



TKR COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY-R17

COURSE STRUCTURE & SYLLABUS

IV YEAR I SEMESTER

S. No	Course Code	Course Title	L	T	P	Credits
1	A67PC1	Data Warehousing & Data Mining	4	0	0	3
2	A67PC2	Linux Programming	4	0	0	3
3	A67PC3	Python Programming	4	0	0	3
4		Open Elective-III	3	0	0	3
5	A67PE5	Professional Elective-IV 1. Information Security Assessments And Audits (SA-II) 2. Big Data Analytics-II 3. Human Computer Interaction	3	0	0	3
6	A67PE6	Professional Elective-V 1. Semantic Web & Social Networks 2. Cloud Computing 3. Distributed Databases	3	0	0	3
3	A67PE7	Professional Elective-VI 1. Software Process And Project Management 2. Artificial Intelligence 3. E-Commerce	3	0	0	3
7	A67PC7	Data Warehousing & Data Mining Lab	0	0	4	2
8	A67PC8	Linux Lab	0	0	4	2
9	A67PC9	Python Programming Lab	0	0	4	2
Total Credits						27

IV YEAR II SEMESTER

S.No	Course Code	Course Title	L	T	P	Credits
1	A68PE1	Professional Elective-VIII 1. Design Patterns 2. Internet Of Things 3. Advanced Computer Architecture	3	0	0	3
2	A68PE2	Professional Elective-VIII 1. Predictive Analytics 2. Information Security Incident Response And Management (SA-III) 3. Software Testing Methodologies	3	0	0	3
3		Open Elective-IV	3	0	0	3
4	A68PW4	Industry Oriented Mini Project	0	0	4	2
5	A68SE5	Seminars	0	0	4	2
6	A68CV6	Comprehensive Viva	0	0	4	2
7	A68PW7	Major Project	0	0	18	9
Total Credits						24

* Satisfactory/Unsatisfactory



**T K R COLLEGE OF ENGINEERING & TECHNOLOGY
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DEPARTMENT OF INFORMATION TECHNOLOGY R-17

DATA WAREHOUSING & DATA MINING - A67PC1

B.Tech IV Year I Semester

L/T/ P/C

4/ 0/0/3

COURSE OBJECTIVES:

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

1. Learn mathematical foundations of data mining tools.
2. Understand and implement classical models and algorithms in data warehouses and data mining.
3. Analyze the kinds of patterns that can be discovered by association rule mining, classification and clustering.
4. Apply data mining techniques in various applications like social, scientific and environmental context.
5. Develop skill in selecting the appropriate data mining algorithm for solving practical problems.

COURSE OUTCOMES:

After completing this course the student must demonstrate the knowledge and ability to:

1. Learn data warehouse principles, data mining concepts and working.
2. Understand various data preprocessing procedures and their application scenarios.
3. Discuss the data-mining tasks like classification, regression, clustering, association mining.
4. Understand the impact of machine learning solutions on the society and also the contemporary issues.
5. Explore a suitable data mining task to the problem.

UNIT – I:

Data warehouse: Introduction to Data warehouse, Difference between operational database systems and data warehouses, Data warehouse characteristics, Data warehouse Architecture and its components, Extraction Transformation-Loading, Logical (Multi-Dimensional), Data Modeling, Schema Design, Star and snow-Flake Schema, Fact Consultation, Fact Table, Fully Addictive, Semi-Addictive, Non Addictive Measures; Fact-Less Facts, Dimension Table Characteristics; OLAP Cube, OLAP Operations, OLAP Server Architecture-ROLAP, MOLAP and HOLAP.

UNIT –II:

Introduction to Data Mining: Introduction, What is Data Mining, Definition, KDD, Challenges, Data Mining Tasks, Data Processing, Data Cleaning, Missing data, Dimensionality Reduction, Feature Subset Selections, Discretization and Binaryzation, Data Transformation; Measures of Similarity and Dissimilarity-Basics.

UNIT – III:

Association Rules: Problem Definition, Frequent item set generation, The APRIORI Principle, support and confidence measures, association rule generation; APRIORI algorithm. The Partition Algorithms, FP-Growth Algorithms, Compact Representation of Frequent item Set-Maximal Frequent item set, closed frequent itemset.

UNIT – IV:

Classification: Problem Definition, General Approaches to solving classification problem, Evaluation of Classifiers, Classification techniques, Decision Trees-Decision trees construction,

Methods, for expressing attribute test conditions, Measures for selecting the best split, Algorithm for Decision tree induction; Naive- Bayes Classifier, Bayesian Belief Network; K-Nearest neighbor classification-Algorithm and characteristics.

UNIT – V:

Clustering: Problem Definition, Clustering Overview, Evaluation of Clustering algorithms, partitioning clustering-K-Means Algorithm, K-Means Additional issues, PAM Algorithm; Hierarchical Clustering Agglomerative Methods and divisive methods, Basic Agglomerative Hierarchical Clustering Algorithms Specific techniques, Key issues in Hierarchical Clustering, Strengths and weakness; outlier detection.

TEXT BOOKS

1. Jiawei Han and Micheline Kamber, -Data Mining: Concepts and Techniques, 2e, Elsevier, 2008.
2. Pangning Tan Vipin Kumar Micael Steinbach, -Introduction to data mining -, Pearson Education. XI.

REFERENCE BOOKS

1. Margaret H Dunham, -Data Mining Introductory and Advanced Topics, 2e, Pearson Education, 2006.
2. Amitesh Sinha, -Data Warehousing, Thomson Learning, 2007.
3. Arun K Pujari, -Data Mining Techniques, 3e, Universities Press.
4. Vikram Pudi, P Radha Krishna, -Data Mining, Oxford University Press



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DEPARTMENT OF INFORMATION TECHNOLOGY -R17

LINUX PROGRAMMING - A67PC2

B.Tech IV Year I Semester

L /T/ P/C
4 / 0/0/3

COURSE OBJECTIVES:

1. To understand and make effective use of Linux utilities and Shell scripting language (bash) to solve Problems.
2. To implement in C some standard Linux utilities such as ls, mv, cp etc. using system calls.
3. To develop the skills necessary for systems programming including file system programming, process and signal management, and interprocess communication.
4. To develop the basic skills required to write network programs using Sockets.

COURSE OUTCOMES:

1. Ability to understand the basic commands of Linux operating system and can write shell scripts
2. Ability to create file systems and directories and operate them.
3. Ability to create processes background and foreground etc. by fork() system calls.
4. Ability to create shared memory segments, pipes, message queues and can exercise interprocess communication.

UNIT – I:

Linux Utilities-

File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities. sed-Scripts, Operation, Addresses, Commands, awk-Execution, Fields and Records, Scripts, Operation, Patterns, Actions, Associative Arrays, String and Mathematical functions, System commands in awk, Applications. Shell programming with Bourne again shell (bash)- Introduction, shell responsibilities, pipes and Redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

UNIT – II:

Files and Directories-File Concept, File types, File System Structure, file metadata-

Inodes, kernel support for files, system calls for file I/O operations- open, create, read, write, close, lseek, dup2, file status information-stat family, file and record locking- fcntl function, file permissions- chmod, fchmod, file ownership- chown, lchown, links- soft and hard links- symlink, link, unlink.

Directories- Creating, removing and changing Directories- mkdir, rmdir, chdir, obtaining current working directory- getcwd, Directory contents, Scanning Directories- opendir, readdir, closedir, rewinddir functions.

UNIT – III:

Process - Process concept, Layout of a C program image in main memory. Process environment- environment list, environment variables, getenv, setenv, Kernel support for process, process identification, process control- process creation, replacing a process image, waiting for a process, process termination, zombie process, orphan process, system call interface for process management-fork, vfork, exit, wait, waitpid, exec family, Process Groups, Sessions and Controlling Terminal, Differences between threads and processes.

Signals-

Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise, alarm, pause, abort, sleep functions.

UNIT – IV:

Interprocess Communication - Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, pipe- creation, IPC between related processes using unnamed pipes, FIFOs- creation, IPC between unrelated processes using FIFOs (Named pipes), differences between unnamed and named pipes, popen and pclose library functions.

Message Queues-

Kernel support for messages, APIs for message queues, client/server example. Semaphores- Kernel support for semaphores, APIs for semaphores, file locking with semaphores.

UNIT – V:

Shared Memory- Kernel support for shared memory, APIs for shared memory, shared memory example.

Sockets- Introduction to Berkeley Sockets, IPC over a network, Client-Server model, Socket

address structures (unix domain and Internet domain), Sockets system calls for connection oriented protocol and connectionless protocol, example-client/server programs-Single Server-Client connection, Multiple simultaneous clients, Socket options-setsockopt and fcntl system calls, Comparison of IPC mechanisms.

TEXT BOOKS

1. Unix System Programming using C++, T. Chan, PHI.
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH.
3. Unix Network Programming, W. R. Stevens, PHI.

REFERENCE BOOKS

1. Beginning Linux Programming, 4th Edition, N. Mathew, R. Stones, Wrox, Wiley India Edition.
2. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson.
3. System Programming with C and Unix, A. Hoover, Pearson.
4. Unix System Programming, Communication, Concurrency and Threads, K. A. Robbins, Pearson Education.
5. Unix shell Programming, S. G. Kochan and P. Wood, 3rd edition, Pearson Education.
6. Shell Scripting, S. Parker, Wiley India Pvt. Ltd.
7. Advanced Programming in the unix Environment, 2nd edition, W. R. Stevens and S. A. Rago, Pearson Education.
8. Unix and Shell Programming, B. A. Forouzan and R. F. Gilberg, Cengage Learning.
9. Linux System Programming, Robert Love, O'Reilly, SPD.
10. C Programming Language, Kernighan and Ritchie, PHI.



**T K R COLLEGE OF ENGINEERING & TECHNOLOGY
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Department of INFORMATION TECHNOLOGY

PYTHON PROGRAMMING - A67PC3

B. Tech. VII Sem.

**L T P C
4 0 0 4**

Course Objectives: This course will enable students to

- Learn Syntax and Semantics and create Functions in Python.
- Handle Strings and Files in Python.
- Understand Lists, Dictionaries and Regular expressions in Python.
- Implement Object Oriented Programming concepts in Python.
- Build Web Services and introduction to Network and Database Programming in Python.

Course Outcomes: The students should be able to:

- Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
- Demonstrate proficiency in handling Strings and File Systems.
- Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
- Interpret the concepts of Object-Oriented Programming as used in Python.
- Implement exemplary applications related to Network Programming, Web Services and Databases in Python.

UNIT - I

Python Basics, Objects- Python Objects, Standard Types, Other Built-in Types, Internal Types, Standard Type Operators, Standard Type Built-in Functions, Categorizing the Standard Types, Unsupported Types

Numbers - Introduction to Numbers, Integers, Floating Point Real Numbers, Complex Numbers, Operators, Built-in Functions, Related Modules

Sequences - Strings, Lists, and Tuples, Mapping and Set Types

UNIT - II

FILES: File Objects, File Built-in Function [open()], File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments, File System, File Execution, Persistent Storage Modules, Related Modules

Exceptions: Exceptions in Python, Detecting and Handling Exceptions, Context Management, *Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions, *Creating Exceptions, Why Exceptions (Now)?, Why Exceptions at All?, Exceptions and the sys Module, Related Modules

Modules: Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions, Packages, Other Features of Modules

UNIT - III

Regular Expressions: Introduction, Special Symbols and Characters, Res and Python Multithreaded Programming: Introduction, Threads and Processes, Python, Threads, and the Global Interpreter Lock, Thread Module, Threading Module, Related Modules

UNIT - IV

GUI Programming: Introduction, Tkinter and Python Programming, Brief Tour of Other GUIs, Related Modules and Other GUIs

WEB Programming: Introduction, Web Surfing with Python, Creating Simple Web Clients, Advanced Web Clients, CGI-Helping Servers Process Client Data, Building CGI Application Advanced CGI, Web (HTTP) Servers

UNIT - V

Database Programming: Introduction, Python Database Application Programmer's Interface (DB-API), Object Relational Managers (ORMs), Related Modules

Textbook

1. Core Python Programming, Wesley J. Chun, Second Edition, Pearson.



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DEPARTMENT OF INFORMATION TECHNOLOGY -R17

INFORMATION SECURITY ASSESSMENTS & AUDITS - A67PE5

B.Tech IV Year I Semester

L/T/ P/C

3/0/0/3

COURSE OBJECTIVES:

1. To introduce the terminology, technology and its applications
2. To introduce the concept of Security Analyst
3. To introduce the tools, technologies & programming languages which are used in day to day security analyst job role

COURSE OUTCOMES:

1. Able to identify various metrics, their phases and various methodologies to analyze.
2. Able to use various auditing actions
3. Able to identify various vulnerabilities and solve them using vulnerability management techniques.
4. Able to analyze the types of assessments and generate assessment records.
5. Able to design a plan for configuration and reviews for development.

UNIT – I:

Information Security Performance Metrics and Audit: Security Metrics and Reporting, Common Issues and Variances of Performance Metrics, Introduction to Security Audit, Servers and Storage devices, Infrastructure and Networks, Communication Routes, Information Security Methodologies (Black-box, White-box, Grey-box), Phases of Information Security Audit and Strategies, Ethics of an Information Security Auditor etc. Maintain Healthy, Safe & Secure Working environment (NOS 9003).

UNIT – II:

Information Security Audit Tasks, Reports and Post Auditing Actions: Pre-audit checklist, Information Gathering, Vulnerability Analysis, External Security Audit, Internal Network Security Audit, Firewall Security Audit, IDS Security Auditing, Social Engineering Security Auditing, Web Application Security Auditing, Information Security Audit Deliverable & Writing Report, Result Analysis, Post Auditing Actions, Report Retention etc. Provide Data information in Standard formats (NOS 9004).

UNIT – III:

Vulnerability Management: Information Security Vulnerabilities — Threats and Vulnerabilities, Human-based Social Engineering, Computer-based Social Engineering, Social Media Countermeasures, Vulnerability Management — Vulnerability Scanning, Testing, Threat management, Remediation etc.

UNIT – IV:

Information Security Assessments: Vulnerability Assessment, Classification, Types of Vulnerability Assessment, Vulnerability Assessment Phases, Vulnerability Analysis Stages, Characteristics of a Good Vulnerability Assessment Solutions & Considerations, Vulnerability Assessment Reports — Tools and choosing a right Tool, information Security Risk Assessment, Risk Treatment, Residual Risk, Risk Acceptance, Risk Management Feedback Loops etc.

UNIT – V:

Configuration Reviews: Introduction to Configuration Management, Configuration Management Requirements-Plan-Control, Development of configuration Control Policies, Testing Configuration Management etc.

TEXT BOOKS

1. Assessing Information Security (strategies, tactics, logic and framework) by A. Vladimirov, K. Gavrilenko, and A. Michajlowski
2. The Art of Computer Virus Research and Defense by Peter Szor.

REFERENCE BOOKS

1. <https://www.wsans.oreadig-room/whitepapers/threats1implementing-vulnerability-management-process-34180>
2. <http://csrc.nist.gov/publications/nistpubs/800-40-Ver2/SP800-40v2.pdf>



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DEPARTMENT OF INFORMATION TECHNOLOGY -R17

BIG DATA ANALYTICS-II -A67PE53

B.Tech IV Year I Semester

**L/T/P/C
3/0/0/3**

COURSE OBJECTIVES:

1. To introduce the terminology, technology and its applications
2. To introduce the concept of Analytics for Business
3. To introduce the tools, technologies & programming languages which is used in day to day analytics cycle

COURSE OUTCOMES:

1. Able to design data architecture and manage, export the data onto the cloud with secure and safe working environment.
2. Ability to implement various big data tools to identify gaps in the data.
3. Ability to run the analyzed data on various environments.
4. Able to implement various machine learning algorithms.
5. Able to implement various data visualization tools.

UNIT – I:

Data Management (NOS 2101): Design Data Architecture and manage the data for analysis, understand various sources of Data like Sensors/signal/GPS etc. Data Management, Data Quality (noise, outliers, missing values, duplicated data) and Data Preprocessing. Export all the data onto Cloud ex. AWS/Rackspace etc.

Maintain Healthy, Safe & Secure Working Environment (NOS 9003) Introduction, workplace safety, Report Accidents & Emergencies, Protect health & safety as your work, course conclusion, assessment.

UNIT –II:

Big Data Tools (NOS 2101): Introduction to Big Data tools like Hadoop, Spark, Impala etc., Data ETL process, Identify gaps in the data and follow-up for decision making.

Provide Data/Information in Standard Formats (NOS 9004)

Introduction, Knowledge Management, Standardized reporting & compliances, Decision Models, course conclusion. Assessment

UNIT – III:

Big Data Analytics: Run descriptive to understand the nature of the available data, collate all the data sources to suffice business requirement, Run descriptive statistics for all the variables and observe the data ranges, Outlier detection and elimination.

UNIT – IV:

Machine Learning Algorithms (NOS 9003): Hypothesis testing and determining

themultiple analytical methodologies, Train Model on 2/3 sample data using various Statistical/Machine learning algorithms, Test model on 1/3 sample for prediction etc.

UNIT – V:

Data Visualization(NOS2101):Prepare the data for Visualization, Use tools like Tableau, Qlick View and D3, Draw insights out of Visualization tool. Product Implementation

TEXT BOOK

1. Student's Handbook for Associate Analytics.

REFERENCE BOOKS

1. Introduction to Data Mining, Tan, Steinbach and Kumar, Addison Wesley, 2006
2. Data Mining Analysis and Concepts, M. Zaki and W. Meira (the authors have kindly made an online version available): <http://www.dataminingbook.info/uploads/book.pdf>
3. Mining of Massive Datasets Jure Leskovec Stanford Univ. Anand Rajaraman Millway Labs Jeffrey D. Ullman, Stanford Univ.

(http://www.vistrails.org/index.php/Course:_Big_Data_Analysis)



**TKR COLLEGE OF ENGINEERING & TECHNOLOGY
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DEPARTMENT OF INFORMATION TECHNOLOGY -R17

HUMAN COMPUTER INTERACTION -A67PE5

B.Tech IV Year I Semester

**L/T/ P/C
3/0/0/3**

COURSE OBJECTIVES:

You will gain an overview of Human-Computer Interaction (HCI), with an understanding of user interface design in general, and alternatives to traditional, keyboard and mouse computing;

COURSE OUTCOMES:

1. Ability to apply HCI and principles to interaction design.
2. Ability to design certain tools for blind or PH people.

UNIT- I:

Introduction: Importance of user Interface — definition, importance of good design. Benefits of good design. A brief history of Screen design. The graphical user interface — popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user — Interface popularity, characteristics- Principles of user interface.

UNIT-II:

Design process—

Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions. Screen Designing:-

Design goals—

Screen planning and purpose, organizing screen elements, ordering of screen data and content — screen navigation and flow — Visually pleasing composition — amount of information — focus and emphasis — presentation information simply and meaningfully — information retrieval on web — statistical graphics — Technological consideration in interface design.

UNIT- III:

Windows — New and Navigation schemes selection of window, selection of devices based and screen based controls. Components — text and messages, Icons and increases — Multimedia, colors, uses problems, choosing colors.

UNIT- IV:

Software tools — Specification methods, interface — Building Tools.

UNIT- V:

Interaction Devices — Keyboard and function keys — pointing devices — speech recognition digitization and generation — image and video displays — drivers.

TEXT BOOKS

1. Theessentialguidetouserinterfacedesign,Wilbert0Galitz,WileyDreamTech.
2. Designingtheuserinterface.3rdEditionBenShneidermann,PearsonEducationAsia.

REFERENCE BOOKS

1. Human — Computer Interaction. Alan Dix, Janet Fincay, GreGoryd, Abowd, Russell Bealg, PearsonEducation
2. Interaction Design Prece, Rogers, Sharps. WileyDreamtech.
3. User Interface Design, Soren Lauesen , PearsonEducation.
4. Human —Computer Interaction,D.R.Olsen, CengageLearning.
5. Human —Computer Interaction, Smith – Atakan, CengageLearning.



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DEPARTMENT OF INFORMATION TECHNOLOGY -R17

SEMANTIC WEB AND SOCIAL NETWORKS -A67PE6

B.Tech IV Year I Semester

**L/T/ P/C
3/0/0/3**

COURSE OBJECTIVES:

1. To learn WebIntelligence
2. To learn Knowledge Representation for the SemanticWeb
3. To learn OntologyEngineering
4. To learn Semantic Web Applications, Services andTechnology
5. To learn Social Network Analysis and semanticweb

COURSE OUTCOMES:

1. Abilitytounderstandandknowledgerepresentationforthesemanticweb.
2. Ability to createontology.
3. Ability to build a blogs and socialnetworks

UNIT – I:

Thinking and Intelligent Web Applications, The Information Age, The World Wide Web,Limitations of Today’s Web, The Next Generation Web.Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents,Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT – II:

Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web – Resource Description Framework(RDF) / RDF Schema, Ontology WebLanguage(OWL),UML,XML/XML Schema.Ontology Engineering, Constructing Ontology, Ontology Development Tools, OntologyMethods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping.

UNIT – III:

Logic, Rule and Inference Engines. Semantic Web applications and services, SemanticSearch, e- learning, Semantic Bioinformatics, Knowledge Base.

UNIT – IV:

XML Based Web Services, Creating an OWL-S Ontology for Web Services, SemanticSearch Technology, Web Search Agents and Semantic Methods,What is social Networksanalysis, developmentofthesocialnetworksanalysis,ElectronicSourcesforNetworkAnalysis– Electronic Discussionnetworks.

UNIT – V:

BlogsandOnlineCommunities,WebBasedNetworks.BuildingSemanticWebApplicationsw ith social networkfeatures.

TEXT BOOKS

1. Thinking on the Web - Berners Lee, Godeland Turing, Wiley interscience.
2. Social Networks and the Semantic Web, Peter Mika, Springer.

REFERENCE BOOKS

1. Semantic Web Technologies, Trends and Research in Ontology Based Systems, J. Davies, Rudi Studer, Paul Warren, John Wiley & Sons.
2. Semantic Web and Semantic Web Services - Liyang Lu Chapman and Hall/CRC Publishers, (Taylor & Francis Group)
3. Information sharing on the semantic Web - Heiner Stuckenschmidt; Frank Van Harmelen, Springer Publications.
4. Programming the Semantic Web, T. Segaran, C. Evans, J. Taylor, O'Reilly, SPD.



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CLOUD COMPUTING -A67PE6

B.Tech IV Year I Semester

L/T/P/C
3/0/0/3

COURSE OBJECTIVES:

1. To explain the evolving computer model caned cloudcomputing.
2. Tointroducethevariouslevelsof servicesthatcanbeachievedbycloud.
3. To describe the security aspects incloud.

COURSE OUTCOMES:

1. Able to understand clusters and clustervirtualization
2. Able to migrate into acloud
3. Able to use infra structure and software as aservices.
4. Able to manage and monitor on variousapplication
5. computing and relatedconcepts

UNIT- I:

Systems Modeling, Clustering and Virtualization: Distributed System Models and Enabling Technologies. Computer Clusters for Scalable Parallel Computing. Virtual Machines and Virtualization of Clusters and Data centres.

UNIT-II:

Foundations: Introduction to Cloud Computing, migrating into a Cloud, Enriching the _Integration as a Service‘ Paradigm for the Cloud Era. The Enterprise Cloud Computing Paradigm.

UNIT- III:

Infrastructure as a Service (IAAS) & Platform and Software as a Service (PAAS / SAAS): Virtual machines provisioning and Migration services, On the Management of Virtual

machinesforCloudInfrastructures,EnhancingCloudComputingEnvironmentsusingacluster as a Service. Secure Distributed Data Storage in Cloud Computing. Aneka, Comet Cloud, T- Systems‘,Workflow Engine for Clouds. Understanding Scientific Applications for Cloud Environments.

UNIT- IV:

Monitoring, Management and Applications: An Architecture for Federated Cloud Computing, SLA Management in Cloud Computing, Performance Production for HPC on Clouds, Best Practices in Architecture Cloud Applications in the AWS cloud, Building Content Delivery Networks Clouds, Resource Cloud Mashups.

UNIT – V:

GovernanceandCaseStudies:OrganizationalReadinessandChangemanagementintheClo ud age. Data Security in the Cloud, Legal issues in Cloud computing. Achieving Production Readiness for CloudServices

TEXT BOOKS

1. Cloud Computing: Principles and Paradigms by Rajkumar B. a,
2. Distributed and Cloud Computing. Kal Hwang. Geoffrey C. Fox. Jack J. Dongarra. Elsevier. 2012.

REFERENCE BOOKS

1. Cloud Computing: A Practical Approach. Anthony T. Velte. Toby J. VeFte, Robert Elsenpeter. Tata McGraw Hill. 2011.
2. Enterprise Cloud Computing Gautam Shroif, Cambridge University Press. 2010.
3. Cloud Computing: Implementation, Management and Security, John W. Rittinouse, James F. Ransome. CRC Press, 2012.
4. Cloud Application Architectures: Building Applications and Infrastructure in the Cloud. George Reese, O'Reil SPD, 2011.
5. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Ktriaraswamy, Shahed Latif, O'Reil SPD, 2011.



TKR COLLEGE OF ENGINEERING & TECHNOLOGY
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DEPARTMENT OF INFORMATION TECHNOLOGY -R17

DISTRIBUTED DATABASES-A67PE6

B.Tech IV Year I Semester

L/T/ P/C
3/0/0/3

COURSE OBJECTIVES:

1. To acquire knowledge on parallel and distributed databases and its applications.
2. To study the usage and applications of Object Oriented databases.
3. To learn the modeling and design of databases
4. To acquire knowledge on parallel and distributed databases and its applications.
5. Equip students with principles and knowledge of parallel and object oriented databases.

COURSE OUTCOMES:

1. Understand theoretical and practical aspects of distributed database systems.
2. Study and identify various issues related to the development of distributed database system.
3. Understand the design aspects of object oriented database system and related development.

UNIT – I:

Features of Distributed versus Centralized Databases, Principles of Distributed Databases, Levels Of Distribution Transparency, Reference Architecture for Distributed Databases, Types of Data Fragmentation, Integrity Constraints in Distributed Databases, Distributed Database Design

UNIT – II:

Translation of Global Queries to Fragment Queries, Equivalence transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries. Optimization of Access Strategies, A Framework for Query Optimization, Join Queries, General Queries

UNIT – III:

The Management of Distributed Transactions, A Framework for Transaction Management, Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

UNIT – IV:

Reliability, Basic Concepts, Non-blocking Commitment Protocols, Reliability and concurrency Control, determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart, Distributed Database Administration, Catalog Management in Distributed Databases, Authorization and Protection

UNIT – V:

Architectural Issues, Alternative Client/Server Architectures, Cache Consistency, Object Management, Object Identifier Management, Pointer Swizzling, Object Migration,

Distributed Object Storage, Object Query Processing, Object Query Processor Architectures, Query

Processing Issues, Query Execution, Transaction Management, Transaction Management in Object DBMSs, Transactions as Objects Database Integration, Scheme Translation, Scheme Integration, Query Processing Query Processing Layers in Distributed Multi-DBMSs, Query Optimization

Issues Transaction Management Transaction and Computation Model, Multidatabase Concurrency Control, Multidatabase Recovery, Object Orientation and Interoperability, Object Management Architecture CORBA and Database Interoperability, Distributed Component Object Model, COM/OLE and Database Inter-operability, PUSH-Based Technologies

TEXT BOOKS

1. Distributed Databases Principles & Systems, Stefano Ceri, Giuseppe Pelagatti, TMH.
2. Principles of Distributed Database Systems, M. Tamer Ozsü, Patrick Valduriez, Pearson Education, 2nd Edition.

REFERENCE BOOKS

1. Distributed Database Systems, Chanda Ray, Pearson.
2. Distributed Database Management Systems, S.K. Rahimi and Frank S. Haug, Wiley.



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DEPARTMENT OF INFORMATION TECHNOLOGY -R17

SOFTWARE PROCESS AND PROJECT MANAGEMENT-A67PE7

B.Tech IV Year I Semester

L/T/P/C

3/0/0/ 3

COURSE OBJECTIVES:

At the end of the course, the student shall be able to:

1. To describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project.
2. To compare and differentiate organization structures and project structures.
3. To implement a project to manage project schedule, expenses and resources with the application of suitable project management tools.

COURSE OUTCOMES:

1. Able to design framework for software process assessment
2. Able to elaborate the problems in various phases of the software process
3. Able to reach the milestones in the software process workflows
4. Able to implement the different software metrics.

UNIT – I:

Software Process Maturity: Software maturity Framework, Principles of Software Process Change, Software Process Assessment, The Initial Process, The Repeatable Process, The Defined Process, The Managed Process, The Optimizing Process. **Process Reference Models Capability Maturity Model (CMM), CMMI, PCMM, PSP, TSP.**

UNIT – II:

Software Project Management Renaissance Conventional Software Management, Evolution of Software Economics, Improving Software Economics, The old way and the new way.

Life-Cycle Phases and Process artifacts Engineering and Production stages, inception phase, elaboration phase, construction phase, transition phase, artifact sets, management artifacts, engineering artifacts and pragmatic artifacts, model based software architectures.

UNIT – III:

Workflows and Checkpoints of process Software process workflows, Iteration workflows, Major milestones, Minor milestones, Periodic status assessments. **Process Planning** Work breakdown structures, Planning guidelines, cost and schedule estimating process, iteration planning process, Pragmatic planning.

UNIT – IV:

Project Organizations Line-of- business organizations, project organizations, evolution of

organizations, process automation. **Project Control and process instrumentation** The seven core metrics, management indicators, quality indicators, life-cycle expectations, Pragmatic software metrics, metrics automation.

UNIT V:

CCPDS-

RCaseStudyandFutureSoftwareProjectManagementPractices Modern Project Profiles, Next-Generation software Economics, Modern Process Transitions.

TEXT BOOKS

1. Managing the Software Process, *Watts S. Humphrey*, Pearson Education.
2. Software Project Management, *Walker Royce*, Pearson Education.

REFERENCE BOOKS

1. Effective Project Management: Traditional, Agile, Extreme, Robert Wysocki, Sixth edition, Wiley India, 2011.
2. An Introduction to the Team Software Process, Watts S. Humphrey, Pearson Education, 2000
3. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, TMH, 2006
4. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O'Reilly, 2006.



TKR COLLEGE OF ENGINEERING & TECHNOLOGY
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DEPARTMENT OF INFORMATION TECHNOLOGY -R17

ARTIFICIAL INTELLIGENCE -A67PE7

B.Tech IV Year I Semester

L/T/P/C

3/0/0/ 3

COURSE OBJECTIVES:

1. To learn the difference between optimal reasoning vs human like reasoning
2. To understand the notions of state space representation, exhaustive search, heuristic search along with the time and space complexities
3. To learn different knowledge representation techniques
4. To understand the applications of AI: namely Game Playing, Theorem Proving, Expert Systems, Machine Learning and Natural Language Processing

COURSE OUTCOMES:

1. PossesstheabilitytoformulateanefficientproblemspaceforaproblemexpressedinEnglish.
2. Possesstheabilitytoselectasearchalgorithmforaproblemandcharacterizeitstimeand spacecomplexities.
3. Possesstheskillforrepresentingknowledgeusingtheappropriatetechnique
4. PossesstheabilitytoapplyAItechniquesetosolveproblemsofGamePlaying, ExpertSystems,MachineLearningandNaturalLanguageProcessing

UNIT – I:

Introduction, History, Intelligent Systems, Foundations of AI, Sub areas of AI, Applications. Problem Solving–State-Space Search and Control Strategies: Introduction, General Problem Solving, Characteristics of Problem, Exhaustive Searches, Heuristic Search Techniques, Iterative-Deepening A*, Constraint Satisfaction. Game Playing, Bounded Look-ahead Strategy and use of Evaluation Functions, Alpha-Beta Pruning

UNIT – II:

Logic Concepts and Logic Programming: Introduction, Propositional Calculus, Propositional Logic, Natural Deduction System, Axiomatic System, Semantic Tableau System in Propositional Logic, Resolution Refutation in Propositional Logic, Predicate Logic, Logic Programming. Knowledge Representation: Introduction, Approaches to Knowledge Representation, Knowledge Representation using Semantic Network, Extended Semantic Networks for KR, Knowledge Representation using Frames.

UNIT – III:

Expert System and Applications: Introduction, Phases in Building Expert Systems, Expert System Architecture, Expert Systems Vs Traditional Systems, Truth Maintenance Systems, Application of Expert Systems, List of Shells and Tools. Uncertainty Measure– Probability Theory: Introduction, Probability Theory, Bayesian Belief Networks, Certainty Factor Theory, Dempster-Shafer Theory.

UNIT-IV:

Machine-Learning Paradigms: Introduction. Machine Learning Systems. Supervised and Unsupervised Learning. Inductive Learning. Learning Decision Trees (Text Book 2), Deductive Learning. Clustering, Support Vector Machines. Artificial Neural Networks: Introduction, Artificial Neural Networks, Single-Layer Feed Forward Networks, Multi-Layer Feed-Forward Networks, Radial-Basis Function Networks, Design Issues of Artificial Neural Networks, Recurrent Networks.

UNIT-V:

Advanced Knowledge Representation Techniques: Case Grammars, Semantic Web Natural Language Processing: Introduction, Sentence Analysis Phases, Grammars and Parsers, Types of Parsers, Semantic Analysis, Universal Networking Knowledge.\

TEXT BOOKS

1. Saroj Kaushik. Artificial Intelligence. Cengage Learning. 2011
2. Russell, Norvig: Artificial Intelligence, A Modern Approach, Pearson Education, Second Edition. 2004

REFERENCE BOOKS

1. Rich, Knight, Nair: Artificial Intelligence, Tata McGraw Hill, Third Edition 2009.
2. Introduction to Artificial Intelligence by Eugene Charniak, Pearson.
3. Introduction to Artificial Intelligence and expert systems Dan W. Patterson. PHI.
4. Artificial Intelligence by George Fluger Pearson fifth edition.



TKR COLLEGE OF ENGINEERING & TECHNOLOGY
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DEPARTMENT OF INFORMATION TECHNOLOGY -R17
E – COMMERCE -A67PE7

B.Tech IV Year I Semester

L/T/P/C

3/0/0/ 3

COURSE OBJECTIVES:

1. Identify the major categories and trends of e-commerce applications.
2. Identify the essential processes of an e-commerce system.
3. Identify several factors and web store requirements needed to succeed in e-commerce.
4. Discuss the benefits and trade-offs of various e-commerce clicks and bricks alternatives.
5. Understand the main technologies behind e-commerce systems and how these technologies interact.

COURSE OUTCOMES:

1. Ability to identify the business relationships between the organizations and their customers
2. Ability to perform various transactions like payment, data transfer and etc.

UNIT-I:

Electronic Commerce-Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications. Consumer Oriented Electronic commerce – Mercantile Process models.

UNIT-II:

Electronic payments systems–Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems. Inter Organizational Commerce – EDI, EDI Implementation, Value added networks.

UNIT – III:

Intra Organizational Commerce–workFlow, Automation Customization and internal Commerce, Supply chain Management.

UNIT –IV:

Corporate Digital Library – Document Library, digital Document types, corporate Data Warehouses. Advertising and Marketing – Information based marketing, Advertising on Internet, on-line marketing process, market research.

UNIT-V:

Consumer Search and Resource Discovery – Information search and Retrieval, Commerce Catalogues, Information Filtering. Multimedia – key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing's, Desktop video conferencing.

TEXT BOOK

1. Frontiers of electronic commerce — Kalakata, Whinston, Pearson.

REFERENCE BOOKS

1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, JohnWiley.
2. E-Commerce,S.JaiswalGalgotia.
3. E-Commerce, Efrain Turbon, Jae Lee, David King, H.MichaelChang.
4. Electronic Commerce Gary P.Schneider —Thomson.
5. E-Commerce—Business,Technology,Society,KennethC.Taudon,CarolGuyericoTraver.



TKR COLLEGE OF ENGINEERING & TECHNOLOGY

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DEPARTMENT OF INFORMATION TECHNOLOGY -R17

DATA WAREHOUSING AND DATA MINING LAB - A67PC7

B.Tech IV Year I Semester

L/T/P/C

0/0/3/2

COURSE OBJECTIVES:

Learn how to build a data warehouse and query it (using open source tools like Pentaho Data Integration and Pentaho Business Analytics), Learn to perform data mining tasks using a data mining toolkit (such as open source WEKA), Understand the data sets and data preprocessing, Demonstrate the working of algorithms for data mining tasks such as association rule mining, classification, clustering and regression, Exercise the data mining techniques with varied input values for different parameters.

COURSE OUTCOMES:

1. Ability to understand the various kinds of tools.
2. Demonstrate the classification clusters and etc. in large datasets

1. Build Data Warehouse and Explore WEKA

A. Build a Data Warehouse/Data Mart (using open source tools like Pentaho Data Integration tool, Pentaho Business Analytics; or other data warehouse tools like Microsoft-SSIS, Informatica, Business Objects, etc.).

1. Identify source tables and populate sample data
2. Design multi-dimensional data models namely Star, snowflake and Fact constellation schemas for any one enterprise (ex. Banking, Insurance, Finance, Healthcare, Manufacturing, Automobile, etc.).
3. Write ETL scripts and implement using data warehouse tools
4. Perform various OLAP operations such as slice, dice, rollup, drillup and pivot
5. Explore visualization features of the tool for analysis like identifying trends etc.
6. B. Explore WEKA Data Mining/Machine Learning Toolkit
7. Downloading and/or installation of WEKA data mining toolkit,
8. Understand the features of WEKA toolkit such as Explorer, Knowledge Flow interface, Experimenter, command-line interface.
9. Navigate the options available in the WEKA (ex. Select attributes panel, Preprocess panel, Classify panel, Cluster panel, Associate panel and Visualize panel)
10. Study the arff file format
11. Explore the available data sets in WEKA.
12. Load a data set (ex. Weather dataset, Iris dataset, etc.)

Load each dataset and observe the following

1. List the attribute names and their types
2. Number of records in each dataset

3. Identify the class attribute (if any)
4. Plot Histogram
5. Determine the number of records for each class.
6. Visualize the data in various dimensions

2. Perform data preprocessing tasks and Demonstrate performing association rule mining on data sets

- A. Explore various options available in Weka for preprocessing data and apply (like Discretization of Filters, Resample filter, etc.) on each dataset
- B. Load each dataset into Weka and run Apriori algorithm with different support and confidence values. Study the rules generated.
- C. Apply different discretization filters on numerical attributes and run the Apriori association rule algorithm. Study the rules generated. Derive interesting insights and observe the effect of discretization in the rule generation process.

3 Demonstrate performing classification on datasets

- A. Load each dataset into Weka and run 1d3, J48 classification algorithm. Study the classifier output. Compute entropy values, Kappa statistic.
- B. Extract if-then rules from the decision tree generated by the classifier, Observe the confusion matrix and derive Accuracy, F-measure, TPrate, FPrate, Precision and Recall values. Apply cross-validation strategy with various fold levels and compare the accuracy results.
- C. Load each dataset into Weka and perform Naïve-bayes classification and k-Nearest Neighbour classification. Interpret the results obtained.
- D. Plot ROC Curves
- E. Compare classification results of 1D3, J48, Naïve-Bayes and k-NN classifiers for each dataset, and deduce which classifier is performing best and poor for each dataset and justify.

4 Demonstrate performing clustering of datasets

- A. Load each dataset into Weka and run simple k-means clustering algorithm with different values of k (number of desired clusters). Study the clusters formed. Observe the sum of square errors and centroids, and derive insights.
- B. Explore other clustering techniques available in Weka.
- C. Explore visualization features of Weka to visualize the clusters. Derive interesting insights and explain.

5 Demonstrate performing Regression on datasets

- A. Load each dataset into Weka and build Linear Regression model. Study the clusters formed. Use Training set option. Interpret the regression model and derive patterns and $COFIC1USjOfIS$ from the regression results.
- B. Use options cross-validation and Percentage split and repeat running the Linear Regression Model. Observe the results and derive meaningful results.
- C. Explore Simple linear regression technique that only looks at one variable.

Resource Sites

1. <http://www.pentahocorn.com>,

2. <http://www.cswajkatoacflz.ml,wk>

DATA MINING LAB

COURSE OBJECTIVES:

1. To obtain practical experience using data mining techniques on real world datasets.
2. Emphasize hands-on experience working with all real datasets.
3. List of sample problems

COURSE OUTCOMES:

1. Ability to add mining algorithms as a component to the existing tools
2. Ability to apply mining techniques for realistic data.

Task 1: Credit Risk Assessment

Description:

The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a Customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible, Interest on these loans is the bank's profit Source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.
2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.
3. Commonsense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.
4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application.

Actual historical credit data is not always easy to come by because of confidentiality rules.

Here is one such dataset, consisting of 1000 actual cases collected in Germany. creditdataset (original) Excel spreadsheet version of the German credit data. In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer!)

A few notes on the German dataset.

1. DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).
2. owns_telephone. German phone rates are much higher than in Canada so fewer people own telephones.
3. foreign_worker. There are millions of these in Germany (many from Turkey). It is very hard to get German citizenship if you were not born of German parents.
4. There are 20 attributes used in judging a loan applicant. The goal is to classify the applicant into one of two categories, good or bad.

Subtasks: (Turn in your answers to the following tasks)

List all the categorical (or nominal) attributes and the real-valued attributes separately. (5 marks)

1. What attributes do you think might be crucial in making the credit assessment? Come up with some simple rules in plain English using your selected attributes. (5 marks)

2. One type of model that you can create is a Decision Tree — train a Decision Tree using the completed dataset as the training data. Report the model obtained after training. (10 marks)
3. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy? (10 marks)
4. Is testing on the training set as you did above a good idea? Why or Why not? (10 marks)
5. One approach for solving the problem encountered in the previous question is using cross-validation. Describe what is cross-validation briefly. Train a Decision Tree again using cross-validation and report your results. Does your accuracy increase/decrease? Why? (10 marks)
6. Check to see if the data shows a bias against -foreign workers (attribute 20), or -personal- status (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss. (10 marks)
7. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the am data file to get all the attributes initially before you start selecting the ones you want.) (10 marks)
8. Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifications equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 (using equal cost)? (10 marks)
9. Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees? How does the complexity of a Decision Tree relate to the bias of the model? (10 marks)
10. You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning — Explain this idea briefly. Try reduced error pruning for training your Decision Trees using cross-validation (you can do this in Weka) and report the Decision Tree you obtain? Also, report your accuracy using the pruned model. Does your accuracy increase? (10 marks)
11. (Extra Credit): How can you convert a Decision Trees into -if-then-else rules. Make up your own small Decision Tree consisting of 2-3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules — one such classifier in Weka is rules.PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one! Can you predict what attribute that might be in this dataset? One R classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained by

trainingaoneRclassifier.Ranktheperformanceofj48,PARTandoneR.(10marks)

Task Resources

1. Mentor lecture on DecisionTrees
2. Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)
3. DecisionTrees(Source:Tan,MSU)TomMitchell'sbookslides(SeeslidesonConcept Learning and Decision Trees)
4. Wekaresources:
5. Introduction to Weka (html version) (download pptversion)
6. DownloadWeka
7. WekaTutorial
8. ARFFformat
9. Using Weka from commandline

Task2:HospitalManagementSystem

DataWarehouseCOflSjStSDimensionTableandFactTab

le. REMEMBER The followingDimension

The dimension object (Dimension):

1. Name
2. Aribute S (Levels) , with one primarykey
3. Hierarchies
4. Onetimedimensionismust

. About levels andhierrarchies

Dimensionobjects(dimension)consistofasetoflevelsandasetofhierarchiesdefinedoverthose levels. The levels represent levels of aggregation. Hierarchies describe parent child relationships among a set oflevels.For example, a typical calendar dimension could contain five levels. Two hierarchies can be defined on these levels

1. H1:YearL>QuarterL>MonthL>WeekL>DayL
2. H2:YearL>WeekL>DayL

The hierarchies are described from parent to child, so that Year is the parent of Quarter, Quarter the parent of Month, and so forth.

About Unique Key Constraints

When you create a definition for a hierarchy, Warehouse Builder creates an identifierkeyforeachlevelofthehierarchyandauniquekeyconstraintonthelowestlevel(Base Level)

DesignaHospitalManagementsystemdatawarehouse(TARGET)consistsofDimension s Patient,Medicine,Supplier,Time.Wheremeasuresare_NOUNITS',UNITPRICE.

Assume the Relational database (SOURCE) table schemas as follows

1. TIME (day, month,year),
2. PATIENT (patient_name, Age, Address,etc..)
3. MEDICINE(Medicine_Brand_name,Drug_name,Supplier,no_units,Ulimit_Price,etc..)
4. SUPPLIER Supplier_name, Medicine_Brand name, Address,etc..)
5. If each Dimension has 6 levels, decide the levels and hierarchies, Assume the level names suitably.

Design the Hospital Management system data warehouse using all sachems. Give the example 4-D cube with assumptionnames.



TKR COLLEGE OF ENGINEERING & TECHNOLOGY
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DEPARTMENT OF INFORMATION TECHNOLOGY -R17

LINUX PROGRAMMING LAB -A67PC8

B.Tech IV Year I Semester

L/T/P/C
0/0/3/2

COURSE OBJECTIVES:

1. To write shell scripts to solve problems.
2. To implement some standard Linux utilities such as ls, cp etc using system calls.
3. To develop network-based applications using C.

COURSE OUTCOMES:

1. Ability to understand the Linux environment.
2. Ability to perform the file management and multiple tasks using shell scripts in Linux environment.

List of Sample Programs

Note: Use Bash for Shell scripts.

1. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
2. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
3. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
4. Write a shell script that receives any number of file names as arguments, checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.
5. 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 and other argument files.
6. Write a shell script to list all of the directory files in a directory.
7. Write a shell script to find factorial of a given integer.
8. Write an awk script to count the number of lines in a file that do not contain vowels.
9. Write an awk script to find the number of characters, words and lines in a file.
10. Write a C program that makes a copy of a file using standard I/O and system calls.
11. Implement in C the following Linux commands using System calls a). cat b) my
12. Write a C program to list files in a directory.
13. Write a C program to emulate the Unix ls —l command.
14. Write a C program to list for every file in a directory, its mode number and filename.
15. Write a C program that redirects standard output to a file. Ex: ls > f1.
16. Write a C program to create a child process and allow the parent to display -parent || and the child to display -child || on the screen.
17. Write a C program to create a Zombie process.
18. Write a C program that illustrates how an orphan is created.

19. Write a C program that illustrates how to execute two commands concurrently with a command pipe. Ex:- Is —l Isort
20. Write C programs that illustrate communication between two unrelated processes using named pipe(FIFO/pipe).
21. Write a C program in which a parent writes a message to a pipe and the child reads the message.
22. Write a C program (sender.c) to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.
23. Write a C program (receiver.c) that receives the messages (from the above message queue as specified in (22)) and displays them.
24. Write a C program that illustrates suspending and resuming processes using signals.
25. Write Client and Server programs in C for connection oriented communication between Server and Client processes using Unix Domain sockets to perform the following: Client process sends a message to the Server Process. The Server receives the message, reverse it and sends it back to the Client. The Client will then display the message to the standard output device.
26. Write Client and Server programs in C for connection oriented communication between Server and Client processes using Internet Domain sockets to perform the following: Client process sends a message to the Server Process. The Server receives the message, reverse it and sends it back to the Client. The Client will then display the message to the standard output device.
27. Write C programs to perform the following: One process creates a shared memory segment and writes a message(Hello) into it. Another process opens the shared memory segment and reads the message. -Hello). It will then display the message(Hello) to standard output device.

TEXT BOOKS

1. Beginning Linux Programming, 4th Edition, N. Matthew, R. Stones, Wrox, Wiley India Edition.
2. Advanced Unix Programming, N.B. Venkateswar UIU, BSPublications.
3. Unix and Shell Programming, M.G. Venkatesh Murthy, Pearson Education.
4. Unix Shells by Example, 4th Edition, Ellie Quigley, Pearson Education.
5. Sed and Awk, O. Dougherty & A. Robbins, 2nd edition, SPD.



**T K R COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous)**

Department of INFORMATION TECHNOLOGY

PYTHON PROGRAMMING LAB- A67PC9

B.Tech. VII Sem.

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

Prerequisites: Students should install Python on Linux platform.

Course Objectives:

- To be able to introduce core programming basics and program design with functions using Python programming language.
- To understand a range of Object-Oriented Programming, as well as in-depth data and information processing techniques.
- To understand the high-performance programs designed to strengthen the practical expertise.

Course Outcomes:

- Student should be able to understand the basic concepts scripting and the contributions of scripting language
- Ability to explore python especially the object-oriented concepts, and the built-in objects of Python.
- Ability to create practical and contemporary applications such as TCP/IP network programming, Web applications, discrete event simulations

List of Programs:

1. Write a program to demonstrate different number data types in Python.
2. Write a program to perform different Arithmetic Operations on numbers in Python.
3. Write a program to create, concatenate and print a string and accessing sub-string from a given string.
4. Write a python script to print the current date in the following format “Sun May 29 02:26:23 IST 2017”
5. Write a program to create, append, and remove lists in python.
6. Write a program to demonstrate working with tuples in python.
7. Write a program to demonstrate working with dictionaries in python.
8. Write a python program to find largest of three numbers.
9. Write a Python program to convert temperatures to and from Celsius, Fahrenheit. [Formula: $c/5 = f-32/9$]
10. Write a Python program to construct the following pattern, using a nested for loop

```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
```

* *

*

11. Write a Python script that prints prime numbers less than 20.
12. Write a python program to find factorial of a number using Recursion.
13. Write a program that accepts the lengths of three sides of a triangle as inputs. The program output should indicate whether or not the triangle is a right triangle (Recall from the Pythagorean Theorem that in a right triangle, the square of one side equals the sum of the squares of the other two sides).
14. Write a python program to define a module to find Fibonacci Numbers and import the module to another program.
15. Write a python program to define a module and import a specific function in that module to another program.
16. Write a script named **copyfile.py**. This script should prompt the user for the names of two text files. The contents of the first file should be input and written to the second file.
17. Write a program that inputs a text file. The program should print all of the unique words in the file in alphabetical order.
18. Write a Python class to convert an integer to a roman numeral.
19. Write a Python class to implement $\text{pow}(x, n)$
20. Write a Python class to reverse a string word by word.



**TKR COLLEGE OF ENGINEERING & TECHNOLOGY
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DEPARTMENT OF INFORMATION TECHNOLOGY -R17

DESIGN PATTERNS -A68PE1

B.Tech IV Year II Semester

**L/T/P/C
3/0/0/3**

COURSE OBJECTIVES:

1. The aim of the course is to appreciate the idea behind Design Patterns in handling common problems faced during building an application
2. This course covers all pattern types from creational to structural, behavioral to concurrency and highlights the scenarios when one pattern must be chosen over others.

COURSE OUTCOMES:

1. Create software designs that are scalable and easily maintainable
2. Understand the best use of Object Oriented concepts for creating truly OOP programs
3. Use creational design patterns in software design for class instantiation
4. Use structural design patterns for better class and object composition
5. Use behavioral patterns for better organization and communication between the objects.

UNIT – I:

Introduction: What is a design pattern? design patterns in Small talk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT – II:

Designing a Document Editor: Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary

UNIT – III:

Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT – IV:

Structural Pattern: Adapter, Bridge, Composite, Decorator, Façade, Flyweight, Proxy

UNIT – V:

Behavioral Patterns: Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template Method, Visitor.

TEXT BOOK

1. Design Patterns, Erich Gamma, Pearson Education

REFERENCE BOOKS

1. Pattern's in Java, Vol -I, Mark Grand, Wiley DreamTech.
2. Patterns in Java, Vol-II, Mark Grand, Wiley DreamTech.
3. JavaEnterpriseDesignPatternsVol-III,MarkGrand,WileyDreamTech.
4. Head First Design Patterns, Eric Freeman, O'reilypublications



TKR COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous)
DEPARTMENT OF INFORMATION TECHNOLOGY -R17
INTERNET OF THINGS -A68PE1

B.Tech IV Year II Semester

L/T/ P/C
3/0/0/3

COURSE OBJECTIVES:

1. To introduce the terminology, technology and its applications
2. To introduce the concept of M2M (machine to machine) with necessary protocols
3. To introduce the Python Scripting Language which is used in many IoT devices
4. To introduce the Raspberry PI platform, that is widely used in IoT applications
5. To introduce the implementation of web based services on IoT devices.

COURSE OUTCOMES:

1. Able to understand IOT and API's & various technologies using IOT
2. Able to identify network function virtualization
3. Able to use various features of python
4. Able to work on IOT devices
5. Able to develop IOT web application using python

UNIT – I:

Introduction to Internet of Things –

Definition and Characteristics of IoT, Physical Design of IoT –

IoT Protocols, IoT communication models, IoT Communication APIs, IoT Enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates, Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle.

UNIT – II:

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT. Basics of IoT System Management with NETCONF, YANG-NETCONF, YANG, SNMP, NETOPEER

UNIT – III:

Introduction to Python –

Language features of Python, Datatypes, data structures, Control flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling. Python packages - JSON, XML, HTTP Lib, URL Lib, SMTP Lib.

UNIT – IV:

IoT Physical Devices and Endpoints - Introduction to Raspberry PI - Interfaces (serial, SPI, I2C). Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.

UNIT – V:

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs. Webservice – Web server for IoT, Cloud for IoT, Python web application framework. Designing a RESTful web API

TEXT BOOKS

1. InternetofThings-AHands-onApproach,ArshdeepBahgaandVijayMadiseti,Universities Press, 2015, ISBN:9788173719547
2. GettingStartedwithRaspberryPi,MattRichardson&ShawnWallace,O'Reilly(SPD),2014, ISBN:9789350239759



TKR COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous)

DEPARTMENT OF INFORMATION TECHNOLOGY -R17

ADVANCED COMPUTER ARCHITECTURE -A68PE1

B.Tech IV Year II Semester

L/T/P/C

3/0/0/3

COURSE OBJECTIVES:

1. To emphasize on a concept of a complete system consisting of asynchronous interaction between concurrently executing hardware components and device driver software in order to illustrate the behavior of a computer system as a whole.
2. To understand the advanced concepts of computer architecture and exposing the major differentials of RISC and CISC, architectural characteristics.

COURSE OUTCOMES:

1. Able to understand the technology trends and various instruction set.
2. Able to solve various performance issues in pipelining
3. Able to design and develop the compiler based on the hardware.
4. Able to understand and design memory architecture
5. Able to identify and solve various practical issues in networks and clustering.

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.

UNIT – II:

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.

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

UNIT – IV:

MultiProcessorsandThreadLevelParallelism:MultiProcessorsandThreadlevelParallelism Introduction, Characteristics of application domain, Systematic shared memory architecture, Distributed shared – memory architecture,Synchronization.

UNIT – V:

InterConnectionandNetworks:Introduction,Interconnectionnetworkmedia,Practicalissu esin interconnecting networks, Examples of inter connection, Cluster, Designing of clusters. Intel Architecture:IntelIA-64ILPinembeddedandmobilemarketsFallaciesandpitfalls

TEXT BOOKS

1. John L. Hennessy, David A. Patterson, –Computer Architecture: A Quantitative Approach, 3rd Edition, An Imprint of Elsevier.

REFERENCE BOOKS

1. John P. Shen and Miikko H. Lipasti, –Modern Processor Design : Fundamentals of Super Scalar Processors, 2002, Beta Edition,McGrawHill
2. KaiHwang,FayeA.Brigs.,–ComputerArchitecture,andParallelProcessing,McGrawHill.,
3. DezsoSima,TerenceFountain,PeterKacsuk,—AdvancedComputerArchitecture–ADesign Space Approach, Pearson Education.



**TKR COLLEGE OF ENGINEERING & TECHNOLOGY
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DEPARTMENT OF INFORMATION TECHNOLOGY -R17

PREDICTIVE ANALYTICS -A68PE2

B.Tech IV Year II Semester

L/T/P/C

3/0/0/3

COURSE OBJECTIVES:

1. Able to understand various documentation types
2. Able to differentiate segmentation and regression

COURSE OUTCOMES:

1. Able to understand the predictive analytics
2. Able to identify and analyze the learning and decision trees.
3. Able to solve problems on pruning and complexity using multiple decision trees.
4. Able to implement time series methods.
5. Able to work on various documentation techniques.

UNIT – I:

Introduction to Predictive Analytics & Linear Regression (NOS 2101): What and Why Analytics, Introduction to Tools and Environment, Application of Modelling in Business, Databases & Types of data and variables, Data Modelling Techniques, Missing imputations etc. Need for Business Modelling. Regression — Concepts, Blue property-assumptions-Least Square Estimation. Variable Rationalization, and Model Building etc.

UNIT – II:

Logistic Regression (NOS 2101): Model Theory, Model fit Statistics, Model Conclusion, Analytics applications to various Business Domains etc. Regression Vs Segmentation — Supervised and Unsupervised Learning, Tree Building — Regression, Classification, Overfitting, Pruning and complexity. Multiple Decision Trees etc.

UNIT – III:

Objective Segmentation (NOS 2101): Regression Vs Segmentation — Supervised and Unsupervised Learning, Tree Building — Regression, Classification, Overfitting, Pruning and complexity, Multiple Decision Trees etc. Develop Knowledge, Skill and Competences (NOS 9005) Introduction to Knowledge skills & competences, Training & Development, Learning & Development, Policies and Record keeping, etc.

UNIT – IV:

Time Series Methods IForecasting, Feature Extraction (NOS 2101): Arima, Measures of Forecast Accuracy, STL approach, Extract features from generated model as Height, Average, Energy etc and Analyze for prediction. Project

UNIT – V:

Working with Documents (NOS 0703): Standard Operating Procedures for documentation and knowledge sharing. Defining purpose and scope of documents, Understanding structure of documents

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case studies, articles, whitepapers, technical reports, minutes of meeting etc., Style and format, Intellectual Property and Copyright, Document preparation tools—
Visio, PowerPoint, Word, Excel etc., Version Control, Accessing and updating corporate knowledge base. Peer review and feedback.

TEXT BOOK

1. Student's Handbook for Associate Analytics-III.

REFERENCE BOOK

1. Gareth James • Daniela Witten • Trevor Hastie Robert Tibshirani. An Introduction to Statistical Learning with Applications in R



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DEPARTMENT OF INFORMATION TECHNOLOGY -R17

INFORMATION SECURITY INCIDENT RESPONSE & MANAGEMENT -A68PE2

B.Tech IV Year II Semester

L/T/P/C

3/0/0/3

COURSE OBJECTIVES:

1. Able to understand network device configuration
2. Able to understand data backup techniques
3. Able to understand troubleshooting in network device
4. Able to understand the handling techniques for network security

COURSE OUTCOMES:

1. Able to configure various network device.
2. Able to solve various troubleshooting problems in network
3. Able to implement various techniques for data backup's
4. Able to identify and solve log correction
5. Able to face and solve various network attacks and detect malicious code.

UNIT- I:

Managing Information Security Services: Configuring Network Devices, Identifying Unauthorized Devices, Testing the Traffic Filtering Devices, Configuring Router, Configuring Modes — Router/Global/Interface/Line/Privilege EXEC/ROM/User EXEC, Configuring a banner/Firewall/Bastion Host/NTP server etc.

UNIT- II:

Troubleshooting Network Devices and Services: Introduction & Methodology of Troubleshooting, Troubleshooting of Network Communication-Connectivity-Network Devices- Network Slowdowns-Systems-Modems etc.

UNIT- III:

Information Security Incident Management & Data Backup: Information Security Incident Management overview-Handling-Response, Incident Response Roles and Responsibilities, Incident Response Process etc. Data Backup introduction, Types of Data Backup and its techniques, Developing an Effective Data Backup Strategy and Plan, Security Policy for Backup Procedures.

UNIT- IV:

Log Correlation: Computer Security Logs, Configuring & Analyzing Windows Logs, Log Management-Functions & Challenges, Centralized Logging and Architecture, Time Synchronization — NTP/NIST etc. Develop Knowledge Skill and competences (NOS 9005)

UNIT- V:

Handling Network Security Incidents: Network Reconnaissance Incidents, Network Scanning

Security Incidents, Network Attacks and Security Incidents, Detecting DoS Attack, DoS Response Strategies, Preventing/stopping a DoS Incident etc.

Handling Malicious Code Incidents: Incident Handling Preparation, Incident Prevention, Detection of Malicious Code, Containment Strategy) Evidence Gathering and Handling, Eradication and Recovery, Recommendations etc. Project.

TEXT BOOKS

1. Managing Information Security Risks, The Octave Approach by Christopher Alberts, and Audrey Dorofee
2. -Cryptography and Network Security (4th Edition) by (Author) William Stallings. ||

REFERENCE BOOKS

1. <https://www.sans.org/reading-room/whitepapers/incident/security-incident-handling-small-organizations-32979>



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DEPARTMENT OF INFORMATION TECHNOLOGY -R17

SOFTWARE TESTING METHODOLOGIES -A68PE2

B.Tech IV Year II Semester

L/T/P/C

3/0/0/3

COURSE OBJECTIVES:

1. To understand the software testing methodologies such as flow graphs and path testing, transaction flow testing, data flow testing, domain testing and logic based testing.

COURSE OUTCOMES:

1. Ability to apply the process of testing and various methodologies in testing for developed software.
2. Ability to write test cases for given software to test it before delivery to the customer.

UNIT – I:

Introduction: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs.

Flowgraphs and Path testing: Basic concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT – II:

Transaction Flow Testing: transaction flows, transaction flow testing techniques.

Dataflow testing: Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

UNIT – III:

Domain Testing: domains and paths, Nice & ugly domains, domain testing, domains and interface testing, domain and interface testing, domains and testability.

UNIT-IV:

Paths, Path products and Regular expressions: path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.

Logic Based Testing: overview, decision tables, path expressions, kv charts, specifications.

UNIT – V:

State, State Graphs and Transition testing: state graphs, good & bad state graphs, state testing, Testability tips.

Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools. (Students should be given an exposure to a tool like JMeter or Win-runner).

TEXT BOOKS

1. Software Testing techniques – Boris Beizer, Dreamtech, second edition.
2. Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.

REFERENCE BOOKS

1. The craft of software testing – Brian Marick, Pearson Education.
2. Software Testing, 3rd edition, P.C. Jorgensen, Aurbach Publications (Dist. by SPD).
3. Software Testing, N. Chauhan, Oxford University Press.
4. Introduction to Software Testing, P. Ammann & J. Offutt, Cambridge Univ. Press.
5. Effective methods of Software Testing, Perry, John Wiley, 2nd Edition, 1999.
6. Software Testing Concepts and Tools, P. Nageswara Rao, dreamtech Press.
7. Software Testing, M.G. Limaye, TMH.
8. Software Testing, S. Desikan, G. Ramesh, Pearson.
9. Foundations of Software Testing, D. Graham & Others, Cengage Learning.
10. Foundations of Software Testing, A.P. Mathur, Pearson.