

**CSE 300 PR1: Linux Laboratory**

**Course Objectives**

- To apply the knowledge of mathematics, basic science and engineering solving the real-world computing problems to succeed higher education and professional careers.
- To develop the skills required to comprehend, analyze, design and create innovative computing products and solutions for real life problems.
- To inculcate professional and ethical attitude, communication and teamwork skills, multi-disciplinary approach and an ability to relate computer engineering issues with social awareness.

**Course Outcomes (COs):** Upon completion of this unit students will be able to:

1. Understand the basic knowledge of Linux commands and file handling utilities by using Linux shell environment.
2. Evaluate the concept of shell scripting programs by using an AWK and SED commands.
3. Create the directory, how to change and remove the directory.
4. Analyze the process of how the parent and child relationships
5. Understand the IPC mechanism.

**Articulation Matrix**

*(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)*

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	2	1	-	1	-	1	-	-	-	-	-	-	-	-
CO3	1	3	2	1	1	1	1	-	-	-	-	1	2	1	1
CO4	2	2	3	2	2	1	2	1	-	-	-	1	2	1	1
CO5	3	2	1	1	1	2	1	-	-	-	-	1	2	-	1

High-3 Medium-2 Low-1

**List of Practical(s)**

- 1.To Install Ubuntu Linux and LINUX Commands(File Handling utilities, Text processing utilities, Network utilities, Disk utilities, Backup utilities and Filters).
2. Write a Shell Script that accepts a file name, starting and ending line numbers as arguments and displays all lines between the given line numbers.
3. Write a shell script that deletes all lines containing the specified word in one or more files supplied as arguments to it.
4. Write a shell script that displays a list of all files in the current directory to which the user has read, write and execute permissions.
5. Write a program using get and post method in Servlet.
15. Write a program using get and post method in Servlet.
5. Write a shell script that receives any number of file names as arguments checks if every argument supplied

- is a file or directory and reports accordingly. Whenever the arguments a file it reports no of lines present in it
6. Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
  7. Write a shell script to list all of the directory files in a directory.
  8. Write a shell script to find factorial of a given number.
  9. Write an awk script to count number of lines in a file that does not contain vowels.
  10. Write an awk script to find the no of characters, words and lines in a file
  11. Implement in c language the following UNIX commands using system calls
    - a) Cat
    - b) ls
    - c) mv 39-42
  12. Write a C program that takes one or more file/directory names as command line input and reports following information
    - a) File Type
    - b) Number Of Links
    - c) Time of last Access
    - d) Read, write and execute permissions
  13. Write a C program to list every file in directory, its anode number and file name
  14. Write a C program to create child process and allow parent process to display "Parent "and the child to display "child" on the screen
  15. Write a C program that illustrate communication between two unrelated processes using named pipes

**Total: 60Hours**

**Reference(s):**

1. Venkatesh Murthy, "Introduction to Unix &Shell", Pearson Edu
2. Forouzan, "Unix &Shell Programming", Cengage Learning
3. Sumitab Das,"Unix Concept & Application",TMH
4. Gopalan, Shivaselvan,"Beginners Guide to Unix " PHI Learning

**List of e-Learning Resources:**

1. <https://www.rgpvnotes.in/btech/grading-system-old/qp/2019/07/lab-linux-cs-505>

**Subject Tr.                  Academic Coordinator                  HoD                  Sr. Faculty Nominated by DOAA**

**Mandsaur University**  
**Bachelor of Technology (Computer Science and Engineering)**  
**Semester-V<sup>th</sup>**



L-2T-1P-0C-3

**CSE190 TR1 - Computer Networks**

**Course Objectives**

- To describe the simple file transfer between two systems by opening socket connection to out server on one system and sending a file from one system to another.
- To get familiarized with the basic protocols of computer networks.
- To describe the technical issues related to the local Area Networks
- To understand Network layer design issues, various routing algorithms and congestion control algorithms.
- An understanding of computer networking theory, including principles embodied in the protocols designed for the application layer, transport layer, network layer, and link layer of a networking stack.

**Course Outcomes (COs):** Upon completion of this unit students will be able to:

1. Understand the different components in a Communication System and their respective roles.
2. Understand the fundamental concepts on data communication and the design of computer networks.
3. Analyze network devices and layer protocols to synthesize effective network designs
4. Understand TCP/UDP protocols, process-to-process delivery, congestion management, and Quality of Service principles.
5. Analyze the hierarchical structure and distribution of the domain name space within the Application Layer

**Articulation Matrix**

*(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)*

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CO2	3	2	1	-	-	-	1	-	1	-	-	2	-	2	1
CO3	2	3	2	1	-	-	1	-	-	2	-	1	-	2	1
CO4	1	3	2	1	1	1	2	-	-	-	-	2	2	1	2
CO5	3	2	1	1	-	1	1	-	-	-	-	1	2	2	1

High-3 Medium-2 Low-1

**UNIT I: Introduction to Network**

**9 Hours**

Definition, Applications, line configuration, Network topologies, Transmission mode, Types of Networks (LAN, WAN, MAN), Protocols, Network models: The OSI model, TCP/IP Protocol Suite. Physical Layer: Signals –Analog signals, Digital signals, Transmission media - Guided & Un- Guided.

**UNIT II: Network LAN Technologies**

**9 Hours**

Network LAN Technologies: Ethernet, Fast Ethernet, Gigabit Ethernet, and Wireless LAN's Data Link Layer: Error Detection and correction - Types of Errors, Error Detection, Error correction. Data link Protocols – Stop-and-wait ARQ, Go-back-n ARQ, Automatic Repeat Request (ARQ).

**UNIT III: Network Devices:****9 Hours**

Network Devices: Modem, Hub, Switch, Router, Repeaters, bridges, Gateway Network Layer: Internetwork Protocol (IP), Addressing (Classes, Dotted-decimal notation, Sample Internet), Subnet mask, Network layer Protocols – ARP, IPv4, and IPv6.

**UNIT IV: Transport Layer****9 Hours**

Transport Layer: TCP protocol, UDP protocol, Process-to-Process delivery, Congestion: Congestion control, congestion avoidance, congestion discarding, Quality of Service (QOS).

**UNIT V: Application Layer****9 Hours**

Application Layer: Domain Name System (DNS) - domain name space, distribution of name space, DNS in the Internet, SMTP, SNMP, FTP, POP3, HTTP, WWW.

**Total: 45 Hours****References**

1. Kurose and Ross, Computer Networking- A Top-Down approach, 6th edition, Pearson Education, 2017
2. Behrouz Forouzan, Computer Networks- A Top-Down approach, McGraw Hill 2017.
3. Andrew Tanenbaum, Computer Networks (5th edition), Prentice Hall 2010
4. Fred Halsall, Addison Wesley, Computer Networking and the Internet (5th edition), 2006
5. Behrouz Forouzan, Data Communications and Networking (5th edition), McGraw Hill 2017
6. Behrouz Forouzan, TCP/IP Protocol Suite (4th edition), McGraw Hill 2009

**List of e-Learning Resources:**

1. <https://nptel.ac.in/>
2. <https://www.coursera.org/>
3. <https://www.netacad.com/courses/packet-tracer>

**Subject Tr.****Academic Coordinator****HoD****Sr. Faculty Nominated by DOAA**

**Mandsaur University**  
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**Semester- V<sup>th</sup>**



L-0 T-0 P-2 C-1

**CSE190 PR1 - Computer Networks**

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**Course Outcomes (COs):** Upon completion of this unit students will be able to:

1. Understand the different components in a Communication System and their respective roles.
2. Understand the fundamental concepts on data communication and the design of computer networks.
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CO2	3	2	1	-	-	-	1	-	1	-	-	2	-	2	1
CO3	2	3	2	1	-	-	1	-	-	2	-	1	-	2	1
CO4	1	3	2	1	1	1	2	-	-	-	-	2	2	1	2
CO5	3	2	1	1	-	1	1	-	-	-	-	1	2	2	1

High-3 Medium-2 Low-1

**Practical's**

1. Write a program for print the IP Address of a WWW.YAHOO.COM
2. Write a program for to print the IP Address of the local machine and hostname.
3. Write HTML program to implement get( ) and post( ) methods
4. Write a program for to identify the well known ports on a Remote system.
5. Write a program for to print the parts of URL.
6. Write a program for to send & receive data from datagram packet.
7. Write a program for a chat application.
8. Write a program for the simple file transfer between two systems by opening socket connection to out server on one system and sending a file from one system to another.

9. Write a program for the HTTP server.
10. Implement the concept of static routing.
11. Implement the concept of dynamic routing (RIP, OSPF, BGP).
12. Packet capture and header analysis by wire-shark (TCP,UDP,IP)

**Total: 30 Hours**

**References**

1. Kurose and Ross, Computer Networking- A Top-Down approach, 6th edition, Pearson Education, 2017
2. Behrouz Forouzan, Computer Networks- A Top-Down approach, McGraw Hill 2017.
3. Andrew Tanenbaum, Computer Networks (5th edition), Prentice Hall 2010
4. Fred Halsall, Addison Wesley, Computer Networking and the Internet (5th edition), 2006
5. Behrouz Forouzan, Data Communications and Networking (5th edition), McGraw Hill 2017
6. Behrouz Forouzan, TCP/IP Protocol Suite (4th edition), McGraw Hill 2009

**List of e-Learning Resources:**

1. <https://nptel.ac.in/>
2. <https://www.coursera.org/>
3. <https://www.netacad.com/courses/packet-tracer>

**Subject Tr.**

**Academic Coordinator**

**HoD**

**Sr. Faculty Nominated by DOAA**

# Bachelor of Technology (Computer Science and Engineering)

## Semester-V

L-2T-1P-0C-3

### CSE-310 TR1: Computer Architecture and Organization

#### Course Objectives

- To know the background of internal communication of computer.
- To have better idea on how to write assembly language programs.
- To be clear with memory management techniques, I/O communication.
- To Summarize the Instruction execution stages.
- To notice how to perform computer arithmetic operations using different types of serial communication techniques.

#### Course Outcomes (COs):-Upon completion of this unit students will be able to

1. Understand the theory and architecture of the central processing unit. architecture and functionality of central processing unit, I/O and memory organization.
2. Understand the organization, design, and programming of a simple digital computer and introduces simple register transfer language to specify various computer operations.
3. Analyze cost performance and design trade-offs in designing and constructing a computer processor including memory.
4. Apply the concepts of parallel processing, pipelining and inter-processor.
5. Analyze the design issues in terms of speed, technology, cost, performance.

#### Articulation Matrix

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CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	2	-	1	1	-	1	-	-	-	-	-	-	-	-
CO3	2	-	3	-	-	1	2	1	1	-	-	-	-	1	1
CO4	-	3	2	2	2	-	1	1	-	-	-	1	1	-	1
CO5	3	2	1	2	2	1	1	1	-	-	-	1	1	1	1

High-3 Medium-2 Low-1

#### UNIT I: Basic Structure of Computer

7Hours

Structure of Desktop Computers, CPU: General Register Organization- Memory Register, Instruction Register, Control Word, Stack Organization, Instruction Format, ALU, I/O System, bus, CPU and Memory Program Counter, Bus Structure, Register Transfer Language- Bus and Memory Transfer, addressing modes.

#### UNIT II: Control Unit Organization

11Hours

Basic Concept of Instruction, Instruction Types, Micro Instruction Formats, Fetch and Execution cycle, Hardwired control unit, Micro-programmed Control unit- microprogram sequencer Control Memory, Sequencing and Execution of Micro Instruction. Computer Arithmetic: Addition and Subtraction, Two's Complement Representation, Signed Addition and Subtraction, Multiplication and division, Booth's Algorithm, Division Operation.

#### UNIT III: Floating Point Arithmetic Operation

11Hours

Design of Arithmetic unit, Instruction set architecture, CISC Scalar Processors, RISC Scalar Processors, Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, pipeline hazards, Dynamic instruction scheduling – scoreboard and

Tomsula's algorithm, Branch handling techniques, Arithmetic Pipeline.

**UNIT IV: Multifunctional Architecture Pipelines**

**7 Hours**

Design, Static arithmetic pipeline, Multifunctional arithmetic pipelines, Flynn's Classification, System Attributes to Performance, Parallel computer models Multiprocessors and multicomputer, Multivector and SIMD Computers. Data and resource dependences, Hardware and software parallelism, Program partitioning and scheduling, Grain size and latency, Control flow, data flow and Demand driven mechanisms. Static interconnection networks, Dynamic interconnection Networks: Bus Systems, Crossbar Switch, Multistage and Combining Networks.

**UNIT V: Shared Memory model**

**9 Hours**

Main memory- RAM, ROM, Secondary Memory – Magnetic Tape, Disk, Optical Storage, Cache Memory: Cache Structure and Design, Mapping Scheme, Replacement Algorithm, Improving Cache Performance, Virtual Memory, memory management hardware, Cache coherence, Snoopy protocols, Directory based protocols, distributed memory model.

**Total: 45 Hours**

**Reference(s):**

1. Morris Mano, "Computer System Organization" 3<sup>rd</sup> ed. PHI. 2017
2. C. Hamacher, Z. Vranesic and S. Zaky, "Computer Organization" 6<sup>th</sup> ed., McGraw-Hill, 2017
3. Kai Hwang, "Advanced computer architecture", TMH. 2013 – 14.
4. William Stallings: Computer Organization & Architecture, 9th Edition, Pearson, 2015.

**List of e-Learning Resources:**

1. <https://nptel.ac.in/>
2. <https://www.coursera.org/>

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**Mandsaur University**  
**Bachelor of Technology (Computer Science and Engineering)**  
**Semester-V**

L-2 T-1 P-0 C-3

**CSE1041 TR1: Deep Learning**

**Course Objectives**

1. To learn the basics of neural networks and compare different deep learning models.
2. To Learn the Recurrent and Recursive networks in Deep Learning.
3. To learn the basics of deep reinforcement Learning models and types of Networks.
4. To Learn Deep Learning Models such as CNN, RNN, GAN.

**Course Outcomes (COs)**

6. Understand the performance of deep learning models with respect to the bias-variance tradeoff, overfitting and underfitting, estimation of test error and understand the basic concepts of deep learning.
7. Apply the main parameter such as activation function and hyperparameter of neural network and understand the concept and working of neural network.
8. Apply the basic architecture and working of convolution neural networks (CNN) with importance in Deep Learning models.
9. Analyze the concept, types and working of recurrent and recursive neural networks.
10. Evaluate the deep learning generative models and understand reinforcement learning process.

**Articulation Matrix**

CO/PO/PSO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	2	-	-	-	-	-	1	-	-	-	3	-	-
CO3	-	2	3	2	-	-	-	-	-	-	-	-	3	-	-
CO4	2	2	2	2	-	-	-	-	-	1	-	-	2	-	-
CO5	2	2	1	2	2	-	-	-	2	-	-	-	2	-	-

High-3 Medium-2 Low-1

**UNIT I: Foundations of Deep Learning****9 Hours**

Basic definition of machine learning and deep learning. Basic Terms: bias, variance, tradeoff, hyper parameters, under/over fitting regularization. Limitations of machine learning, History of deep learning, Advantage and challenges of deep learning. Learning representations from data, Understanding how deep learning works in three figures, Common Architectural Principles of Deep Network, Architecture Design, Applications of Deep learning.

**UNIT II: Introduction to Neural Networks****9 Hours**

The Biological Neuron, The Perceptron, Multilayer Feed-Forward Networks, Training Neural Networks: Backpropagation and Forward propagation **Activation Functions:** Linear, Sigmoid, Tanh, Hard Tanh, SoftMax, Rectified Linear, Loss Functions: Loss Function Notation, Loss Functions for Regression, Loss Functions for Classification, Loss Functions for Reconstruction. **Hyperparameters:** Learning Rate, Regularization, Momentum, Sparsity. Deep Feedforward Networks – Example of XOR, Hidden Units, cost functions, error backpropagation, Gradient-Based Learning.

**UNIT III: Convolution Neural Network (CNN)****9 Hours**

Introduction, CNN architecture overview, The Basic Structure of a Convolutional Network- Padding, Strides, Typical Settings, the ReLU layer, Pooling, Fully Connected Layers, The Interleaving between Layers, Local Response Normalization, Training a Convolutional Network.

**UNIT IV: Recurrent Neural Network (RNN)****9 Hours**

**Recurrent and Recursive Nets:** Unfolding Computational Graphs, Recurrent Neural Networks, Bidirectional RNNs, Encoder-Decoder Sequence-to-Sequence Architectures, Deep Recurrent Networks, Recursive Neural Networks, The Challenge of Long-Term Dependencies, Echo State Networks, Leaky Units and Other Strategies for Multiple Time Scales, The Long Short-Term Memory and Other Gated RNNs, Optimization for Long-Term Dependencies, Explicit Memory.

**UNIT V: Deep Generative Models****9 Hours**

Introduction to deep generative model, Boltzmann Machine, Deep Belief Networks, Generative adversarial network (GAN), Introduction of deep reinforcement learning, Markov Decision Process, basic framework of reinforcement learning, challenges of reinforcement learning.

**Total: 45 Hours**

**Text Books:**

1. Goodfellow, I., Bengio, Y., Courville, A, —Deep Learning, MIT Press, 2016.
2. Josh Patterson & Adam Gibson, —Deep Learning.
3. Charu Agarwal, —Neural Networks and deep learning, A textbook.
4. Nikhil Buduma, —Fundamentals of Deep Learning, SPD.
5. Francois Chollet, —Deep Learning with Python.

**Reference Books:**

1. Richard S. Sutton and Andrew G. Barto, —Reinforcement Learning: An Introduction.
2. —Deep Learning from Scratch: Building with Python from First Principles | O'Reilly by Seth Weidman.
3. Francois Duval, —Deep Learning for Beginners, Practical Guide with Python and Tensorflow.

**List of e-Learning Resources:**

3. <https://nptel.ac.in/>
4. <https://www.coursera.org/>
5. <http://csis.pace.edu/ctappert/cs855-18fall/DeepLearningPractitionersApproach.pdf>
6. [https://www.dkriesel.com/\\_media/science/neuronales-netze-en-zeta2-1-col-dkriesel.com.pdf](https://www.dkriesel.com/_media/science/neuronales-netze-en-zeta2-1-col-dkriesel.com.pdf)

**Subject Tr.            Academic Coordinator            HoD            Sr. Faculty Nominated by DOAA**

**Mandsaur University**  
**Bachelor of Technology (Computer Science and Engineering)**  
**Semester-V**

L-0 T-0 P-2 C-1

**CSE1041 PR1: Deep Learning**

**Course Objectives**

5. To learn the basics of neural networks and compare different deep learning models.
6. To Learn the Recurrent and Recursive networks in Deep Learning.
7. To learn the basics of deep reinforcement Learning models and types of Networks.
8. To Learn Deep Learning Models such as CNN, RNN, GAN.

**Course Outcomes (COs)**

11. Understand the performance of deep learning models with respect to the bias-variance tradeoff, overfitting and underfitting, estimation of test error and understand the basic concepts of deep learning.
12. Apply the main parameter such as activation function and hyperparameter of neural network and understand the concept and working of neural network.
13. Apply the basic architecture and working of convolution neural networks (CNN) with importance in Deep Learning models.
14. Analyze the concept, types and working of recurrent and recursive neural networks.
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CO3	-	2	3	2	-	-	-	-	-	-	-	-	3	-	-
CO4	2	2	2	2	-	-	-	-	-	1	-	-	2	-	-
CO5	2	2	1	2	2	-	-	-	2	-	-	-	2	-	-

High-3 Medium-2 Low-1

## PRACTICAL'S

1. Implement an application of Union, Intersection and Complement operations in Deep Learning.
2. Implement an application Program to show the working of Artificial Neural Network.
3. Implementation of different activation functions applications using train Neural Network.
4. Implementation the basic application of different Learning Rules with working model.
5. Implementation the working model Perceptron Networks. Using large data sets
6. Implementation of Pattern matching using different rules.  
Implementation the application of deep learning in healthcare.
7. Implementation the application of deep learning in business analysis.

## Text Books:

1. Goodfellow, I., Bengio, Y., Courville, A, —Deep Learning, MIT Press, 2016.
2. Josh Patterson & Adam Gibson, —Deep Learning, 2017
3. Charu Agarwal, —Neural Networks and deep learning, A textbook.
4. Nikhil Buduma, —Fundamentals of Deep Learning, SPD.
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3. Francois Duval, —Deep Learning for Beginners, Practical Guide with Python and Tensorflow.

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7. <https://nptel.ac.in/>
8. <https://www.coursera.org/>
9. <http://csis.pace.edu/ctappert/cs855-18fall/DeepLearningPractitionersApproach.pdf>
10. [https://www.dkriesel.com/\\_media/science/neuronaleetze-en-zeta2-1col-dkrieselcom.pdf](https://www.dkriesel.com/_media/science/neuronaleetze-en-zeta2-1col-dkrieselcom.pdf)

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