CSE305:COMPUTING PRACTICUM-II

L:0 T:0 P:3 Credits:2

Course Outcomes: Through this course students should be able to

CO1 :: recall Linux commands to understand the power of command line to get help, manage files from the command line

CO2 :: explain and discuss the commands for creation and manipulation of files

CO3 :: apply commands and discuss the creation of users, groups to access files with linux file system permissions

CO4 :: analyze and discuss the Linux networking concepts

CO5 :: assess the Linux process for configuring and securing OpenSSH service and managing the logs

CO6 :: analyze and explain the installation, updation and deletion of software packages

List of Practicals / Experiments:

Accessing the command line

- Accessing command line using local console
- Accessing command line using desktop
- Executing commands using bash shell

Managing Files From the Command Line

- The Linux File System Hierarchy
- Locating Files by Name
- Managing Files Using Command-Line Tools
- Matching File Names Using Path Name Expansion
- Managing Files with Shell Expansion

Getting Help in Red Hat Enterprise Linux

- Reading Documentation Using man Command
- Reading Documentation Using pinfo Command
- Reading Documentation in /usr/share/doc
- Getting Help From Red Hat

Creating, Viewing, and Editing Text Files

- Redirecting Output to a File or Program
- Editing Text Files from the Shell Prompt
- Editing Text Files with a Graphical Editor

Managing Local Linux Users and Groups

- Users and Groups
- Gaining Superuser Access
- Managing Local User Accounts.
- Managing Local Group Accounts
- Managing User Passwords

Controlling Access to Files with Linux File System Permissions

- Linux File System Permissions

- Managing File System Permissions from the Command Line
- Managing Default Permissions and File Access

Monitoring and Managing Linux Processes

- Processes
- Controlling Jobs
- Killing Processes
- Monitoring Process Activity

Controlling Services and Daemons

- Identifying Automatically Started System Processes
- Controlling System Services

Configuring and Securing OpenSSH Service

- Accessing the Remote Command Line with SSH
- Configuring SSH Key-based Authentication
- Customizing SSH Service Configuration

Analyzing and Storing Logs

- System Log Architecture
- Reviewing Sys log Files
- Reviewing systemd Journal Entries
- Preserving the systemd Journal
- Maintaining Accurate Time

Managing Red Hat Enterprise Linux Networking

- Networking Concepts
- Validating Network Configuration
- Configuring Networking with nmcli
- Editing Network Configuration Files
- Configuring Host Names and Name Resolution

Archiving and Copying Files Between Systems

- Managing Compressed tar Archives
- Copying Files Between Systems Securely
- Synchronizing Files Between Systems Securely

Installing and Updating Software Packages

- Attaching Systems to Subscriptions for Software Updates
- RPM Software Packages and Yum
- Managing Software Updates with yum
- Enabling yum Software Repositories
- Examining RPM Package Files

Accessing Linux File Systems

- Identifying File Systems and Devices
- Mounting and Unmounting File Systems
- Making Links Between Files
- Locating Files on the System

Using Virtualized Systems

- Managing a Local Virtualization Host
- Installing a New Virtual Machine

Text Books:

1. RED HAT RHSCA/RHCE 7 by SANDER VAN VUGT, PEARSON

References:

1. RHCSA/RHCE RED HAT LINUX CERTIFICATION STUDY GUIDE EXAMS EX200 & EX300 by MICHAEL JANG, MCGRAW HILL EDUCATION

CSE322:FORMAL LANGUAGES AND AUTOMATION THEORY

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: understand the fundamental concepts of Formal Languages and Automata

CO2 :: illustrate Finite Automata's for different Regular Expressions and Languages

CO3 :: compare different types of Grammars and design context free grammars for formal languages

CO4 :: construct Push Down automata and Turing Machine for formal languages

CO5 :: differentiate regular, context-free and recursively enumerable languages

CO6 :: discuss key notions of computation, computability, decidability, reducibility, and complexity through problem solving

Unit I

FINITE AUTOMATA : Definition and Description of a Finite Automaton, Deterministic and Non-deterministic Finite State Machines, Transition Systems and Properties of Transition Functions, Acceptability of a String by a Finite Automaton, The Equivalence of DFA and NDFA, Mealy and Moore Machines, Minimization of Finite Automata, Basics of Strings and Alphabets, Transition Graph and Properties of Transition Functions, Regular Languages, The Equivalence of Deterministic and Non-deterministic Finite Automata

Unit II

REGULAR EXPRESSIONS AND REGULAR SETS : Regular Expressions and Identities for Regular Expressions, Finite Automata and Regular Expressions: Transition System Containing null moves, NDFA with null moves and Regular Expressions, Conversion of Non-deterministic Systems to Deterministic Systems, Algebraic Methods using Arden's Theorem, Construction of Finite Automata Equivalent to a Regular Expression, Equivalence of Two Finite Automata and Two Regular Expressions, Closure Properties of Regular Sets, Pumping Lemma for Regular Sets and its Application, Equivalence between regular languages: Construction of Finite Automata Equivalent to a Regular Expression, Properties of Regular Languages, Non-deterministic Finite Automata with Null Moves and Regular Expressions, Myhill-Nerode Theorem

Unit III

FORMAL LANGUAGES : Derivations and the Language Generated by a Grammar, Definition of a Grammar, Chomsky Classification of Languages, Languages and their Relation, Recursive and Recursively Enumerable Sets, Languages and Automata, Chomsky hierarchy of Languages

REGULAR GRAMMARS : Regular Sets and Regular Grammars, Converting Regular Expressions to Regular Grammars, Converting Regular Grammars to Regular Expressions, Left Linear and Right Linear Regular Grammars

Unit IV

CONTEXT- FREE LANGUAGES : Ambiguity in CFG, Leftmost and rightmost derivations, Language of a CFG, Sentential forms, Applications of CFG, Pumping Lemma for CFG, Derivations Generated by a Grammar, Construction of Reduced Grammars, Elimination of null and unit productions, Normal Forms for CFG: Chomsky Normal Form

SIMPLIFICATION OF CONTEXT- FREE GRAMMARS : Construction of Reduced Grammars, Greibach Normal Form

Unit V

PUSHDOWN AUTOMATA AND PARSING : Description and Model of Pushdown Automata, Representation of PDA, Acceptance by PDA, Pushdown Automata: NDPDA and DPDA, Context free languages and PDA, Pushdown Automata and Context-Free Languages, Comparison of deterministic and non-deterministic versions, closure properties, LL (k) Grammars and its Properties, LR(k) Grammars and its Properties, PARSING: Top-Down and Bottom-Up Parsing

Unit VI

TURING MACHINES AND COMPLEXITY : Turing Machine Model, Representation of Turing Machines, Design of Turing Machines, The Model of Linear Bounded Automaton, Power of LBA, Variations of TM, Non-Deterministic Turing Machines, Halting Problem of Turing Machine, Post Correspondence Problem, Basic Concepts of Computability, Decidable and Undecidable languages, RECURSIVELY ENUMERABLE LANGUAGE, Computational Complexity: Measuring Time & Space Complexity, Power of Linear Bounded Automaton, Variations of Turing Machine, Cellular automaton

Text Books:

1. THEORY OF COMPUTER SCIENCE: AUTOMATA, LANGUAGES & COMPUTATION by K.L.P. MISHRA & N. CHANDRASEKARAN, PRENTICE HALL

References:

1. AUTOMATA, COMPUTABILITY AND COMPLEXITY: THEORY AND APPLICATIONS by ELAINE RICH, PEARSON

2. INTRODUCTION TO AUTOMATA THEORY, LANGUAGES, AND COMPUTATION by HOPCROFT, MOTWANI, ULLMAN, PEARSON

3. INTRODUCTION TO THE THEORY OF COMPUTATION by MICHAEL SIPSER, CENGAGE LEARNING

4. THEORY OF COMPUTATION: A PROBLEM SOLVING APPROACH by KAVI MAHESH, WILEY

5. INTRODUCTION TO FORMAL LANGUAGES, AUTOMATA THEORY AND COMPUTATION by KAMALA KRITHIVASAN, RAMA R., PEARSON

6. THEORY OF COMPUTATION by RAJESH K. SHUKLA, CENGAGE LEARNING

7. AN INTRODUCTION TO AUTOMATA THEORY AND FORMAL LANGUAGES. by ADESH K. PANDEY, S.K. KATARIA & SONS

8. INTRODUCTION TO THEORY OF AUTOMATA, FORMAL LANGUAGES AND COMPUTATION by SATINDER SINGH CHAHAL, GULJEET KAUR CHAHAL, A.B.S.PUBLICATION, JALANDHAR

9. AN INTRODUCTIONTO FORMAL LANGUAGES AND AUTOMATA by PETER LINZ, JONES & BARTLETT LEARNING

10. CELLULAR AUTOMATA MACHINES: A NEW ENVIRONMENT FOR MODELING by TOMMASO TOFFOLI, MIT Press

CSE332:INDUSTRY ETHICS AND LEGAL ISSUES

L:2 T:0 P:0 Credits:2

Course Outcomes: Through this course students should be able to

CO1 :: Define business ethics and the complexities of making ethical judgments

CO2 :: Identify the latest trends and issues in Information technology

CO3 :: Describe various types of funding and schemes for starting up businesses in the IT sector

CO4 :: Explain how to create a strategic business plan

CO5 :: Understand the fundamental aspects of intellectual property rights

CO6 :: Analyze various cyber laws and related semantics in order to deploy security mechanisms in the IT industry

Unit I

Ethics : Definition of ethics, Importance of integrity, Ethics in business world, improving corporate ethics, Ethical decision making, Ethics in information technology, Ethical behavior of IT professional, Supporting the ethical practices of IT users, reasons for ethical problems in business, Wealth, values, and human nature

Unit II

Companies : Introduction to IT and ITES industry (Product based, Services based), Introduction to NASSCOM, STPI, Overview on latest IT projects with global impact, Case study of an IT industry (Product based and Services based), Recent technology advancement, Current affairs related with the IT industry, Diversity in the Workforce

Unit III

Government Funding and schemes for Startup : what are Startups, Startup India benefits, Resources, bank loan for start up business, Start-up India, 10000 startups -A NASSCOM Initiative, Export promotion schemes: Software Technology Parks (STPs), Special Economic Zones (SEZ) Scheme, Laws for Startups

Unit IV

Startup in IT : Planning of startup business in IT sector-Executive summary, General company Description, Products and services, Marketing plan, Operational plan, Management and organization, Personal Financial Statement, Startup Expenses and Capitalization, Financial Plan, Appendices, Refining the Plan, Examples of Successful Start-ups

Unit V

Intellectual Properties(IP'S) : Concept of Intellectual Property, Copyright and Trademark, Different kinds of marks (brand names, logos, signatures, symbols, well known marks, certification marks and service marks, Patents, Importance of Patent Information in Business Development

Unit VI

Legal, Ethical and Professional issues in Information Security : Introduction, Law and Ethics in Information Security, Organizational Liability and the Need for Counsel, Policy Versus Law, Cyber Crime, Cyber-crime on the rise, Cyber law of India, Need for cyber law in India

References:

1. ETHICS IN INFORMATION TECHNOLOGY by GEORGE W REYNOLDS, CENGAGE LEARNING

GEN330:SCIENTIFIC RESEARCH ESSENTIALS

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: understand the research metrics such as impact factor, h-index, g-index etc.

CO2 :: represent the literature effectively along with research gap.

CO3 :: use different literature search strategies and techniques.

CO4 :: plan and conduct ethical research writing.

Unit I

Fundamentals of research : meaning of research, objectives of research, motivation of research, types of research, research and scientific methods, types of research papers, research measurement, productivity and visibility: quality indicators such as impact factors, research indexes, etc, citation indexes: h-index, g-index, i-index, etc, academic social networks: research gate, academia, ORCID, etc

Unit II

Literature search techniques and strategies : formulating research questions, identifying keywords / subject headings, basic search and boolean Search, analysis of Patent Search with illustration (examples from different technology areas)

Unit III

Literature review and reference management : introduction to literature review process, types of literature review: descriptive, systematic, state-of-the-art, etc, citation styles: definition, components, types such as APA, MLA, Chicago, Harvard, IEEE, etc, reference management tools such as Mendeley, Zotero, Endnote, RefWorks, etc

Unit IV

Intellectual property rights : origin and development of intellectual property, concept of corporeal and incorporeal property, meaning and concept of different kinds of intellectual property, TRIPS agreement, Indian copyright: definition, genesis, copyright laws etc, creative common licensing: definition, types, attributes, etc, the patent act, 1970 : patentable and non patentable inventions, patent registration process, restoration of lapsed patents, surrender and revocation of patents, infringement of patents, trade mark basics, trade secret

Unit V

Report writing and presentation : microsoft word (grammar checking, formatting of documents, incorporating references), microsoft powerpoint (creation of posters, slides for seminar/talk), microsoft excel (graph plotting), research writing: writing short communication, research paper, review paper, research proposal, dissertation, comparison of different types of research writing

Unit VI

Academic integrity : code of ethics, introduction to research misconduct, confidentiality, procedure in case of misconduct, using and acknowledging sources, features and functionalities of anti-plagiarism software, detection of plagiarism by using different online tools, agencies and organisation dealing with plagiarism issues, plagiarism policies, penalties and consequences, University Grants Commission's (UGC) policy for curbing plagiarism

References:

1. ACADEMIC WRITING: A GUIDE FOR MANAGEMENT STUDENTS AND RESEARCHERS by MONIPPALLY, MATHUKUTTY M. & PAWAR, BADRINARAYAN S., SAGE PUBLICATIONS

2. YOUR RESEARCH PROJECT: DESIGNING AND PLANNING YOUR WORK by WALLIMAN, SAGE PUBLICATIONS

3. LAW RELATING TO INTELLECTUAL PROPERTY RIGHTS by M.K BHANDARI, CENTRAL LAW PUBLICATION

4. AN INTRODUCTION TO INTELLECTUAL PROPERTY RIGHTS by J. P. MISHRA, CENTRAL LAW PUBLICATION

5. THE PRESENTATION BOOK, 2/E: HOW TO CREATE IT, SHAPE IT AND DELIVER IT! IMPROVE YOUR PRESENTATION SKILLS NOW by EMMA LEDDEN,, PHI Learning

INT217:INTRODUCTION TO DATA MANAGEMENT

L:2 T:0 P:2 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: apply the various techniques and functions over spreadsheet for getting various insights of data

CO2 :: practice the data representation methods like pivot table and power pivoting

CO3 :: determining the need of the graphical representation in the spreadsheet by using various graphs and charts

CO4 :: understand the concepts of multidimensional data and topics like OLAP, OLTP and data cube

CO5 :: study the ETL process using the SSIS tool and able to perform pre-processing for data analysis

CO6 :: describe effective data management is central to good research practice and identify the benefits of effective data management.

Unit I

Spreadsheet functions to organize data : cell reference styles, creating and working with formulas, text functions, date and time functions, lookup and reference functions, mathematical and statistical functions, information and volatile functions, logical and financial functions, formula auditing, error handling, string functions

Introduction to Microsoft Excel : UI Basics : introduction to UI basics, about excel, workbooks and worksheets, customizing excel, reference styles, number formatting, custom number formatting, conditional formatting, format as table

Unit II

Data representation and manipulation : filter, advanced filter for complex criterion, sorting and custom sorting, pivot table and pivot chart, power pivot, import data from different sources into power pivot, reducing file size in power pivoting, connect to multiple different external datasets, DAX functions

Unit III

Advanced graphing and charting : charts, combo charts, working with objects charts, dynamic charts and dynamic data source for charts print areas, views for a worksheet, various printing techniques

Data protection techniques : worksheet protection, protect specific range, workbook protection and encryption

Unit IV

Building a model : introduction to building a model, about model and assumptions, diagramming the flow with exercise, wireframing with exercise, preparing the data with exercise, linking up formulas with exercise, sensitivity analysis with exercise, case study: forecasting with a model

Unit V

Multidimensional data : ETL overview, extracting data, transformations, loading data, simple ETL processing, ETL tools, data sources and destinations, OLTP and OLAP, multidimensional data models, data cube, grouping sets in T-SQL

Unit VI

Data Processing using Tableau Prep : introduction to tableau prep, installing tableau prep, basics of data preparation, connecting to data, creating data flow, blend data sources, cross-database join, project task, tableau prep for business

List of Practicals / Experiments:

Introduction to spreadsheets

- basic terminology of excel
- spreadsheet environment
- object model of excel
- customizing excel

- reference styles
- number formatting
- custom number formatting
- conditional formatting
- format as table

ETL processing with SSIS

- SQL programming for data science
- creating SSIS projects
- data wrangling before the load
- uploading data
- handling errors during ETL
- data wrangling after the load
- testing and deploying of the project

References:

1. FUNDAMENTALS OF BUSINESS ANALYTICS by R.N. PRASAD, SEEMA ACHARYA, WILEY

2. EXCEL HACKS,2/ED TIPS & TOOLS FOR STREAMLINING YOUR SPREADSHEETS by DAVID, SHROFF/O'REILLY

PEA305:ANALYTICAL SKILLS-I

L:2 T:1 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: demonstrate procedural fluency with number system and mathematical operations to solve the stated problems.

CO2 :: select an appropriate approach to solve real life problems related to percentage, profit and loss.

CO3 :: apply the concepts learnt to solve the questions of ratio and proportion

CO4 :: use the concepts of permutation, combination and probability to handle different situation.

CO5 :: solve the reasoning aptitude problems such as blood relation, direction sense.

CO6 :: observe the data given and interpret it on the given number and alphanumeric series.

Unit I

Number system : HCF & LCM, divisibility rules, classification of numbers, factors, factorials, unit digit calculation, remainder properties

Average : basic average calculations, average increase and decrease, weighted average

A.P and G.P : basic formulas on arithmetic and geometric progressions, calculation of general terms, sum of n terms calculation

Unit II

Percentage : basic percentage calculations, percentage to fraction, percentage comparison, percentage increase and decrease, population change in percentage

Profit loss discount : basic concepts of cost price selling price and marked price, calculations of profit and loss percentage, types of discount and discount percentages, comparison of profit or loss with discount percentage

Simple and compound interest : basic concepts of interest calculations, comparison of simple and compound interest, EMI calculations

Unit III

Logical reasoning : number series, alpha series, alphabet test, coding and decoding, language coding

Unit IV

Ratio and proportions : basic concepts of ratio and proportions and ages, problems based on ratio and proportions and ages, problems based on partnerships and profit sharing

Alligation and mixtures : conceptual knowledge of alligation and mixtures, problems based on alligation and mixtures

Unit V

Permutation : basic principle of counting, numerical permutation(formation of numbers and sum of numbers), alpha permutation(rearrangement of words and rank of a word), linear and circular permutation, logical permutation

Combination : basic formulas of combination, formation of committee, combination of identical objects

Probability : concept of probability, classification of events, conditional probability, problems based on coins dices and cards

Unit VI

Analytical reasoning : Blood Relation, Direction Sense

Text Books:

1. QUANTITATIVE APTITUDE FOR COMPETITIVE EXAMINATIONS by DR.R.S. AGGARWAL, S Chand Publishing

2. A MODERN APPROACH TO VERBAL AND NON-VERBAL REASONING by DR. R.S. AGGARWAL, S Chand Publishing

References:

1. MAGICAL BOOK ON QUICKER MATHS by M.TYRA, BANKING SERVICE CHRONICLE

2. MAGICAL BOOK SERIES ANALYTICAL REASONING by M.K. PANDEY, BANKING SERVICE CHRONICLE

PEV107:VERBAL ABILITY-II

L:1 T:2 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: recall sentences to form paragraphs reflecting different patterns of organization by using distinct transition words

CO2 :: examine the elements of an effective articulation in professional conversation

CO3 :: apply the learned strategies of skimming and scanning to discover the general idea and to find specific information in a familiar text

CO4 :: analyze simple sentences containing learned vocabulary and using appropriate grammatical structures in speaking and writing

CO5 :: evaluate the different strategies to understand new vocabulary and grammatical structures in context

CO6 :: compose grammatically structured questions related to basic needs and respond appropriately using short phrases and sentences

Unit I

Sentence correction : modifiers, parallelism, subject-verb agreement, pronoun agreement, comparisons, redundancy, error of participles, verb tenses

Unit II

Voice and accent : introduction to vowels and consonants, introduction to syllable, stress and intonation

Unit III

Vocabulary enrichment : one- word substitution, Cloze test, Sentence Synonyms, Vocabulary with pictures

E-mail writing : purpose and functional role of e-mail, structural components of e-mail, do's and don'ts of e-mail writing, exercise based on e-mail writing scenarios

Unit IV

Essay writing : idea elaboration, writing an introduction, logical sequencing of ideas, generating points or supporting ideas and examples, concluding the essay

Reading comprehension passages : types of question- inference, main idea, supporting idea, assumption

Unit V

Narration : direct and indirect speech, conversion of one speech to another, key terminologies, rules of conversion, exercises based on conversion

Cover letter : key elements of cover letter, useful words and phrases for cover letter, format of cover letter, exercise based on cover letter writing scenarios

Unit VI

Critical reasoning : concepts - premise, assumption, conclusion, strengthening statement, weakening statement, types and patterns of questions, tips and tricks to understand and solve critical reasoning, indicators to identify basic concepts of critical reasoning

References:

1. COLLINS COMMON ERRORS IN ENGLISH by COLLINS DICTIONARIES, HARPERCOLLINS PUBLISHERS

2. ESSENTIALS OF ENGLISH GRAMMAR by BAUGH, L. SUE, MC GRAW HILL

3. OXFORD LIVING GRAMMAR by KEN PATERSON , MARK HARRISON , NORMAN COE, OXFORD UNIVERSITY PRESS