes of ARM processor
- Illustrate the various applications of ARM processor

UNIT-II

Exceptions, Types, Priority, Vector Tables, Interrupt Inputs and Pending behaviour, Fault Exceptions, Supervisor and Pendable Service Call, Nested Vectored Interrupt Controller, Basic Configuration, SYSTICK Timer, Interrupt Sequences, Exits, Tail Chaining, Interrupt Latency.

Learning Outcomes: At the end of the unit, the student will be able to

- Describe the various interrupts in ARM processor
- Summarize the Exception handling mechanisms of ARM processors
- Illustrate the various interrupt behavior of ARM processor

UNIT-III

LPC 17xx microcontroller- Internal memory, GPIOs, Timers, ADC, UART and other serial interfaces, PWM, RTC, WDT.

Learning Outcomes: At the end of the unit, the student will be able to

- Describe the Architecture of LPC 17xx microcontroller
- Summarize the operational modes of LPC 17xx microcontroller
- Illustrate the various applications of LPC 17xx microcontroller



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UNIT-IV

Programmable DSP (P-DSP) Processors: Harvard architecture, Multi port memory, architectural structure of P-DSP- MAC unit, Barrel shifters, Introduction to TI DSP processor family.

Learning Outcomes: At the end of the unit, the student will be able to

- Describe the concepts of programmable DSP Processors
- Demonstrate the various blocks of programmable DSP Processors
- Illustrate the concepts of TI DSP processor family

UNIT-V

VLIW architecture and TMS320C6000 series, architecture study, data paths, cross paths, Introduction to Instruction level architecture of C6000 family, Assembly Instructions memory addressing, for arithmetic, logical operations.

Learning Outcomes: At the end of the unit, the student will be able to

- Describe the concepts of TMS320C6000 series Processors
- Demonstrate the various arithmetic and logical operations of TMS320C6000 series Processors
- Illustrate the programmable instruction set of C6000 family processors

TEXT BOOKS:

1. Joseph Yiu, "The definitive guide to ARM Cortex-M3", Elsevier, 2nd Edition
2. Venkatramani B. and Bhaskar M. "Digital Signal Processors: Architecture, Programming and Applications" , TMH , 2nd Edition

REFERENCES:

1. Sloss Andrew N, Symes Dominic, Wright Chris, "ARM System Developer's Guide: Designing and Optimizing", Morgan Kaufman Publication.
2. Steve furber, "ARM System-on-Chip Architecture", Pearson Education
3. Frank Vahid and Tony Givargis, "Embedded System Design", Wiley.



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2015504: SYSTEM DESIGN WITH EMBEDDED LINUX

I Year M.Tech (ES) I – Sem.

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Course Objectives:

- To provide a basic understanding of the Linux OS and the Eclipse IDE framework
- To understand the complexities of Embedded Linux Distributions in embedded systems
- To understand the process of configuring, booting and testing the Embedded Linux distributions and applications running on Embedded Linux target systems
- Enable students to analyze and develop software programs for embedded systems
- Develop an understanding of the technologies behind the embedded computing systems

Course Outcomes:

At the end of this course, students will be able to

- Appreciate the principles of the embedded Linux development model
- Develop the code for profile applications and drivers in embedded Linux
- Appreciate and create Linux BSP for a hardware platform
- Familiarity of the embedded Linux development model
- Write, debug, and profile applications and drivers in embedded Linux

UNIT - I

Introduction to Real Time Operating Systems: Characteristics of RTOS, Tasks Specifications and types, Real-Time Scheduling Algorithms, Concurrency, Inter-process Communication and Synchronization mechanisms, Priority Inversion, Inheritance and Ceiling.

Embedded Linux Vs Desktop Linux, Embedded Linux Distributions, System calls, Static and dynamic libraries, Cross tool chains.

Learning Outcomes: At the end of the unit, the student will be able to

- Overview of the real-time scheduling algorithms and mechanisms
- Understand Synchronization mechanisms
- Understand the state-of-the-art in embedded Linux Libraries

UNIT - II

Embedded Linux Architecture, Kernel Architecture – HAL, Memory manager, Scheduler, File System, I/O and Networking subsystem, IPC, User space, Start-up sequence.

Learning Outcomes: At the end of the unit, the student will be able to

- Implement Embedded systems with Embedded operating systems
- Develop applications with Embedded Linux
- Understand Synchronization mechanisms

UNIT - III

Board Support Package Embedded Storage: MTD, Architecture, Drivers, Embedded File System. Embedded Device Drivers: Communication between user space and kernel space drivers, Character and Block Device Drivers, Interrupt handling, Kernel modules.

Embedded Drivers: Serial, Ethernet, I2 C, USB, Timer, Kernel Modules.

Learning Outcomes: At the end of the unit, the student will be able to

- Overview of Kernel modules
- Understand the state-of-the-art in embedded Linux Libraries



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- Port the OS with applications.

UNIT - IV

Porting Applications Real-Time Linux: Linux and Real time, Programming, Hard Real-time Linux.

Learning Outcomes: At the end of the unit, the student will be able to

- Develop Embedded Real Time software that is required to run embedded systems.
- Develop real-time applications using RTOS.
- Build real-time embedded systems using RTOS.

UNIT - V

Building and Debugging: Boot loaders, Kernel, Root file system, Device Tree.

Learning Outcomes: At the end of the unit, the student will be able to

- Apply product development process for realization of the product.
- Develop real-time applications using free RTOS.
- Build real-time embedded systems using free RTOS and VxWorks RTOS.

Text Books:

1. Chris Simmonds "Mastering Embedded Linux Programming" - Second Edition, PACKT Publications Limited.
2. Karim Yaghmour, "Building Imbedded Linux Systems", O'Reilly & Associates.

Reference Books:

1. P Raghvan, Amol Lad, Sriram Neelakandan, "Embedded Linux System Design and Development", Auerbach Publications.
2. Christopher Hallinan, "Embedded Linux Primer: A Practical Real World Approach", Prentice Hall, 2nd Edition, 2010.
3. Derek Molloy, "Exploring Beagle Bone: Tools and Techniques for Building with Embedded Linux", Wiley, 1st Edition, 2014.



MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
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2015507: PROGRAMMING LANGUAGES FOR EMBEDDED SOFTWARE
(PE- I)

I Year M.Tech (ES) I – Sem.

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Course Objectives:

- To explore the difference between general purpose programming languages and Embedded Programming Language
- Get knowledge in Embedded OS (Linux) fundamentals
- It aims at familiarizing the students in embedded concepts and programming in 'C'
- To provide case studies for programming in embedded systems
- Differentiate interpreted languages from compiled languages

Course Outcomes:

At the end of this course, the students will be able to

- Write simple programs and implement the same embedded hardware.
- Develop and analyze algorithms in C++
- Write an embedded C application of moderate complexity
- Differentiate interpreted languages from compiled languages
- Develop programs using scripting languages

UNIT-I

Embedded 'C' Programming: Bitwise operations, Dynamic memory allocation, OS services, Linked stack and queue, Sparse matrices, Binary tree, Interrupt handling in C, Code optimization issues, Writing LCD drives, LED drivers, Drivers for serial port communication, Embedded Software Development Cycle and Methods (Waterfall, Agile).

Learning Outcomes: At the end of this unit, the students will be able to

- Write an embedded C application of moderate complexity
- Develop and analyze algorithms in C
- Differentiate interpreted languages from compiled languages

UNIT-II

CPP Programming: 'cin', 'cout', formatting and I/O manipulators, new and delete operators, Defining a class, data members and methods, 'this' pointer, constructors, destructors, friend function, dynamic memory allocation.

Learning Outcomes: At the end of this unit, the students will be able to

- Develop and analyze algorithms in C++
- Analyze different types of I/O manipulators and their operation
- Understand the class, data members and their function

UNIT-III

Overloading and Inheritance: Need of operator overloading, overloading the assignment, overloading using friends, type conversions, single inheritance, base and derived classes, friend classes, types of inheritance, hybrid inheritance, multiple inheritance, virtual base class, polymorphism, virtual functions.

Learning Outcomes: At the end of this unit, the students will be able to

- Understand the need of operator overloading
- Find the difference between types of inheritance, hybrid inheritance, multiple inheritance
- Acquire knowledge on polymorphism, virtual functions



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UNIT-IV

Templates: Function template and class template, member function templates and template arguments, Exception Handling: syntax for exception handling code: try-catch-throw, Multiple Exceptions.

Learning Outcomes: At the end of this unit, the students will be able to

- Explain the different types function template and class template
- Understand the concept of Exception Handling
- Analyze the multiple exceptions

UNIT-V

Scripting Languages Overview of Scripting Languages – PERL, CGI, VB Script, Java Script.

PERL: Operators, Statements Pattern Matching etc. Data Structures, Modules, Objects, Tied Variables, Inter process Communication Threads, Compilation & Line Interfacing.

Learning Outcomes: At the end of this unit, the students will be able to

- Explain the Overview of Scripting Languages
- Understand the basics of Operators, Statements Pattern Matching in PERL
- Analyze the different concepts in Inter process Communication Threads

TEXT BOOKS:

1. Michael J. Pont, "Embedded C", Pearson Education, 2nd Edition, 2008.
2. Randal L. Schwartz, "Learning Perl", O'Reilly Publications, 6th Edition 2011.

REFERENCES:

1. A. Michael Berman, "Data structures via C++", Oxford University Press, 2002.
2. Robert Sedgewick, "Algorithms in C++", Addison Wesley Publishing Company, 1999.
3. Abraham Silberschatz, Peter B, Greg Gagne, "Operating System Concepts", John Willey & Sons, 2005.



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**2015508: AI & MACHINE LEARNING
(PE- I)**

I Year M.Tech (ES) I – Sem.

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Course Objectives:

- To be able to formulate machine learning problems corresponding to different applications
- To understand a range of machine learning algorithms along with their strengths and weaknesses
- To understand the basic theory underlying machine learning
- To understand computational learning theory
- To study the pattern comparison techniques

Course Outcomes:

At the end of this course, students will be able to

- Student should be able to understand the basic concepts such as decision tree and neural networks.
- Ability to formulate machine learning techniques to solve respective problems.
- Understand the concepts of computational intelligence like machine learning.
- Ability to get the skill to apply machine learning techniques to address the real-time problems in different areas.
- Understand the Neural Networks and its usage in machine learning applications.

UNIT - I

Supervised Learning (Regression/Classification). Basic methods: Distance-based methods, Nearest-Neighbors, Decision Trees, Naive Bayes. Linear models: Linear Regression, Logistic Regression, Generalized Linear Models Support Vector Machines, Nonlinearity and Kernel Methods.

Beyond Binary Classification: Multi-class/Structured Outputs, Ranking.

Learning Outcomes: At the end of this unit, the students will be able to

- Understand complexity of Machine Learning algorithms and their limitations
- Understand modern notions in data analysis-oriented computing
- Explore supervised and unsupervised learning paradigms of machine learning

UNIT-II

Unsupervised Learning

Clustering: K-means/Kernel K-means Dimensionality Reduction: PCA and kernel PCA Matrix Factorization and Matrix Completion

Generative Models (mixture models and latent factor models)

Learning Outcomes: At the end of this unit, the students will be able to

- Be capable of confidently applying common Machine Learning algorithms in practice and implementing their own
- Extract features that can be used for a particular machine learning approach in various IOT applications.
- To compare and contrast pros and cons of various machine learning techniques and to get an insight of when to apply a particular machine learning approach.

UNIT-III

Evaluating Machine Learning algorithms and Model Selection, Introduction to Statistical Learning Theory, Ensemble Methods (Boosting, Bagging, Random Forests).

Learning Outcomes: At the end of this unit, the students will be able to

- To mathematically analyze various machine learning approaches and paradigms
- Be capable of performing experiments in Machine Learning using real-world data



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- To learn the concept of how to learn patterns and concepts from data.

UNIT-IV

Biological foundations to intelligent Systems: Artificial Neural Networks. Single layer and Multilayer Feed Forward NN, LMS and Back Propagation. Algorithm, Feedback networks and Radial Basis Function Networks.

Learning Outcomes: At the end of this unit, the students will be able to

- Understand modern notions in data analysis-oriented computing
- Capable of confidently applying common Machine Learning algorithms in practice and implementing their own
- Analyze and design the different types of intelligent systems

UNIT-V

Fuzzy Logic, Knowledge Representation and Inference Mechanism, Defuzzification Methods Fuzzy Neural Networks and some algorithms to learn the parameters of the network like GA.

Learning Outcomes: At the end of this unit, the students will be able to

- To learn the Deep learning technique and various feature extraction strategies
- Analyze various machine learning algorithms and techniques with a modern outlook focusing on recent advances
- Understand complexity of Machine Learning algorithms and their limitations

TEXT BOOKS:

1. Kevin Murphy, Machine Learning: A Probabilistic Perspective, MIT Press, 2012.
2. Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements of Statistical Learning, Springer 2009 (freely available online).

REFERENCE BOOKS:

1. Christopher Bishop, Pattern Recognition and Machine Learning, Springer, 2007.
2. J M Zurada , "An Introduction to ANN", Jaico Publishing House
3. Simon Haykins, "Neural Networks", Prentice Hall



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**2015509: COMPUTER VISION
(PE- I)**

I Year M.Tech (ES) I – Sem.

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Course Objectives:

- To explore the difference between human vision and computer vision
- To provide knowledge in camera model
- To provide knowledge on shape representation
- To familiarize the concepts of motion detection and estimation
- To understand various algorithms used for object recognition

Course Outcomes:

At the end of this course, students will be able to

- Understand the image formation models and feature extraction for computer vision
- Perform segmentation and motion detection on video
- Develop small applications and detect the objects in various applications
- Implement algorithms for object detection and classification
- Understand the concepts of stereo vision

UNIT-I

Image Formation Models: Monocular imaging system, Orthographic & Perspective Projection, Camera model and Camera calibration, Binocular imaging systems, Perspective, Binocular Stereopsis: Camera and Epipolar Geometry; Homography, Rectification, DLT, RANSAC, 3-D reconstruction framework; Auto-calibration. Apparel, Stereo vision.

Learning Outcomes: At the end of this unit, the students will be able to

- Explain the camera model and camera calibration
- Understand the concept of 3D reconstruction framework
- Explain the concepts of stereo vision

UNIT-II

Feature Extraction: Image representations (continuous and discrete), Edge detection, Edge linking, corner detection, texture, binary shape analysis, boundary pattern analysis, circle and ellipse detection, Light at Surfaces; Phong Model; Reflectance Map; Albedo estimation; Photometric Stereo; Use of Surface Smoothness Constraint; Shape from Texture, color, motion and edges.

Learning Outcomes: At the end of this unit, the students will be able to

- Explain the features used for representing an object
- Understand the concept of pattern analysis
- Explain the principles of lighting for computer vision

UNIT-III

Shape Representation and Segmentation: Deformable: Curves and surfaces, Snakes and active contours Level set representations, Fourier and wavelet descriptors, Medial representations, Multi-resolution analysis, Region Growing, Edge Based approaches to segmentation, Graph-Cut, Mean-Shift, MRFs, Texture Segmentation.

Learning Outcomes: At the end of this unit, the students will be able to

- Explain the algorithms used for shape representation
- Understand the concept of segmentation
- Understand various algorithms used for segmentation.



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UNIT-IV

Motion Detection and Estimation: Regularization theory, Optical computation, Stereo Vision Motion estimation, Background Subtraction and Modelling, Optical Flow, KLT, Spatio- Temporal Analysis, Dynamic Stereo; Motion parameter estimation, Structure from motion, Motion Tracking in Video.

Learning Outcomes: At the end of this unit, the students will be able to

- Explain the concept of stereo vision
- Understand the principles of optical computation
- Understand the concept of motion tracking in video

UNIT-V

Object recognition: Hough transforms and other simple object recognition methods, Shape correspondence and shape matching, Principal component analysis, Shape priors for recognition.

Learning Outcomes: At the end of this unit, the students will be able to

- Explain the concept of object recognition
- Understand the methods for object recognition
- Understand the principle of shape matching

Text Books:

1. D. Forsyth and J. Ponce, "Computer Vision - A modern approach", 2nd Edition, Pearson Prentice Hall, 2012
2. Szeliski, Richard, "Computer Vision: Algorithms and Applications", 1st Edition, Springer-Verlag London Limited, 2011.

REFERENCES:

1. Richard Hartley and Andrew Zisserman, "Multiple View Geometry in Computer Vision", 2nd Edition, Cambridge University Press, 2004.
2. K. Fukunaga, "Introduction to Statistical Pattern Recognition", 2nd Edition, Morgan Kaufmann, 1990.
3. Rafael C. Gonzalez and Richard E. Woods, "Digital Image Processing", 3rd Edition,



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**2015510: COMMUNICATION BUSES & INTERFACES
(PE-II)**

I Year M.Tech (ES) I – Sem.

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Pre-requisite: Nil

Course Objectives:

- To understand the concepts interfacing
- To study the design concepts of various buses
- To know the architecture of communication system
- To analyze different types of hardware and software in interface design
- To understand various protocols in interfacing

Course Outcomes:

At the end of this course, students will be able to

- Understand various buses and interfaces
- Conclude the use of different communication channels
- Select a particular serial bus suitable for a particular application
- Develop APIs for configuration, reading and writing data onto serial bus
- Design and develop peripherals that can be interfaced to desired serial bus

UNIT - I

Serial Buses: Physical interface, Data and Control signals, features, limitations and applications of RS232, RS485, I2C, SPI.

Learning Outcomes: At the end of the unit, the student will be able to

- Analyze different types of serial communication interfaces
- Conclude the use of various control signals
- Design a serial communication interface for embedded system

UNIT - II

CAN: Architecture, Data transmission, Layers, Frame formats, applications.

Learning Outcomes: At the end of the unit, the student will be able to

- Understand Control Area Network (CAN) protocol
- Understand the frame formats of CAN
- Acquire knowledge on the applications of CAN

UNIT - III

PCIe: Revisions, Configuration space, Hardware protocols, applications.

Learning Outcomes: At the end of the unit, the student will be able to

- Understand the concept of PCI Express (PCIe)
- Explain the working operation and configuration of PCIe
- Identify the applications of PCIe

UNIT - IV

USB: Transfer types, enumeration, Descriptor types and contents, Device driver.

Learning Outcomes: At the end of the unit, the student will be able to

- Explain the different transfer types in USB
- Understand the working operation of USB
- Analyze the various versions of USB



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UNIT - V

High Speed Data Transfer: Data Streaming Serial Communication Protocol - Serial Front Panel Data Port (SFPDP) using fiber optic and copper cable.

Learning Outcomes: At the end of the unit, the student will be able to

- Analyze and design the different types of data streaming protocols
- Conclude the methods for speed improvement
- Explain the operation of different data streaming protocols

Text Books:

1. Jan Axelson, "Serial Port Complete - COM Ports, USB Virtual Com Ports, and Ports for Embedded Systems", Lakeview Research, 2nd Edition.
2. Jan Axelson, "USB Complete", Penram Publications.

Reference Books:

1. Mike Jackson, Ravi Budruk, "PCI Express Technology", Mindshare Press.
2. Wilfried Voss, "A Comprehensible Guide to Controller Area Network", Copperhill Media Corporation, 2nd Edition, 2005.
3. Serial Front Panel Draft Standard VITA 17.1 – 200x.



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**2015511: PARALLEL PROCESSING
(PE-II)**

I Year M.Tech (ES) I – Sem.

L T P C

3 0 0 3

Pre-requisite: Knowledge on Microcontrollers and digital programmable processors.

Course Objectives:

- The course gives an overview of the parallel processing with Pipelining techniques
- To understand the multi-processor architectures
- To familiarize students with the fundamental tools of parallel processing
- To the foundations for development of efficient parallel programming techniques
- To design algorithm in application area on parallel processing platforms

Course Outcomes:

At the end of this course, students will be able to

- Understand the different types of pipelining techniques
- Understand the concepts of parallel processing
- Identify limitations of different architectures of computer
- Analysis quantitatively the performance parameters for different architectures
- Investigate issues related to compilers and instruction set based on type of architectures

UNIT-I

Overview of Parallel Processing and Pipelining, Performance analysis, Scalability, Principles and implementation of Pipelining, Classification of pipelining processors, Advanced pipelining techniques, Software pipelining

Learning Outcomes: At the end of the unit, the student will be able to

- Understand the concepts of parallel processing
- Understand the principles of Pipelining techniques
- Conclude the use of different Pipelining techniques

UNIT-II

VLIW processors: Case study: Superscalar Architecture- Pentium, Intel Itanium Processor, Ultra SPARC, MIPS on FPGA, Vector and Array Processor, FFT Multiprocessor Architecture.

Learning Outcomes: At the end of the unit, the student will be able to

- Understand the multi-processor architecture
- Understand the limitations of different architectures of computer
- Familiar with the parallel computing models

UNIT-III

Multithreaded Architecture, Multithreaded processors, Latency hiding techniques, Principles of multithreading, Issues and solutions.

Learning Outcomes: At the end of the unit, the student will be able to

- will be able to apply the basic algorithmic techniques
- Understand the “parallel-way of thinking” required in the design of parallel algorithms
- Develop, analyze, and implement algorithms for parallel computers



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UNIT-IV

Parallel Programming Techniques: Message passing program development, Synchronous and asynchronous message passing, Shared Memory Programming, Data Parallel Programming, Parallel Software Issues.

Learning Outcomes: At the end of the unit, the student will be able to

- Analyze different types of parallel programming techniques
- design algorithms in a shared memory as well as a distributed memory environment
- Problem solving using parallel computers with shared memory and with distributed memory

UNIT-V

Operating systems for multiprocessors systems, Customizing applications on parallel processing platforms.

Learning Outcomes: At the end of the unit, the student will be able to

- Design algorithms for specific applications
- Analyze different types of algorithms for multiprocessing
- Develop a applications on parallel processing platforms

TEXT BOOKS:

1. Kai Hwang, Faye A. Briggs, "Computer Architecture and Parallel Processing", MGH International Edition.
2. Kai Hwang, "Advanced Computer Architecture", TMH.

REFERENCES:

1. V. Rajaraman, L. Sivaram Murthy, "Parallel Computers", PHI.
2. William Stallings, "Computer Organization and Architecture, Designing for performance" Prentice Hall, 6th edition.
3. Kai Hwang, Zhiwei Xu, "Scalable Parallel Computing", MGH.



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**2015512: ADVANCED COMPUTER ARCHITECTURE
(PE-II)**

I Year M.Tech (ES) I – Sem.

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3 0 0 3

Pre-requisite: Basics of Microprocessors and Microcontrollers

Course Objectives:

- To make students know about the parallelism concepts in programming
- To give the students an elaborate idea about the different memory systems and buses
- To introduce the advanced processor architectures to the students
- To make the students know about the importance of multiprocessor and multicomputer
- To study about data flow computer architectures

Course Outcomes:

At the end of this course, students will be able to

- Demonstrate concepts of parallelism in hardware/software
- Discuss memory organization and mapping techniques
- Describe architectural features of advanced processors
- Interpret performance of different pipelined processors
- Explain data flow in arithmetic algorithms

UNIT - I:

Fundamentals of Computer Design: Fundamentals of Computer design, Changing faces of computing and task of computer designer, Technology trends, Cost price and their trends, measuring and reporting performance, quantitative principles of computer design, Amdahl's law.

Instruction set principles and examples- Introduction, classifying instruction set- memory addressing-type and size of operands, operations in the instruction set.

Learning Outcomes: At the end of the unit, the student will be able to

- Analyze various trends in computer design
- Analyze the performance of a computer
- Understand addressing modes and instruction set

UNIT - II

Data Pipelines: Introduction, basic RISC instruction set, Simple implementation of RISC instruction set, Classic five stage pipe line for RISC processor, Basic performance issues in pipelining, Pipeline hazards, Reducing pipeline branch penalties.

Memory Hierarchy Design: Introduction, review of ABC of cache, Cache performance, Reducing cache miss penalty, Virtual memory.

Learning Outcomes: At the end of the unit, the student will be able to

- Understand pipelining and issues related to it
- Understand the basics of reduced instruction set computing
- Acquire knowledge on memory hierarchy design

UNIT - III

Instruction Level Parallelism the Hardware Approach: Instruction-Level parallelism, Dynamic scheduling, Dynamic scheduling using Tomasulo's approach, Branch prediction, high performance instruction delivery- hardware based speculation.

ILP Software Approach: Basic compiler level techniques, static branch prediction, VLIW approach,



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Exploiting ILP, Parallelism at compile time, Cross cutting issues -Hardware verses Software.

Learning Outcomes: At the end of the unit, the student will be able to

- Understand the concept of parallelism
- Explain Dynamic Scheduling
- Identify the compiler level techniques for ILP

UNIT - IV

Multi Processors and Thread Level Parallelism: Multi Processors and Thread level Parallelism- Introduction, Characteristics of application domain, Systematic shared memory architecture, Distributed shared – memory architecture, Synchronization.

Learning Outcomes: At the end of the unit, the student will be able to

- Explain the different types of parallelism
- Understand the characteristics of application domain
- Analyze various shared memory architecture

UNIT - V

Inter Connection and Networks: Introduction, Interconnection network media, Practical issues in interconnecting networks, Examples of inter connection, Cluster, Designing of clusters.

Intel Architecture: Intel IA- 64 ILP in embedded and mobile markets Fallacies and pit falls.

Learning Outcomes: At the end of the unit, the student will be able to

- Analyze and design clusters
- Conclude the practical constraints in interconnecting networks
- Explain the Intel IA- 64 ILP architecture

Text Books:

1. John L. Hennessy, David A. Patterson, "Computer Architecture: A Quantitative Approach", 3rd Edition, Elsevier.
2. Kai Hwang, "Advanced Computer Architecture" Second Edition, Tata McGraw Hill Publishers.

Reference Books:

1. John P. Shen and Miikko H. Lipasti, "Modern Processor Design: Fundamentals of Super Scalar Processors", 2002, Beta Edition, McGraw-Hill
2. Kai Hwang, Faye A.Brigs., "Computer Architecture and Parallel Processing", Mc Graw Hill.
3. Dezso Sima, Terence Fountain, Peter Kacsuk, "Advanced Computer Architecture - A Design Space Approach", Pearson Education.



**MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
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**2015521: MICROCONTROLLERS & PROGRAMMABLE DIGITAL SIGNAL
PROCESSORS LAB**

I Year M.Tech (ES) I – Sem.

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Course Objectives:

- The students familiarize the assembling language programming and interfacing with various modules
- Interface various I/O peripherals like ADC, DAC, Keyboard, stepper motor etc., with microprocessors using 8255 PPI.
- Any type of industrial and real time applications by knowing the concepts of Microprocessor and Microcontrollers.
- Understand of 8051 Microcontroller concepts, architecture, programming and application of Microcontrollers.
- Demonstrate basic knowledge of Microcontrollers & Interfacing by understanding the architecture of 8051 controller.

Course Outcomes:

At the end of the laboratory work, students will be able to

- Install, configure and utilize tool sets for developing applications based on ARM processor core SoC and DSP processor.
- Develop prototype codes using commonly available on and off chip peripherals on the Cortex M3 and DSP development boards.
- Design computers like desktops, laptops using various processors.
- Understand the full internal workings of a typical simple CPU including the utilization of the various hardware resources during the execution of instructions.
- Introduce the design of basic I/O hardware and microprocessor interfacing: memory chip selection, memory expansion, I/O interfacing, different I/O techniques.

List of Experiments:

1. Blink an LED with software delay, delay generated using the SysTick timer.
2. System clock real time alteration using the PLL modules.
3. Control intensity of an LED using PWM implemented in software and hardware.
4. Control an LED using switch by polling method, by interrupt method and flash the LED once every five switch presses.
5. UART Echo Test.
6. Take analog readings on rotation of rotary potentiometer connected to an ADC channel.
7. Temperature indication on an RGB LED.
8. Mimic light intensity sensed by the light sensor by varying the blinking rate of an LED.



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(AUTONOMOUS)**

2015522: SYSTEM DESIGN WITH EMBEDDED LINUX LAB

I Year M.Tech. (ES) I – Sem.

**L T P C
0 0 3 2**

Course Objectives:

- Characteristics and challenges of embedded system.
- Demonstrate the Interfacing SSD and LCD with 8051.
- To make the student learn fundamentals of Operating Systems.
- To understand the embedded Linux development model.
- To be able to write and debug applications and drivers in embedded Linux.

Course Outcomes:

At the end of this course, students will be able to

- Explain Assembly Language Programming Process and Tools.
- Demonstrate program for serial communication in 8051 at desired baud rate.
- Understand the fundamentals of interaction of OS with a computer and User computation.
- Demonstrate the fundamental concepts of how process are created and controlled with OS.
- Demonstrate Describe the programming logic of modeling Process based on range of OS features.

List of Experiments:

1. Write a Program to
 - a) Read inputs from switches.
 - b) To make LEDs blink.
2. Write a program to interface a switch and a buzzer to two different pins of a Port such that the buzzer should sound as long as the switch is pressed.
3. Write a Program for serial communication.
4. Write a Program for encryption / decryption.
5. Develop necessary interfacing circuit to read data from a sensor and process using the 8051 boards. The data to be displayed on a PC monitor.
6. Write a program to transmit a message from Microcontroller to PC serially using RS232
7. Sort RTOs on to 89CS1 board and Verify.
8. Simulate on elevator movement using RTO's on 89CS1 board.



**MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AUTONOMOUS)**

**2015502: RESEARCH METHODOLOGY & IPR
(Mandatory Course-I)**

I Year M.Tech. (ES) I – Sem.

L T P C

2 0 0 2

Prerequisite: Nil

Course Objectives:

- To understand the research problem
- To know the literature studies, plagiarism and ethics
- To get the knowledge about technical writing
- To analyze the nature of intellectual property rights and new developments
- To know the patent rights

Course Outcomes:

At the end of this course, students will be able to

- Illustrate research problem formulation
- Analyze research related information and research ethics
- Summarize the present day scenario controlled and monitored by Computer and Information Technology, where the future world will be ruled by dynamic ideas, concept, creativity and innovation
- Explain how IPR would take such an important place in growth of individuals & nation, to summarize the need of information about Intellectual Property Right to be promoted among student community in general & engineering in particular
- Relate that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about economic growth and social benefits

UNIT - I

Research Methodology: An Introduction, Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations.

Learning outcomes: At the end of this unit, the student will be able to

- Explain the scope and objectives of a research problem
- List out criteria and characteristics of a good research problem
- Summarize the approaches of investigation of solutions for a research problem

UNIT - II

Literature Survey and Ethics:

Effective literature studies approaches, analysis, Plagiarism, Research ethics

Learning outcomes: At the end of this unit, the student will be able to

- Outline the Literature study approaches
- Adapt Research ethics in professional life
- Explain legal compliances of Plagiarism



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UNIT - III**Interpretation and Report Writing:**

Effective technical writing, how to write report, Paper Developing a Research Proposal, Format of research proposal, a presentation and assessment by a review committee.

Learning outcomes: At the end of this unit, the student will be able to

- Demonstrate technical report writing
- Develop research paper writing skills
- Develop Power Point Presentation skills

UNIT - IV**Intellectual Property Rights and Patents:**

Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.

Learning outcomes: At the end of this unit, the student will be able to

- Explain Intellectual Property Rights and differentiate among Patents, Designs, Trade Marks and Copyrights
- Outline the process of patenting and development
- Explain the procedure for granting patent

UNIT - V**Intellectual Patent Rights and Developments:**

Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications. New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs.

Learning outcomes: At the end of this unit, the student will be able to

- Explain patent right and its scope
- Make use of patent information and databases
- Discover the new developments in IPR

TEXT BOOKS:

1. C.R. Kothari, Research Methodology, 3rd edition, New Age International, 2017.
2. Ranjit Kumar, Research Methodology – A Step by Step for Beginner's, 2nd edition, Pearson, Education, 2016.

REFERENCES:

1. T. Ramappa, Intellectual Property Rights Under WTO, 2nd edition, S Chand, 2015
2. Kompal Bansal., Par shit Bansal, Fundamentals of IPR for Beginner's, 1st edition, BS Publications, 2016.
3. Mark Saunders., Philip Levis., Adrain Thornbill, Research Methods for Business Students, 3rd edition (Reprint), Pearson Education, 2013.



**MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AUTONOMOUS)**

**2015528: ENGLISH FOR RESEARCH PAPER WRITING AND ITS
SIGNIFICANCE
(Audit Course – I & II)**

L T P C

2 0 0 0

Pre-requisite: Nil

Course Objectives:

- Understand that how to improve your writing skills and level of readability
- Learn about what to write in each section
- Understand the skills needed when writing a Title Ensure the good quality of paper at very first-time submission
- Introduce you to the research process through writing about literature
- You will learn more about what makes an effective university-level essay and will know some strategies that can improve your papers in content, organization, word choice, grammar, and mechanics

Course Outcomes:

At the end of this course, the student will be able to:

- Taking care of UK and USA English words while writing a research paper
- Understand structuring Paragraphs and Sentences for writing the paper
- What are the skills needed when writing the Sections of a paper, abstracts and introduction?
- Skills needed when writing the results and discussions, the references and their citations
- Understand plagiarism, and how to quote from another paper by paraphrasing with examples

UNIT – I

Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness

Learning Outcomes: At the end of the unit, the student will be able to:

- Taking care of UK and USA English words while writing a research paper
- Understand structuring Paragraphs and Sentences for writing the paper
- Identify Ambiguity and Vagueness for avoiding

UNIT – II

Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticizing, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts. Introduction

Learning Outcomes: At the end of the unit, the student will be able to:

- What are the skills needed when writing the Sections of a paper, abstracts and introduction?
- Understand plagiarism and how to quote from another paper by paraphrasing with examples
- Understand the how to write contributions

UNIT – III

Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check.

Learning Outcomes: At the end of the unit, the student will be able to:

- What are the skills needed when writing the results and discussions?
- How to ensure paper is as good as it could possibly be the first- time submission
- Analyze different types of methods for writing a paper



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UNIT – IV

Key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature.

Learning Outcomes: At the end of the unit, the student will be able to:

- What are the skills needed when writing the title, abstract and introductions?
- Skills required for analyzing various research papers for writing literature
- How to ensure paper is as good as it could possibly be the first- time submission

UNIT – V

Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions. useful phrases, how to ensure paper is as good as it could possibly be the first- time submission

Learning Outcomes: At the end of the unit, the student will be able to:

- What are the skills needed for applying various methods while writing?
- Skills needed when writing the results and discussions
- Skills needed when writing the references and their citations

Text Books:

1. R. Goldbort R, "Writing for science," Yale University Press, First edition 2006.
2. R. Day, "How to write and publish a scientific paper," Cambridge University Press, First edition, 2006.

Reference Books:

1. N. Highman, "Handbook of writing for the mathematical sciences," Society of industrial and applied mathematics (SIAM), Second edition, 1998.
2. Adrian Wallwork, "English for writing research papers," Springer New York Dordrecht Heidelberg London, Second edition, 2011.
3. Kate L. Turabian, "A manual for writers of research papers, theses, and dissertations," University of Chicago Press, Ninth Edition, 2018.



**MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AUTONOMOUS)**

**2015529: DISASTER MANAGEMENT
(Audit Course – I & II)**

L T P C

2 0 0 0

Pre-requisite: Nil

Course Objectives:

- To learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response
- To critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives
- To develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations
- To critically understand the strengths and weaknesses of disaster management approaches
- To analyze planning and programming in different countries, particularly their home country or the countries they working

Course Outcomes:

At the end of this course, the student will be able to

- Able to Understand Definitions and Terminologies used in Disaster Management
- Able to promote Prevention and Preparedness for disaster
- Able to Understanding Disasters, man-made Hazards and Vulnerabilities
- Able to Understanding capacity building concepts and planning of disaster managements
- Able to know about disaster management mechanism

UNIT – I

Introduction:

Disaster: Definition, Factors and Significance; Difference Between Hazard and Disaster; Natural and Manmade Disasters: Difference, Nature, Types and Magnitude.

Disaster Prone Areas in India: Study of Seismic Zones; Areas Prone to Floods and Droughts, Landslides and Avalanches; Areas Prone to Cyclonic and Coastal Hazards with Special Reference to Tsunami; Post-Disaster Diseases and Epidemics.

Learning Outcomes: At the end of the unit, the student will be able to

- Understand the definition of disaster and its factors and significance
- Conclude the difference between hazard and disaster
- Analyze the different types of disasters

UNIT – II

Repercussions of Disasters and Hazards:

Economic Damage, Loss of Human and Animal Life, Destruction of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts and Famines, Landslides and Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks and Spills, Outbreaks of Disease and Epidemics, War and Conflicts.

Learning Outcomes: At the end of the unit, the student will be able to

- Acquire knowledge on economic damage and destruction of ecosystem
- Understand the effects of natural disasters like earthquakes, volcanisms, cyclones etc.,
- Analyze the repercussions of manmade disasters in industries ,war and conflicts



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(AUTONOMOUS)

UNIT – III**Disaster Preparedness and Management:**

Preparedness: Monitoring of Phenomena Triggering A Disaster or Hazard; Evaluation of Risk: Application of Remote Sensing, Data from Meteorological and Other Agencies, Media Reports: Governmental and Community Preparedness.

Learning Outcomes: At the end of the unit, the student will be able to

- Understand the concept of triggering
- Realize the applications of remote sensing and evaluation of Risk
- Identify the difference between governmental preparedness and community preparedness

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.

Learning Outcomes: At the end of the unit, the student will be able to:

- Explain the elements and concept of reducing disaster risk
- Understand the techniques of risk assessment and risk situation in global and national disasters
- Study the strategies for survival and participation of people in risk assessment

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

Learning Outcomes: At the end of the unit, the student will be able to

- Understand the concept of Disaster Mitigation
- Analyze the emerging trends in Mitigation and types of mitigations
- Explain the programs of Disaster Mitigation in India

Text Books:

1. R. Nishith, Singh AK, "Disaster Management in India: Perspectives, issues and Strategies" New Royal book Company.
2. Sahni, Pardeep et. al. (Eds.), "Disaster Mitigation Experiences and Reflections", Prentice Hall of India, New Delhi.

Reference Books:

1. Goel S. L., Disaster Administration and Management Text and Case Studies", Deep & Deep Publication Pvt. Ltd., New Delhi.
2. R. B. Singh, "Natural Hazards and Disaster Management", 1st Edition, Rawat Publication, 2006.
3. Subir Ghosh, "Natural Disaster Management: New Technologies and Opportunities", First edition, ICFAI University Press, 2012.



**MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AUTONOMOUS)**

**2015530: SANSKRIT FOR TECHNICAL KNOWLEDGE
(Audit Course – I & II)**

**L T P C
2 0 0 0**

Prerequisite: Nil

Course Objectives:

- To get a working knowledge in illustrious Sanskrit, the scientific language in the world
- Learning of Sanskrit to improve brain functioning
- Learning of Sanskrit to develop the logic in mathematics, science & other subjects enhancing the memory power
- The engineering scholars equipped with Sanskrit will be able to explore the huge knowledge from ancient
- literature Basic communication skills in understanding Sanskrit with LSRW (Listening, Speaking, Reading & Writing) capacities

Course Outcomes:

At the end of this course, the student will be able to

- Understanding basic Sanskrit language
- Ancient Sanskrit literature about science & technology can be understood
- Being a logical language will help to develop logic in students
- Usage of critical thinking while correlating concepts with personal experiences
- Usage of Shastric discipline and ancient traditional learning while discriminating others

UNIT-I

Alphabets in Sanskrit

Learning Outcomes: At the end of the unit, the student will be able to

- Pronounce all 49 sounds of the Sanskrit alphabet
- Vowels and vowel diacritics (Ghosa)
- Consonants (vyajjana) , conjuncts(Sanyoga) & Nu,merals (Sankhya)

UNIT-II

Past/Present/Future Tense, Simple Sentences

Learning Outcomes: At the end of the unit, the student will be able to

- Use present, past, and future tenses with appropriate time markers
- Identify the verb and tense in a sentence by circling and labeling
- Write a sentence using the past, present, or future tense

UNIT-III

Order, Introduction of roots

Learning Outcomes: At the end of the unit, the student will be able to:

- Learn new words
- Form new sentences
- Gain mastery of communication skills eventually



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UNIT-IV

Technical information about Sanskrit Literature

Learning Outcomes: At the end of the unit, the student will be able to

- Morally and ethically well cultured students contributing to creating a better society
- Cultivating self realization, realizing the inner peace, thinking out of this material realm of things.
- Utilize the knowledge to tackle the hurdles in this journey of life

UNIT-V

Technical concepts of Engineering-Electrical, Mechanical, Architecture, Mathematics

Learning Outcomes: At the end of the unit, the student will be able to

- Develop critical thinking to face challenges in life or academics
- Learn, plan and conduct small-scale survey studies and analyze the data in order to postulate research problems.
- To be citizens not after rat race but with interest of uplifting society with ethics and morals

TEXT BOOKS:

1. Dr. Vishwas, Samskrita, "Abhyas pustakam," Bharti Publication, New Delhi.
2. Prathama Deeksha and Vempati Kutumbshastri, "Teach Yourself Sanskrit," Rastriya Sanskrit Santhanam, New Delhi.

REFERENCE BOOKS:

1. Dr. Vishwas, Samskrita, "Abhyas pustakam," Bharti Publication, New Delhi.
2. Prathama Deeksha and Vempati Kutumbshastri, "Teach Yourself Sanskrit," Rastriya Sanskrit Santhanam, New Delhi.
3. Suresh Soni, "India's Glorious Scientific Tradition," Ocean book s (P) Ltd., New Delhi.



**MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AUTONOMOUS)**

**2015531: VALUE EDUCATION
(Audit Course – I & II)**

**L T P C
2 0 0 0**

Prerequisite: Nil

Course Objectives:

- Understand value of education and self- development
- Imbibe good values in students
- Let the should know about the importance of character
- To teach the philosophy of Life, personal value, social value, mind cultural value and personal health
- To teach professional ethical values, codes of ethics, responsibilities, safety, rights and related global issues.

Course outcomes:

At the end of this course, the student will be able to:

- Knowledge of self-development
- Learn the importance of Human values
- Developing the overall personality
- To learn about philosophy of Life and Individual qualities
- To learn and practice social values and responsibilities

UNIT-I

Values and self-development –Social values and individual attitudes. Work ethics, Indian vision of humanism. Moral and non- moral valuation. Standards and principles. Value judgments

Learning Outcomes: At the end of the unit, the student will be able to:

- To learn and practice mind culture, forces acting on the body and causes of diseases and their curing
- Discuss on specific issues related to curriculum & assessment at elementary level of education.
- Understand Concept of quality and excellence in education, it's relation to quality of life and its role of educational transformation in national development

UNIT-II

Importance of cultivation of values. Sense of duty. Devotion, Self-reliance. Confidence, Concentration. Truthfulness, Cleanliness. Honesty, Humanity. Power of faith, National Unity. Patriotism. Love for nature, Discipline.

Learning Outcomes: At the end of the unit, the student will be able to

- To learn more of Engineer as Responsible Experimenter
- Understand current practices, current Status, Recent Initiatives and future prospects of Elementary Education in India
- Critically study implementation of the RTE Act or other issues influencing Elementary Education in India

UNIT-III

Personality and Behavior Development - Soul and Scientific attitude. Positive Thinking. Integrity and discipline, Punctuality, Love and Kindness.



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Learning Outcomes: At the end of the unit, the student will be able to

- To learn more of Risk and Safety assessment with case studies
- Execute innovative methodologies in teaching
- Practice various teaching skills in peer group

UNIT-IV

Avoid fault Thinking. Free from anger, Dignity of labour. Universal brotherhood and religious tolerance. True friendship. Happiness Vs suffering, love for truth. Aware of self-destructive habits. Association and Cooperation. Doing best for saving nature.

Learning Outcomes: At the end of the unit, the student will be able to

- Apply the theoretical knowledge of teaching skills in real classroom situation
- To learn more of Responsibilities and Rights as Professional and facing Global Challenges
- Understanding of the historical and socio-economic trends of Indian society in order to be able to appreciate the interrelatedness of education with society

UNIT-V

Character and Competence –Holy books vs Blind faith. Self-management and Good health. Science of reincarnation, Equality, Nonviolence, Humility, Role of Women. All religions and same message. Mind your Mind, Self-control. Honesty, Studying effectively

Learning Outcomes: At the end of the unit, the student will be able to

- Understand the relationship between Indian condition and Education for addressing equity, quality justice and inclusion
- Understand various policies related to Elementary Education and issues related to them
- Build a robust vision of a school, community and society from a liberal, humane perspective

TEXT BOOKS:

1. Chakroborty, S.K. "Values and Ethics for organizations Theory and practice," Oxford University Press, New Delhi
2. M.G. Chitakra, "Education and Human Values," A.P.H. Publishing Corporation, New Delhi, 2003.

REFERENCES:

1. M.K. Satchidananda, "Ethics, Education, Indian Unity and Culture," Ajantha Publications, Delhi, 1991.
2. M.S. Das, & V.K. Gupta, "Social Values among Young adults: A changing Scenario," M.D. Publications, New Delhi, 1995.
3. S.P. Ruhela, "Human Values and education, Sterling Publications," New Delhi, 1986.



**MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AUTONOMOUS)**

**2025532: CONSTITUTION OF INDIA IN PRACTICE
(Audit Course – I & II)**

**L T P C
2 0 0 0**

Prerequisite: Nil

Course Objectives:

- Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
- Address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism.
- Address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.
- Acquaint students with latest intellectual property rights and innovation environment with related regulatory framework.
- Make students learn about role of engineering in business organizations and e-governance.

Course Outcomes:

At the end of this course, the student will be able to

- Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics
- Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India
- Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution
- Discuss the passage of the Hindu Code Bill of 1956
- Discover and apply different laws and regulations related to engineering practices

UNIT-I

History of Making of the Indian Constitution: History Drafting Committee, (Composition & Working),
Philosophy of the Indian Constitution: Preamble, Salient Features.

Learning Outcomes: At the end of this unit, the students will be able to

- Discuss meaning and importance of Constitution.
- Describe Making of Indian Constitution
- Demonstrate Salient features of Indian Constitution

UNIT-II

Contours of Constitutional Rights & Duties: Fundamental Rights Right to Equality, Right to Freedom, Right against Exploitation, Right to Freedom of Religion, Cultural and Educational Rights, Right to Constitutional Remedies, Directive Principles of State Policy, Fundamental Duties.

Learning Outcomes: At the end of this unit, the students will be able to

- Define Fundamental Rights
- Illustrate Fundamental Duties
- Analyze Directive Principles

UNIT-III

Organs of Governance: Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers, Judiciary, Appointment and Transfer of Judges, Qualification, Powers and Functions.



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Learning Outcomes: At the end of this unit, the students will be able to

- Discuss President of India – Election and Powers
- Examine Prime Minister and Council of Ministers
- Describe Lok Sabha – Composition and Powers

UNIT-IV

Local Administration: District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation. Panchayati raj: Introduction, PRI: Zila Panchayat. Elected officials and their roles, CEO Zila Panchayat: Position and role. Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy.

Learning Outcomes: At the end of this unit, the students will be able to

- Discuss Governor – Powers
- Describe Chief Minister and Council of Ministers
- Illustrate Legislative Assembly – Composition and powers.

UNIT-V

Election Commission: Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners. State Election Commission: Role and Functioning. Institute and Bodies for the welfare of SC/ST/OBC and women.

Learning Outcomes: At the end of this unit, the students will be able to

- Understand Features of Election commission system in India
- Demonstrate state election commission
- Develop Institute and bodies for SC/ST/OBC

TEXT BOOKS:

1. The Constitution of India, 1950 (Bare Act), Government Publication.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.

REFERENCES:

1. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
2. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.
3. N. Chandhoke & Priyadarshini (eds), "Contemporary India: conomy, Society, Politics," New Delhi: Oxford University Press, 2009



**MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
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**2025533: PEDAGOGY STUDIES
(Audit Course – I & II)**

**L T P C
2 0 0 0**

Pre-requisite: Nil

Course Objectives:

- Review existing evidence on the review topic to inform programme design and policy making undertaken by the DfID, other agencies and researchers
- Identify critical evidence gaps to guide the development
- Identify teacher education (curriculum and practicum) and the school curriculum and guidance materials best support for effective pedagogy
- Disseminate how research findings within a country are not always well known or understood
- Resources and large class sizes, Teachers attitudes and beliefs and pedagogic strategies

Course Outcomes:

At the end of this course, the student will be able to

- What is meant by pedagogy and policy background? aims of pedagogy
- What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
- What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
- How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?
- Various pedagogic strategies

UNIT – I

Introduction and Methodology: Aims and rationale, Policy background, Conceptual framework and terminology Theories of learning, Curriculum, Teacher education. Conceptual framework, Research questions. Overview of methodology and Searching.

Learning Outcomes: At the end of the unit, the student will be able to:

- Analyze different types of Policy background, Conceptual framework and terminology Theories of learning
- Understand curriculum and teacher education
- Identify Research questions and research gaps

UNIT – II

Thematic overview: Pedagogical practices are being used by teachers in formal and informal classrooms in developing countries. Curriculum, Teacher education.

Learning Outcomes: At the end of the unit, the student will be able to

- What are the curriculum materials and policy background?
- What is the evidence on the effectiveness of pedagogical practices, in what conditions, and with what population of learners?
- What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?



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UNIT – III

Evidence on the effectiveness of pedagogical practices, Methodology for the indepth stage: quality assessment of included studies. How can teacher education (curriculum and practicum) and the scho curriculum and guidance materials best support effective pedagogy? Theory of change. Strength and nature of the body of evidence for effective pedagogical practices. Pedagogic theory and pedagogical approaches. Teachers' attitudes and beliefs and Pedagogic strategies.

Learning Outcomes: At the end of the unit, the student will be able to

- What is the evidence on the effectiveness of pedagogical practices, in what conditions, and with what population of learners?
- Strength and nature of the body of evidence for effective pedagogical practices
- Identify the Methodology for the in-depth stage: quality assessment of included studies

UNIT – IV

Professional development: alignment with classroom practices and follow-up support, Peer support, Support from the head teacher and the community. Curriculum and assessment, Barriers to learning: limited resources and large class sizes

Learning Outcomes: At the end of the unit, the student will be able to:

- How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?
- Analyze and critique the theories of learning that underpin the different pedagogical approaches.
- What are the limited resources and large class sizes for barriers to learning?

UNIT – V

Research gaps and future directions: Research design, Contexts, Pedagogy, Teacher education, Curriculum and assessment, Dissemination and research impact.

Learning Outcomes: At the end of the unit, the student will be able to:

- Discuss research gaps identified and future research priorities
- Write a short note on dissemination and research impact.
- Explain the Research design and Peer support

Text Books:

3. J. Ackers AND F. Hardman, "Classroom interaction in Kenyan primary schools Compare," vol. 31, no. 2 pp. 245-261, Nov. 2009.
4. M. Agrawal, "Curricular reform in schools: The importance of evaluation," Journal of Curriculum Studies, vol .36, no. 3, pp. 361-379, Dec. 2004.

Reference Books:

4. K. Akyeampong, "Teacher training in Ghana - does it count? Multi-site teacher education research project (MUSTER) country report 1," London: DFID, 2003.
5. K. Akyeampong, k. Lussier, J. Pryor and J. Westbrook Improving teaching and learning of basic maths and reading in Africa: Does teacher preparation count? ,” International Journal Educational Development, vol .33, no. 3, pp. 272–282. July 2013.
6. R.J. Alexander, "Culture and pedagogy: International comparisons in primary education," Oxford and Boston, Blackwell. 2001.



**MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AUTONOMOUS)**

**2025534: STRESS MANAGEMENT BY YOGA
(Audit Course – I & II)**

L T P C
2 0 0 0

Pre-requisite: Nil

Course Objectives:

- To achieve overall health of body and mind
- To overcome stress
- To improve the physical conditioning related to flexibility through participation in Hatha yoga.
- Develop and maintain a personal yoga practice.
- Recognize and apply the value and benefits of an on-going yoga practice

Course Outcomes:

At the end of this course, the student will be able to

- Develop healthy mind in a healthy body thus improving social health also
- Improve efficiency
- Use practical tools for stress management in educational environments
- Improve their emotional intelligence to better deal with stress
- Understand the best relaxation techniques for educators and students

UNIT – I

Definitions of Eight parts of yog. (Ashtanga)

Learning Outcomes: At the end of the unit, the student will be able to:

- To learn Traditional Indian Yoga systems
- To understand The philosophy of the Yoga systems
- To learn new thought in Yoga movement in the country

UNIT – II

Yam and Niyam.

Learning Outcomes: At the end of the unit, the student will be able to:

- To introduce the essential elements of a yogic life style
- Will gain in-depth understanding of fundamental and applied scientific concepts and methods of Yogic Science and allied Science
- yoga sciences & Holistic Health can find a career to teach and spread the knowledge in schools, colleges, health centers

UNIT – III

Do`s and Don`t`s in life.

- i. Ahinsa, satya, astheya, bramhacharya and aparigraha
- ii. Shaucha, santosh, tapa, swadhyay, ishwarpranidhan

Learning Outcomes: At the end of the unit, the student will be able to:

- To introduce a regular and rigorous practice (sadhana) of yoga practices
- Learn the Yogasanas and be able to guide others in practice
- The procedures of executing Bandha and Mudra



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UNIT – IV

Asan and Pranayam

Learning Outcomes: At the end of the unit, the student will be able to:

- Learn the procedures of Pranayama and be able to execute these
- The Meditation and be able to guide others in practice
- Explain the basics of Samkhya and Yoga darshanas (Philosophies)

UNIT – V

- i. Various yog poses and their benefits for mind & body
- ii. Regularization of breathing techniques and its effects-Types of pranayam

Learning Outcomes: At the end of the unit, the student will be able to:

- To give a basic understanding of the human anatomy
- To give a deeper understanding of the human systems
- To learn the mechanism of changes in body due to Yoga practice

Text Books:

1. 'Yogic Asanas for Group Training-Part-I': Janardan Swami Yogabhyasi Mandal, Nagpur
2. "Rajayoga or conquering the Internal Nature" by Swami Vivekananda, Advaita Ashrama (Publication Department), Kolkata

Reference Books:

1. Rajayoga - Swami Vivekananda - Ramakrishna Ashrama Publications.
2. The Science of Yoga - Taimini - Theosophical Publishing House, Adyar, Madras.
3. Patanjali Yoga Pradeepa Omananda Tirtha- Geeta Press, Gorakhpur.



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**2025535: PERSONALITY DEVELOPMENT THROUGH LIFE
ENLIGHTENMENT SKILLS
(Audit Course - I & II)**

L T P C

2 0 0 0

Prerequisite: None

Course Objectives:

- To learn to achieve the highest goal happily
- To become a person with stable mind, pleasing personality and determination
- To awaken wisdom in students
- To manage competency- mix at all levels for achieving excellence with ethics

Course Outcomes: Students will be able to

- Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life
- The person who has studied Geeta will lead the nation and mankind to peace and prosperity
- Study of Neetishatakam will help in developing versatile personality of students.
- Understand the importance of empathetic listening

UNIT-I:

Neetisatakam-Holistic development of personality

- Verses- 19,20,21,22 (wisdom)
- Verses- 29,31,32 (pride & heroism)
- Verses- 26,28,63,65 (virtue)

UNIT-II:

Neetisatakam-Holistic development of personality

- Verses- 52,53,59 (dont's)
- Verses- 71,73,75,78 (do's)

UNIT-III:

Approach to day to day work and duties.

- Shrimad Bhagwad Geeta: Chapter 2-Verses 41, 47,48,
- Chapter 3-Verses 13, 21, 27, 35, Chapter 6-Verses 5,13,17, 23, 35,
- Chapter 18-Verses 45, 46, 48.

UNIT-IV:

Statements of basic knowledge.

- Shrimad Bhagwad Geeta: Chapter2-Verses 56, 62, 68
- Chapter 12 -Verses 13, 14, 15, 16,17, 18
- Personality of Role model. Shrimad Bhagwad Geeta

UNIT-V:

- Chapter2-Verses 17, Chapter 3-Verses 36,37,42,
- Chapter 4-Verses 18, 38,39
- Chapter18 – Verses 37,38,63



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TEXT BOOKS:

1. "Srimad Bhagavad Gita" by Swami Swarupananda Advaita Ashram (Publication Department), Kolkata.
2. Bhartrihari's Three Satakam (Niti-sringar-vairagya) by P.Gopinath, Rashtriya Sanskrit Sansthanam, New Delhi.
3. Personality Development and Career management: By R.M.Onkar (S Chand Publications).