



VIGNAN'S INSTITUTE OF MANAGEMENT AND TECHNOLOGY FOR WOMEN

(An Autonomous Institution)

[Sponsored by Lavu Educational Society, Affiliated to JNTUH & Approved by AICTE, New Delhi]
Kondapur (V), Ghatkesar (M), Medchal - Malkajgiri (D) - 501 301. Phone: 96529 10002/3



COMPUTER SCIENCE &ENGINEERING (AI & ML)

COURSE STRUCTURE-VR24

IV B.Tech.-I Semester

S.No.	Course Code	Course	L	T	P	Credits
1	ML701PC	Deep Learning	3	0	0	3
2	ML702PC	Nature Inspired Computing	2	0	0	2
3		Professional Elective -III	3	0	0	3
4		Professional Elective -IV	3	0	0	3
5		Open Elective - II	3	0	0	3
6	MS703BS	Professional Practice, Law & Ethics	2	0	0	2
7		Professional Elective - III Lab	0	0	2	1
8	ML704PC	Project Stage - I	0	0	6	3
		Total	16	0	8	20

IV B.Tech.-II Semester

S.No.	Course Code	Course	L	T	P	Credits
1		Professional Elective - V	3	0	0	3
2		Professional Elective – VI	3	0	0	3
3		Open Elective – III	3	0	0	3
4	ML801PC	Project Stage – II including Seminar	0	0	22	11
5		Total	9	0	22	20

Note: L-Theory

T-Tutorial

P-Practical

C-Credits



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Professional Elective -III

S.No.	Course Code	Course	L	T	P	Credits
1	IT731PE	Internet of Things	3	0	0	3
2	CS732PE	Data Mining	3	0	0	3
3	CS733PE	Scripting Languages	3	0	0	3
4	IT734PE	Mobile Application Development	0	0	22	11
5	CS735PE	Cloud Computing	9	0	22	20

Professional Elective -IV

S.No.	Course Code	Course	L	T	P	Credits
1	CS741PE	Quantum Computing	3	0	0	3
2	ML742PE	Expert Systems	3	0	0	3
3	IT743PE	Semantic Web	3	0	0	3
4	IT744PE	Game Theory	0	0	22	11
5	CS745PE	Mobile Computing	9	0	22	20

Professional Elective -V

S.No.	Course Code	Course	L	T	P	Credits
1	IT851PE	Social Network Analysis	3	0	0	3
2	ML852PE	Federated Machine Learning	3	0	0	3
3	IT853PE	Augmented Reality & Virtual Reality	3	0	0	3
4	IT854PE	Web Security	0	0	22	11
5	ML855PE	Ad-hoc & Sensor Networks	9	0	22	20

Professional Elective -VI

S.No.	Course Code	Course	L	T	P	Credits
1	EC861PE	Speech and Video Processing-ECE	3	0	0	3
2	ML862PE	Robotic Process Automation-ECE	3	0	0	3
3	ML863PE	Randomized Algorithms	3	0	0	3
4	ML864PE	Cognitive Computing	0	0	22	11
5	ML865PE	Conversational AI	9	0	22	20



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Open Elective-II

S.No.	Course Code	Course	L	T	P	Credits
1	CS721OE	Introduction to Natural Language Processing	3	0	0	3
2	ML722OE	AI applications	3	0	0	3

Open Elective-III

S.No.	Course Code	Course	L	T	P	Credits
1	ML831OE	Chatbots	3	0	0	3
2	ML832OE	Evolutionary Computing	3	0	0	3

B.Tech. CSE (AI & ML)	L	T	P	C
IV B.Tech.-I Semester	3	0	0	3

DEEP LEARNING

Course Objectives:

- To understand deep Learning algorithms and their applications in real-world data

Course Outcomes:

- Understand machine learning basics and neural networks
- Understand optimal usage of data for training deep models
- Apply CNN and RNN models for real-world data
- Evaluate deep models
- Develop deep models for real-world problems

UNIT - I:

Machine Learning Basics

Learning Algorithms, Capacity, Overfitting and Underfitting, Hyperparameters and Validation Sets, Estimators, Bias and Variance, Maximum Likelihood Estimation, Bayesian Statistics, Supervised Learning Algorithms, Unsupervised Learning Algorithms, Stochastic Gradient Descent, Building a Machine Learning Algorithm, Challenges Motivating Deep Learning

Deep Feedforward Networks Learning XOR, Gradient-Based Learning, Hidden Units, Architecture Design, Back-Propagation and Other Differentiation Algorithms

UNIT - II:

Regularization for Deep Learning

Parameter Norm Penalties, Norm Penalties as Constrained Optimization, Regularization and Under-Constrained Problems, Dataset Augmentation, Noise Robustness, Semi-Supervised Learning, Multi-Task Learning, Early Stopping, Parameter Tying and Parameter Sharing, Sparse Representations, Bagging and Other Ensemble Methods, Dropout, Adversarial Training, Tangent Distance, Tangent Prop, and Manifold Tangent Classifier, Optimization for Training Deep Models, Learning vs Pure Optimization, Challenges in Neural Network Optimization, Basic Algorithms, Parameter Initialization Strategies, Algorithms with Adaptive Learning Rates

UNIT - III:

Convolutional Networks

The Convolution Operation, Motivation, Pooling, Convolution and Pooling as an Infinitely Strong Prior, Variants of the Basic Convolution Function, Structured Outputs, Data Types, Efficient Convolution Algorithms, Random or Unsupervised Features

UNIT - IV:

Recurrent and Recursive Nets

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

UNIT - V:

Practical Methodology: Performance Metrics, Default Baseline Models, Determining Whether to Gather More Data, Selecting Hyperparameters, Debugging Strategies, Example: Multi-Digit Number Recognition

Applications: Large-Scale Deep Learning, Computer Vision, Speech Recognition, Natural Language Processing, Other Applications.

TEXT BOOKS:

1. Deep Learning by Ian Goodfellow, Yoshua Bengio and Aaron Courville, MIT Press.

REFERENCE BOOKS:

1. The Elements of Statistical Learning. Hastie, R. Tibshirani, and J. Friedman, Springer.
2. Probabilistic Graphical Models. Koller, and N. Friedman, MIT Press.
3. Bishop. C.M., Pattern Recognition and Machine Learning, Springer, 2006.
4. Yegnanarayana, B., Artificial Neural Networks PHI Learning Pvt. Ltd, 2009.
5. Golub, G.,H., and Van Loan, C.,F., Matrix Computations, JHU Press, 2013.
6. Satish Kumar, Neural Networks: A Classroom Approach, Tata McGraw-Hill Education, 2004.

B.Tech. CSE (AI & ML)	L	T	P	C
IV B.Tech.-I Semester	3	0	0	2

NATURE INSPIRED COMPUTING

Course Objectives:

- Knowledge on significance of evolutionary computing, neuro computing and swarm intelligence

Course Outcomes:

- Familiar with Evolutionary Computing algorithms
- Understand scope of neurocomputing
- Compare different Ant Colony Optimization algorithmic models.
- Understand the scope of artificial immune systems
- Tackle different real world problems

UNIT - I:

Evolutionary Computing

Problem Solving as a Search Task, Hill Climbing and Simulated Annealing, Evolutionary Biology, Evolutionary Computing, The Other Main Evolutionary Algorithms, From Evolutionary Biology to Computing, Scope of Evolutionary Computing

UNIT - II:

Neurocomputing

The Nervous System, Artificial Neural Networks, Typical ANNS and Learning Algorithms, From Natural to Artificial Neural Networks, Scope of Neurocomputing

UNIT - III:

Neurocomputing

The Nervous System, Artificial Neural Networks, Typical ANNS and Learning Algorithms, From Natural to Artificial Neural Networks, Scope of Neurocomputing

UNIT - IV:

Immunocomputing

The Immune System, Artificial Immune Systems, Bone Marrow Models, Negative Selection Algorithms, Clonal Selection and Affinity Maturation, Artificial Immune Networks, From Natural to Artificial Immune Systems, Scope of Artificial Immune Systems

UNIT - V:

Case Studies- Bioinformatics, Information Display

TEXT BOOKS:

1. Leandro Nunes de Castro - " Fundamentals of Natural Computing, Basic Concepts, Algorithms and Applications", Chapman & Hall/ CRC, Taylor and Francis Group, 2007
2. Albert Y.Zomaya - "Handbook of Nature-Inspired and Innovative Computing", Springer, 2006

REFERENCE BOOKS:

1. Floreano, D. and C. Mattiussi -"Bio-Inspired Artificial Intelligence: Theories, Methods, and Technologies" IT Press, 2008
2. Marco Dorigo, Thomas Stutzle -" Ant Colony Optimization", Prentice Hall of India, New Delhi, 2005
3. Vinod Chandra S S, Anand H S - "Machine Learning: A Practitioner's Approach", Prentice Hall of India, New Delhi, 2020

B.Tech. CSE (AI & ML)	L	T	P	C
IV Year – I Semester	3	0	0	3

INTERNET OF THINGS (Professional Elective – III)

Prerequisites:

- Computer organization, Computer Networks

Course Objectives:

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

Course Outcomes:

- Interpret the impact and challenges posed by IoT networks leading to new architectural models.
- Compare and contrast the deployment of smart objects and the technologies to connect them to network.
- Appraise the role of IoT protocols for efficient network communication.
- Identify the applications of IoT in Industry.

UNIT - I:

Introduction to Internet of Things –Definition and Characteristics of IoT, Physical Design of IoT, Logical Design of IoT, IoT Enabling Technologies, IoT Levels and Deployment Templates

Domain Specific IoTs – Home automation, Environment, Agriculture, Health and Lifestyle

UNIT - II:

IoT and M2M – M2M, Difference between IoT and M2M, SDN and NFV for IoT,
IoT System Management with NETCOZF, YANG- Need for IoT system Management, Simple Network management protocol, Network operator requirements, NETCONF, YANG, IoT Systems Management with NETCONF-YANG

UNIT - III:

IoT Systems – Logical design using Python-Introduction to Python – Python Data types & Data structures, Control flow, Functions, Modules, Packaging, File handling, Data/Time operations, Classes, Exception, Python packages of Interest for IoT

UNIT - IV:

IoT Physical Devices and Endpoints - Raspberry Pi, Linux on Raspberry Pi, Raspberry Pi Interfaces, Programming Raspberry PI with Python, Other IoT devices.
IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs, WAMP-AutoBahn for IoT, Xively Cloud for IoT, Python web application framework –Django, Designing a RESTful web API

UNIT - V:

Case studies- Home Automation, Environment-weather monitoring-weather reporting- air pollution monitoring, Agriculture.

TEXT BOOKS:

1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547.

REFERENCEBOOKS:

1. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759.

B.Tech. CSE (AI & ML)

L T P C

IV Year – I Semester

3 0 0 3

DATA MINING (Professional Elective–III)

Prerequisites:

1. Database Management System
2. Probability and Statistics

Course Objectives:

- Students will become acquainted with both the strengths and limitations of various data mining techniques like Association, Classification, Cluster and Outlier analysis.

Course Outcomes:

- Understand the need of data mining and pre-processing techniques.
- Perform market basket analysis using association rule mining.
- Utilize classification techniques for analysis and interpretation of data.
- Identify appropriate clustering and outlier detection techniques to handle complex data.
- Understand the mining of data from web, text and time series data.

UNIT - I:

Introduction to Data Mining:

What Data mining? Kinds of Data, Knowledge Discovery process, Data Mining Functionalities, Kinds of Patterns, Major Issues in Data Mining. Data Objects and Attribute Types, Basic Statistical Descriptions of Data, Data Visualization, Measuring Data Similarity and Dissimilarity, Data Pre-processing: Major Tasks in Data Pre-processing, Data Cleaning, Data Integration, Data Reduction, Data Transformation and Data Discretization.

UNIT - II:

Association Analysis: Basic Concepts, Market Basket Analysis, Apriori Algorithm, FP-growth, From Association Analysis to Correlation Analysis, Pattern Mining in Multilevel Associations and Multidimensional Associations.

UNIT - III:

Classification: Basic Concepts, Decision Tree Induction, Bayes Classification Methods, Rule-Based Classification, Metrics for Evaluating Classifier Performance, Ensemble Methods, Multilayer Feed-Forward Neural Network, Support Vector Machines, k-Nearest-Neighbor Classifiers.

UNIT - IV:

Cluster Analysis: Requirements for Cluster Analysis, Overview of Basic Clustering

Methods, Partitioning Methods-k-Means, k-Medoids, Hierarchical Methods-AGENES, DIANA, BIRCH, Density-Based Method-DBSCAN, Outlier Analysis: Types of Outliers, Challenges of Outlier Detection, and Overview of Outlier Detection Methods

UNIT - V:

Advanced Concepts: WebMining- Web Content Mining, Web Structure Mining, Web Usage Mining, Spatial Mining- Spatial Data Overview, Spatial Data Mining Primitives, Spatial Rules, Spatial Classification Algorithm, Spatial Clustering Algorithms, Temporal Mining- Modeling Temporal Events, Time Series, Pattern Detection, Sequences, Temporal Association Rules.

TEXT BOOKS:

1. Jiawei Han, Micheline Kamber, Jian Pei., Data Mining: Concepts and Techniques, 3rd Edition, Morgan Kaufmann/Elsevier, 2012.
2. Margaret H Dunham, Data Mining Introductory and Advanced Topics, 2nd Edition, Pearson Education, India, 2006.

REFERENCEBOOKS:

1. Data Mining Techniques, Arun K Pujari, 3rd Edition, Universities Press.
2. Pang-Ning Tan, Michael Steinbach, Anuj Karpatne and Vipin Kumar, Introduction to Data Mining, 2nd Edition, Pearson Education India, 2021.
3. Amitesh Sinha, Data Warehousing, Thomson Learning, India, 2007.

B.Tech. CSE (AI & ML) L T P C
IV Year – I Semester 3 0 0 3

SCRIPTING LANGUAGES

Prerequisites:

1. A course on “Computer Programming and Data Structures”.
2. A course on “Object Oriented Programming Concepts”.

Course Objectives:

- This course introduces the script programming paradigm
- Introduces scripting languages such as Perl, Ruby and TCL.
- Learning TCL

Course Outcomes:

- Comprehend the differences between typical scripting languages and typical system and application programming languages.
- Gain knowledge of the strengths and weakness of Perl, TCL and Ruby; and select an appropriate language for solving a given problem.
- Acquire programming skills in scripting language

UNIT - I:

Introduction: Ruby, Rails, The structure and Execution of Ruby Programs, Package Management with RUBYGEMS, Ruby and web: Writing CGI scripts, cookies, Choice of Webservers, SOAP and web services

RubyTk – Simple Tk Application, widgets, Binding events, Canvas, scrolling

UNIT - II:

Extending Ruby: Ruby Objects in C, the Jukebox extension, Memory allocation, Ruby Type System, Embedding Ruby to Other Languages, Embedding a Ruby Interpreter

UNIT - III:

Introduction to PERL and Scripting

Scripts and Programs, Origin of Scripting, Scripting Today, Characteristics of Scripting Languages, Uses for Scripting Languages, Web Scripting, and the universe of Scripting Languages. PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines.

UNIT - IV:

Advanced perl

Finer points of looping, pack and unpack, filesystem, eval, data structures, packages, modules, objects, interfacing to the operating system, Creating Internet ware

applications, Dirty Hands Internet Programming, security Issues.

UNIT - V:

TCL

TCL Structure, syntax, Variables and Data in TCL, Control Flow, Data Structures, input/output, procedures, strings, patterns, files, Advance TCL- eval, source, exec and uplevel commands, Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C Interface.

Tk

Visual Tool Kits, Fundamental Concepts of Tk, Tk by example, Events and Binding, Perl-Tk.

TEXT BOOKS:

1. The World of Scripting Languages, David Barron, Wiley Publications.
2. Ruby Programming language by David Flanagan and Yukihiro Matsumoto O'Reilly
3. "Programming Ruby" The Pragmatic Programmers guide by Dabve Thomas Second edition

REFERENCEBOOKS:

1. Open Source Web Development with LAMP using Linux Apache, MySQL, Perl and PHP, J.Lee and B. Ware (Addison Wesley) Pearson Education.
2. Perl by Example, E. Quigley, Pearson Education.
3. Programming Perl, Larry Wall, T. Christiansen and J. Orwant, O'Reilly, SPD.
4. Tcl and the Tk Tool kit, Ousterhout, Pearson Education.
5. Perl Power, J. P. Flynt, Cengage Learning.

B.Tech. CSE (AI & ML)	L	T	P	C
IV Year – I Semester	3	0	0	3
MOBILE APPLICATION DEVELOPMENT (Professional Elective–III)				

Prerequisites:

1. Acquaintance with JAVA programming
2. A Course on DBMS

Course Objectives:

- To demonstrate their understanding of the fundamentals of Android operating systems
- To improve their skills of using Android software development tools
- To demonstrate their ability to develop software with reasonable complexity on mobile platform
- To demonstrate their ability to deploy software to mobile devices
- To demonstrate their ability to debug programs running on mobile devices

Course Outcomes:

- Understand the working of Android OS Practically.
- Develop Android user interfaces
- Develop, deploy and maintain the Android Applications.

UNIT - I:

Introduction to Android Operating System: Android OS design and Features – Android development framework, SDK features, Installing and running applications on Android Studio, Creating AVDs, Types of Android applications, Best practices in Android programming, Android tools Android application components – Android Manifest file, Externalizing resources like values, themes, layouts, Menus etc, Resources for different devices and languages, Runtime Configuration Changes Android Application Lifecycle – Activities, Activity lifecycle, activity states, monitoring state changes

UNIT - II:

Android User Interface: Measurements – Device and pixel density independent measuring unit-s Layouts – Linear, Relative, Grid and Table Layouts User Interface (UI) Components – Editable and non-editable TextViews, Buttons, Radio and Toggle Buttons, Checkboxes, Spinners, Dialog and pickers Event Handling – Handling clicks or changes of various UI components Fragments – Creating fragments, Lifecycle of fragments, Fragment states, Adding fragments to Activity, adding, removing and replacing fragments with fragment transactions, interfacing between fragments and Activities, Multi-screen Activities

UNIT - III:

Intents and Broadcasts: Intent–Using intents to launch Activities, Explicitly starting new Activity, Implicit Intents, Passing data to Intents, Getting results from Activities, Native

Actions, using Intent to dial a number or to send SMS

Broadcast Receivers – Using Intent filters to service implicit Intents, Resolving Intent filters, finding and using Intents received within an Activity

Notifications – Creating and Displaying notifications, Displaying Toasts

UNIT - IV:

Persistent Storage: Files – Using application specific folders and files, creating files, reading data from files, listing contents of a directory Shared Preferences – Creating shared preferences, saving and retrieving data using Shared Preference

UNIT - V:

Database – Introduction to SQLite database, creating and opening a database, creating tables, inserting retrieving and etindelg data, Registering Content Providers, Using content Providers (insert, delete, retrieve and update)

Text Books:

1. Professional Android 4 Application Development, Reto Meier, Wiley India, (Wrox), 2012.

REFERENCE BOOKS:

1. Android Application Development for Java Programmers, James C Sheusi, Cengage Learning, 2013.
2. Beginning Android 4 Application Development, Wei-Meng Lee, Wiley India (Wrox), 2013.

B.Tech. CSE (AI & ML)	L	T	P	C
IV Year – I Semester	3	0	0	3
CLOUD COMPUTING (Professional Elective–III)				

Prerequisites:

1. A course on “Computer Networks”.
2. A course on “Operating System”.

Course Objectives:

- This course provides an insight into cloud computing.
- Topics covered include- Cloud Computing Architecture, Deployment Models, Service Models, Technological Drivers for Cloud Computing, Networking for Cloud Computing and Security in Cloud Computing.

Course Outcomes:

- Understand different computing paradigms and potential of the paradigms and specifically cloud computing
- Understand cloud service types, cloud deployment models and technologies supporting and driving the cloud
- Acquire the knowledge of programming models for cloud and development of software application that runs the cloud and various services available from major cloud providers
- Understand the security concerns and issues in cloud computing
- Acquire the knowledge of advances in cloud computing.

UNIT - I:

Computing Paradigms, Cloud Computing Fundamentals, Cloud Computing Architecture and Management

UNIT - II:

Cloud Deployment Models, Cloud Service Models, Technological Drivers for Cloud Computing: SOA and Cloud, Multicore Technology, Web 2.0 and Web 3.0, Pervasive Computing, Operating System, Application Environment

UNIT - III:

Virtualization, Programming Models for Cloud Computing: MapReduce, Cloud Haskell, Software Development in Cloud

UNIT - IV:

Networking for Cloud Computing: Introduction, Overview of Data Center Environment, Networking Issues in Data Centers, Transport Layer Issues in DCNs, Cloud Service Providers

UNIT - V:

Security in Cloud Computing, and Advanced Concepts in Cloud Computing

Text Books:

1. Chandrasekaran, K. Essentials of cloud computing. CRC Press, 2014

REFERENCE BOOKS:

1. Cloud Computing: Principles and Paradigms, Editors: Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Wiley, 2011
2. Enterprise Cloud Computing - Technology, Architecture, Applications, Gautam Shroff, Cambridge University Press, 2010
3. Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010

B.Tech. CSE (AI & ML)	L	T	P	C
IV Year – I Semester	3	0	0	3
QUANTUM COMPUTING (Professional Elective – IV)				

Course Objectives:

- To introduce the fundamentals of quantum computing
- The problem-solving approach using finite dimensional mathematics

Course Outcomes:

- Understand basics of quantum computing
- Understand physical implementation of Qubit
- Understand Quantum algorithms and their implementation
- Understand The Impact of Quantum Computing on Cryptography

UNIT - I:

History of Quantum Computing: Importance of Mathematics, Physics and Biology. Introduction to Quantum Computing: Bits Vs Qubits, Classical Vs Quantum logical operations

UNIT - II:

Background Mathematics: Basics of Linear Algebra, Hilbert space, Probabilities and measurements. **Background Physics:** Paul's exclusion Principle, Superposition, Entanglement and super-symmetry, density operators and correlation, basics of quantum mechanics, Measurements in bases other than computational basis. **Background Biology:** Basic concepts of Genomics and Proteomics (Central Dogma)

UNIT - III:

Qubit: Physical implementations of Qubit. Qubit as a quantum unit of information. The Bloch sphere

Quantum Circuits: single qubit gates, multiple qubit gates, designing the quantum circuits. Bell states.

UNIT - IV:

Quantum Algorithms: Classical computation on quantum computers. Relationship between quantum and classical complexity classes. Deutsch's algorithm, Deutsch's-Jozsa algorithm, Shor's factorization algorithm, Grover's search algorithm.

UNIT - V:

Noise and error correction: Graph states and codes, Quantum error correction, fault-tolerant computation. **Quantum Information and Cryptography:** Comparison between classical and quantum information theory. Quantum Cryptography, Quantum teleportation

Text Books:

1. Nielsen M. A., Quantum Computation and Quantum Information, Cambridge.

REFERENCE BOOKS:

1. Quantum Computing for Computer Scientists by Noson S. Yanofsky and Mirco A. Mannucci
2. Benenti G., Casati G. and Strini G., Principles of Quantum Computation and Information, Vol. I: Basic Concepts, Vol II.
3. Basic Tools and Special Topics, World Scientific. Pittenger A. O., An Introduction to Quantum Computing Algorithms.

B.Tech. CSE (AI & ML)	L	T	P	C
IV Year I Sem.	3	0	0	3
EXPERT SYSTEMS (Professional Elective – IV)				

Course Objectives:

- Understand the basic techniques of artificial intelligence.
- Understand the Non-monotonic reasoning and statistical reasoning.

Course Outcomes:

- Apply the basic techniques of artificial intelligence.
- Discuss the architecture of an expert system and its tools.
- Understand the importance of building an expert systems
- Understand various problems with an expert systems

UNIT - I:

Introduction to AI programming languages, Blind search strategies, Breadth-first – Depth-first – Heuristic search techniques Hill Climbing – Best first – A Algorithms AO* algorithm – game trees, Min-max algorithms, game playing – Alpha-beta pruning.

UNIT - II:

Knowledge representation issues predicate logic – logic programming Semantic nets-frames and inheritance, constraint propagation; Representing Knowledge using rules, Rules-based deduction systems.

UNIT - III:

Introduction to Expert Systems, Architecture of expert systems, Representation and organization of knowledge, Basics characteristics, and types of problems handled by expert systems.

UNIT - IV:

Expert System Tools: Techniques of knowledge representations in expert systems, knowledge engineering, system-building aids, support facilities, stages in the development of expert systems.

UNIT - V:

Building an Expert System: Expert system development, Selection of the tool, Acquiring Knowledge, Building process.

Problems with Expert Systems: Difficulties, common pitfalls in planning, dealing with domain experts, difficulties during development.

TEXT BOOKS:

1. Elain Rich and Kevin Knight, “Artificial Intelligence”, Tata McGraw-Hill, New

Delhi.

2. Waterman D.A., "A Guide to Expert Systems", Addison Wesley Longman.

REFERENCE BOOKS:

1. Stuart Russel and other Peter Norvig, "Artificial Intelligence – A Modern Approach", Prentice-Hall,
2. Patrick Henry Winston, "Artificial Intelligence", Addison Wesley,
3. Patterson, Artificial Intelligence & Expert System, Prentice Hall India, 1999.
4. Hayes-Roth, Lenat, and Waterman: Building Expert Systems, Addison Wesley,
5. Weiss S.M. and Kulikowski C.A., "A Practical Guide to Designing Expert Systems", Rowman &Allanheld, New Jersey.

B.Tech. CSE (AI & ML)	L	T	P	C
IV Year I Sem.	3	0	0	3
SEMANTIC WEB (Professional Elective – IV)				

Course Objectives:

- Introduce Semantic Web Vision and learn Web intelligence
- Understanding about XML, RDF, RDFS, OWL
- Querying Ontology and Ontology Reasoning
- To learn Semantic Web Applications, Services and Technology
- To learn Knowledge Representation for the Semantic Web

Course Outcomes:

- Understand the characteristics of the semantic web technology
- Understand the concepts of Web Science, semantics of knowledge resource and ontology
- Describe logic semantics and inference with OWL.
- Use ontology engineering approaches in semantic applications
- Learn about web graph processing for various applications such as search engine, community detection

UNIT - I:

Introduction: Introduction to Semantic Web, the Business Case for the Semantic Web, XML and Its Impact on the Enterprise.

UNIT - II:

Web Services: Uses, Basics of Web Services, SOAP, UDDI, Orchestrating Web Services, Securing Web Services, Grid Enabled and Semantic Web of Web Services.

UNIT - III:

Resource Description Framework: Features, Capturing Knowledge with RDF.

XML Technologies: XPath, The Style Sheet Family: XSL, XSLT, and XSL FO, XQuery, XLink, XPointer, XInclude, XMLBase, XHTML, XForms, SVG.

UNIT - IV:

Taxonomies and Ontologies: Overview of Taxonomies, Defining the Ontology Spectrum, Topic Maps, Overview of Ontologies, Syntax, Structure, Semantics, and Pragmatics, Expressing Ontologies Logically, Knowledge Representation.

UNIT - V:

Semantic Web Application: Semantic Web Services, e-Learning, Semantic Bioinformatics, Enterprise Application Integration, Knowledge Base.

Semantic Search Technology: Search Engines, Semantic Search, Semantic Search Technology, Web Search Agents, Semantic Methods, Latent Semantic Index Search, TAP, Swoogle

TEXT BOOKS:

1. The Semantic Web: A Guide to the Future of XML, Web Services, and Knowledge Management by Michael C. Daconta, Leo J. Obrst , Kevin T. Smith, Wiley Publishing, Inc.
2. Peter Mika, Social Networks and the Semantic Web, Springer

REFERENCE BOOKS:

1. Thinking on the Web - Berners Lee, Godel and Turing, Wiley Interscience
2. The Semantic Web: A Guide to the Future of XML, Web Services, and Knowledge Management by Michael C. Daconta, Leo J. Obrst , Kevin T. Smith, Wiley Publishing, Inc.
3. Semantic Web Technologies, Trends and Research in Ontology Based Systems, J. Davies, R. Studer, P. Warren, John Wiley & Sons.
4. Semantic Web and Semantic Web Services - Liyang Lu Chapman and Hall/CRC Publishers, (Taylor & Francis Group)
5. Information Sharing on the semantic Web - Heiner Stuckenschmidt; Frank Van Harmelen, Springer Publications.
6. Programming the Semantic Web, T. Segaran, C. Evans, J. Taylor, O'Reilly, SPD.

B.Tech. CSE (AI & ML) L T P C

IV Year I Sem. 3 0 0 3

GAME THEORY (Professional Elective – IV)

Course Objectives:

- The course will explain in depth the standard equilibrium concepts (such as Nash equilibrium, Subgame-Perfect Nash Equilibrium, and others) in Game Theory.

Course Outcomes:

- Understand the basic concepts of game theory and solutions
- Understand different types of equilibrium interpretations
- Understand and analyze knowledge and solution concepts
- Analyze extensive games with perfect information

UNIT - I:

Introduction- Game Theory, Games and Solutions, Game Theory and the Theory of Competitive Equilibrium, Rational Behavior, The Steady State and Deductive Interpretations, Bounded Rationality Terminology and Notation

Nash Equilibrium- Strategic Games, Nash Equilibrium, Examples, Existence of a Nash Equilibrium, Strictly Competitive Games, Bayesian Games: Strategic Games with Imperfect Information

UNIT - II:

Mixed, Correlated, and Evolutionary Equilibrium -Mixed Strategy Nash Equilibrium, Interpretations of Mixed Strategy Nash Equilibrium, Correlated Equilibrium, Evolutionary Equilibrium

Rationalizability and Iterated Elimination of Dominated Actions- Rationalizability Iterated Elimination of Strictly Dominated Actions, Iterated Elimination of Weakly Dominated Actions

UNIT - III:

Knowledge and Equilibrium -A Model of Knowledge Common Knowledge, Can People Agree to Disagree? Knowledge and Solution Concepts, The Electronic Mail Game

UNIT - IV:

Extensive Games with Perfect Information -Extensive Games with Perfect Information, Subgame Perfect Equilibrium, Two Extensions of the Definition of a Game, The Interpretation of a Strategy, Two Notable Finite Horizon Games, Iterated Elimination of Weakly Dominated Strategies

Bargaining Games -Bargaining and Game Theory, A Bargaining Game of Alternating Offers, Subgame Perfect Equilibrium, Variations and Extensions

UNIT - V:

Repeated Games - The Basic Idea Infinitely Repeated Games vs. Finitely Repeated Games, Infinitely Repeated Games: Definitions, Strategies as Machines, Trigger Strategies: Nash Folk Theorems, Punishing for a Limited Length of Time: A Perfect Folk Theorem for the Limit of Means Criterion, Punishing the Punisher: A Perfect Folk Theorem for the Overtaking Criterion, Rewarding Players Who Punish: A Perfect Folk Theorem for the Discounting Criterion, The Structure of Subgame Perfect Equilibria Under the Discounting Criterion, Finitely Repeated Game

TEXT BOOKS:

1. A course in Game Theory, M. J. Osborne and A. Rubinstein, MIT Press.

REFERENCE BOOKS:

1. Game Theory, Roger Myerson, Harvard University Press.
2. Game Theory, D. Fudenberg and J. Tirole, MIT Press.
3. Theory of Games and Economic Behavior, J. von Neumann and O. Morgenstern, New York: John Wiley and Sons.
4. Games and Decisions, R.D. Luce and H. Raiffa, New York: John Wiley and Sons.
5. Game Theory, G. Owen, 2nd Edition, New York: Academic Press.

B.Tech. CSE (AI & ML)	L	T	P	C
IV Year I Sem.	3	0	0	3
MOBILE COMPUTING (Professional Elective – IV)				

Prerequisites:

1. Computer Networks
2. Distributed Systems / Distributed Operating Systems

Course Objectives:

- To make the student understand the concept of mobile computing paradigm, its novel applications and limitations, typical mobile networking infrastructure through a popular GSM protocol, the issues of various layers of mobile networks and their solutions.

Course Outcomes:

- Understand the concept of mobile computing paradigm, its novel applications and limitations.
- Analyze and develop new mobile applications
- Understand the issues of various layers of mobile networks and their solutions.
- Classify data delivery mechanisms

UNIT - I:

Introduction

Mobile Communications, Mobile Computing–Paradigm, Promises/Novel Applications and Impediments and Architecture; Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices.

GSM – Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS, CSHSD, DECT.

UNIT - II:

(Wireless) Medium Access Control (MAC)

Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA, Wireless LAN/(IEEE 802.11)

Mobile Network Layer

IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation, Route Optimization, DHCP.

UNIT - III:

Mobile Transport Layer

Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

Database Issues

Database Hoarding & Caching Techniques, Client-Server Computing & Adaptation, Transactional Models, Query processing, Data Recovery Process & QoS Issues.

UNIT - IV:**Data Dissemination and Synchronization**

Communications Asymmetry, Classification of Data Delivery Mechanisms, Data Dissemination, Broadcast Models, Selective Tuning and Indexing Methods, Data Synchronization – Introduction, Software, and Protocols

UNIT - V:**Mobile Ad hoc Networks (MANETs)**

Introduction, Applications & Challenges of a MANET, Routing, Classification of Routing Algorithms, Algorithms such as DSR, AODV, DSDV, Mobile Agents, Service Discovery.

TEXT BOOKS:

1. Jochen Schiller, “Mobile Communications”, Addison-Wesley, Second Edition, 2009.
2. Raj Kamal, “Mobile Computing”, Oxford University Press, 2007, ISBN: 0195686772

REFERENCE BOOKS:

1. Asoke K Talukder, Hasan Ahmed, Roopa Yavagal Mobile Computing: Technology, Applications and Service Creation, McGraw Hill Education.

B.Tech. CSE (AI & ML) L T P C
IV Year - I Semester 3 0 0 3

**INTRODUCTION TO NATURAL LANGUAGE PROCESSING
(Open Elective – II)**

Prerequisites:

1. Data structures and compiler design

Course Objectives:

- Introduction to some of the problems and solutions of NLP and their relation to linguistics and statistics.

Course Outcomes:

- Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
- Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems
- Able to manipulate probabilities, construct statistical models over strings and trees, and estimate parameters using supervised and unsupervised training methods.
- Able to design, implement, and analyze NLP algorithms; and design different language modeling Techniques.

UNIT - I:

Finding the Structure of Words: Words and Their Components, Issues and Challenges, Morphological Models

Finding the Structure of Documents: Introduction, Methods, Complexity of the Approaches, Performances of the Approaches, Features

UNIT - II:

Syntax I: Parsing Natural Language, Treebanks: A Data-Driven Approach to Syntax, Representation of Syntactic Structure, Parsing Algorithms

UNIT - III:

Syntax II: Models for Ambiguity Resolution in Parsing, Multilingual Issues

Semantic Parsing I: Introduction, Semantic Interpretation, System Paradigms, Word Sense

UNIT - IV:

Semantic Parsing II: Predicate-Argument Structure, Meaning Representation Systems

UNIT - V:

Language Modeling: Introduction, N-Gram Models, Language Model

Evaluation, Bayesian parameter estimation, Language Model Adaptation, Language Models- class based, variable length, Bayesian topic based, Multilingual and Cross Lingual Language Modeling

TEXT BOOKS:

1. Multilingual natural Language Processing Applications: From Theory to Practice – Daniel M. Bikel and Imed Zitouni, Pearson Publication

REFERENCE BOOKS:

1. Speech and Natural Language Processing - Daniel Jurafsky & James H Martin, Pearson Publications.
2. Natural Language Processing and Information Retrieval: Tanvier Siddiqui, U.S. Tiwary.

B.Tech. CSE (AI & ML)	L	T	P	C
IV Year - I Semester	3	0	0	3
AI APPLICATIONS (Open Elective – II)				

Prerequisites:

1. Fundamentals of AI

Course Objectives:

- To give deep knowledge of AI and how AI can be applied in various fields to make life easy.

Course Outcomes:

- Correlate AI and solutions to modern problems.
- Use of AI in business applications
- Application of AI in manufacturing automation
- Use of AI in streaming of data and Network applications

UNIT - I:

Alibaba: Using Artificial Intelligence To Power The Retail And Business-To-Business Services Of The Future

Amazon: Using Deep Learning To Drive Business Performance

UNIT - II:

McDonald's: Using Robots And Artificial Intelligence To Automate Processes

Walmart: Using Artificial Intelligence To Keep Shelves Stacked And Customers Happy

UNIT - III:

LinkedIn: Using Artificial Intelligence To Solve The Skills Crisis

Netflix: Using Artificial Intelligence To Give Us A Better TV Experience

UNIT - IV:

Salesforce: How Artificial Intelligence Helps Businesses Understand Their Customers

Uber: Using Artificial Intelligence To Do Everything

UNIT - V:

Siemens: Using Artificial Intelligence And Analytics To Build The Internet Of Trains

Tesla: Using Artificial Intelligence To Build Intelligent Cars

Text Books:

1. Artificial Intelligence in Practice: How 50 Successful Companies Used AI and Machine Learning to Solve Problems, Bernard Marr, Matt Ward, Wiley.

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L T P C

IV Year - I Semester

2 0 0 2

PROFESSIONAL PRACTICE, LAW & ETHICS**Course Objectives:**

- Understand the types of roles they are expected to play in the society as practitioners of the engineering profession.
- To develop some ideas of the legal and practical aspects of their profession.

Course Outcomes:

- Practice ethics and rule of the land in their profession
- Follow the principles and elements of legal contracts
- Able to resolve disputes pertaining to arbitration, reconciliation
- Aware of intellectual property loss

UNIT - I:

Professional Practice and Ethics: Definition of Ethics, Professional Ethics-Engineering Ethics, Personal Ethics; Code of Ethics - Profession, Professionalism, Professional Responsibility, Conflict of Interest, Gift Vs Bribery, Environmental breaches, Negligence, Deficiencies in state-of-the-art; Vigil Mechanism, Whistle blowing, protected disclosures. Introduction to GST- Various Roles of Various Stake holders

UNIT - II:

Law of Contract: Nature of Contract and Essential elements of valid contract, Offer and Acceptance, Consideration, Capacity to contract and Free Consent, Legality of Object. Unlawful and illegal agreements, Contingent Contracts, Performance and discharge of Contracts, Remedies for breach of contract. Contracts-II: Indemnity and guarantee, Contract of Agency, Sale of goods Act -1930: General Principles, Conditions & Warranties, Performance of Contract of Sale.

UNIT - III:

Arbitration, Conciliation and ADR (Alternative Dispute Resolution) system: Arbitration – meaning, scope and types – distinction between laws of 1940 and 1996; UNCITRAL model law – Arbitration and expert determination; Extent of judicial intervention; International commercial arbitration;

UNIT - IV:

Arbitration agreements – essential and kinds, validity, reference and interim measures by court; Arbitration tribunal – appointment, challenge, jurisdiction of arbitral tribunal, powers, grounds of challenge, procedure and court assistance; Distinction between conciliation, negotiation, mediation and arbitration, confidentiality, resort to judicial proceedings, costs; Dispute Resolution Boards; Lok Adalats.

UNIT - V:

Law relating to Intellectual property: Introduction – meaning of intellectual property, main forms of IP, Copyright, Trademarks, Patents and Designs, Secrets; Law relating to Copyright in India including Historical evolution of Copy Rights Act, 1957, Meaning of copyright – computer programs, Ownership of copyrights and assignment, Criteria of infringement, Piracy in Internet – Remedies and procedures in India; Law relating to Patents under Patents Act, 1970

Text Books:

1. Professional Ethics: R. Subramanian, Oxford University Press, 2015.
2. Ravinder Kaur, Legal Aspects of Business, 4e, Cengage Learning, 2016.

REFERENCE BOOKS:

1. Wadhwa (2004), Intellectual Property Rights, Universal Law Publishing Co.
2. T. Ramappa (2010), Intellectual Property Rights Law in India, Asia Law House.
3. O.P. Malhotra, Law of Industrial Disputes, N.M. Tripathi Publishers.

B.Tech. CSE (AI & ML)	L T P C
IV Year - I Semester	0 0 2 1
INTERNET OF THINGS LAB (Professional Elective – III)	

Course Objectives:

- To introduce the raspberry PI platform, that is widely used in IoT applications
- To introduce the implementation of distance sensor on IoT devices

Course Outcomes:

- Ability to introduce the concept of M2M (machine to machine) with necessary protocols and get awareness in implementation of distance sensor
- Get the skill to program using python scripting language which is used in many IoT devices

List of Experiments

1. Using Raspberry pi
 - a. Calculate the distance using a distance sensor.
 - b. Interface an LED and switch with Raspberry pi.
 - c. Interface an LDR with Raspberry Pi.
2. Using Arduino
 - a. Calculate the distance using a distance sensor.
 - b. Interface an LED and switch with Aurdino.
 - c. Interface an LDR with Aurdino
 - d. Calculate temperature using a temperature sensor.
3. Using Node MCU
 - a. Calculate the distance using a distance sensor.
 - b. Interface an LED and switch with Raspberry pi.
 - c. Interface an LDR with Node MCU
 - d. Calculate temperature using a temperature sensor.
4. Installing OS on Raspberry Pi
 - a) Installation using PiImager
 - b) Installation using image file
 - Downloading an Image
 - Writing the image to an SD card
 - using Linux
 - using Windows
 - Booting up Follow the instructions given in the URL
<https://www.raspberrypi.com/documentation/computers/getting-started.html>

5. Accessing GPIO pins using Python

a) Installing GPIO Zero library.

update your repositories list:

install the package for Python 3:

b) Blinking an LED connected to one of the GPIO pin

c) Adjusting the brightness of an LED Adjust the brightness of an LED (0 to 100, where 100 means maximum brightness) using the in-built PWM wavelength.

6. Create a DJANGO project and an app.

7. Create a DJANGO view for weather station REST API

8. Create DJANGO template

9. Configure MYSQL with DJANGO framework

TEXT BOOKS:

1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madiseti, Universities Press, 2015, ISBN: 9788173719547.
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759.

REFERENCE BOOKS:

1. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer, 2016
2. N. Ida, Sensors, Actuators and Their Interfaces, Scitech Publishers, 2014.

B.Tech. CSE (AI & ML)	L	T	P	C
IV Year - I Semester	0	0	2	1
DATA MINING LAB (Professional Elective – III)				

Prerequisites:

1. A course on “Database Management System

Course Objectives:

- The course is intended to obtain hands-on experience using data mining software.
- Intended to provide practical exposure of the concepts in data mining algorithms

Course Outcomes:

- Apply preprocessing statistical methods for any given raw data.
- Gain practical experience of constructing a data warehouse.
- Implement various algorithms for data mining in order to discover interesting patterns from large amounts of data.
- Apply OLAP operations on data cube construction

List of Experiments: Experiments using Weka/ Pentaho/Python

1. Data Processing Techniques:
(i) Data cleaning (ii) Data transformation – Normalization (iii) Data integration
2. Partitioning - Horizontal, Vertical, Round Robin, Hash based
3. Data Warehouse schemas – star, snowflake, fact constellation
4. Data cube construction – OLAP operations
5. Data Extraction, Transformations & Loading operations
6. Implementation of Attribute oriented induction algorithm
7. Implementation of apriori algorithm
8. Implementation of FP – Growth algorithm
9. Implementation of Decision Tree Induction
10. Calculating Information gain measures
11. Classification of data using Bayesian approach
12. Classification of data using K – nearest neighbour approach
13. Implementation of K – means algorithm
14. Implementation of BIRCH algorithm
15. Implementation of PAM algorithm
16. Implementation of DBSCAN algorithm

TEXT BOOKS:

1. Data Mining – Concepts and Techniques - JIAWEI HAN & MICHELINE

KAMBER, Elsevier.

2. Data Warehousing, Data Mining & OLAP- Alex Berson and Stephen J. Smith- Tata McGraw-Hill Edition, Tenth reprint 2007

REFERENCE BOOKS:

1. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Anuj Karpatne, Introduction to Data Mining, Pearson Education

B.Tech. CSE (AI & ML)	L	T	P	C
IV Year - I Semester	0	0	2	1
SCRIPTING LANGUAGES LAB (Professional Elective – III)				

Prerequisites:

1. Any High level programming language (C, C++)

Course Objectives:

- To Understand the concepts of scripting languages for developing web based projects
- To understand the applications the of Ruby, TCL, Perl scripting languages

Course Outcomes:

- Ability to understand the differences between Scripting languages and programming languages
- Gain some fluency programming in Ruby, Perl, TCL

List of Experiments

1. Write a Ruby script to create a new string which is n copies of a given string where n is a non-negative integer
2. Write a Ruby script which accept the radius of a circle from the user and compute the parameter and area.
3. Write a Ruby script which accept the users first and last name and print them in reverse order with a space between them
4. Write a Ruby script to accept a filename from the user print the extension of that
5. Write a Ruby script to find the greatest of three numbers
6. Write a Ruby script to print odd numbers from 10 to 1
7. Write a Ruby script to check two integers and return true if one of them is 20 otherwise return their sum
8. Write a Ruby script to check two temperatures and return true if one is less than 0 and the other is greater than 100
9. Write a Ruby script to print the elements of a given array
10. Write a Ruby program to retrieve the total marks where subject name and marks of a student stored in a hash
11. Write a TCL script to find the factorial of a number
12. Write a TCL script that multiplies the numbers from 1 to 10
13. Write a TCL script for sorting a list using a comparison function
14. Write a TCL script to (i) create a list (ii) append elements to the list (iii) Traverse the list (iv) Concatenate the list
15. Write a TCL script to comparing the file modified times.
16. Write a TCL script to Copy a file and translate to native format.
 - a) Write a Perl script to find the largest number among three numbers.

- b) Write a Perl script to print the multiplication tables from 1-10 using subroutines.
18. Write a Perl program to implement the following list of manipulating functions
- a) Shift
 - b) Unshift
 - c) Push
19. a) Write a Perl script to substitute a word, with another word in a string.
b) Write a Perl script to validate IP address and email address.
20. Write a Perl script to print the file in reverse order using command line arguments

TEXT BOOKS:

1. The World of Scripting Languages, David Barron, Wiley Publications.
2. Ruby Programming language by David Flanagan and Yukihiro Matsumoto
O'Reilly
3. "Programming Ruby" The Pragmatic Programmers guide by Dabve Thomas
Second edition

REFERENCE BOOKS:

1. Open Source Web Development with LAMP using Linux Apache, MySQL, Perl
and PHP, J.Lee and B. Ware (Addison Wesley) Pearson Education.
2. Perl by Example, E. Quigley, Pearson Education.
3. Programming Perl, Larry Wall, T. Christiansen and J. Orwant, O'Reilly, SPD.
4. Tcl and the Tk Tool kit, Ousterhout, Pearson Education.
5. Perl Power, J. P. Flynt, Cengage Learning.

B.Tech. CSE (AI & ML)	L	T	P	C
IV Year - I Semester	0	0	2	1
MOBILE APPLICATION DEVELOPMENT LAB (Professional Elective – III)				

Course Objectives:

- To learn how to develop Applications in an android environment.
- To learn how to develop user interface applications.
- To learn how to develop URL related applications.

Course Outcomes:

- Understand the working of Android OS Practically.
- Develop user interfaces.
- Develop, deploy and maintain the Android Applications.

List of Experiments

1. Create an Android application that shows Hello + name of the user and run it on an emulator.
(b) Create an application that takes the name from a text box and shows hello message along with the name entered in the text box, when the user clicks the OK button.
2. Create a screen that has input boxes for User Name, Password, Address, Gender (radio buttons for male and female), Age (numeric), Date of Birth (Datepicker), State (Spinner) and a Submit button. On clicking the submit button, print all the data below the Submit Button. Use (a) Linear Layout (b) Relative Layout and (c) Grid Layout or Table Layout.
3. Develop an application that shows names as a list and on selecting a name it should show the details of the candidate on the next screen with a “Back” button. If the screen is rotated to landscape mode (width greater than height), then the screen should show list on left fragment and details on the right fragment instead of the second screen with the back button. Use Fragment transactions and Rotation event listeners.
4. Develop an application that uses a menu with 3 options for dialing a number, opening a website and to send an SMS. On selecting an option, the appropriate action should be invoked using intents.
5. Develop an application that inserts some notifications into Notification area and whenever a notification is inserted, it should show a toast with details of the notification.
6. Create an application that uses a text file to store usernames and passwords (tab separated fields and one record per line). When the user submits a login name and password through a screen, the details should be verified with the text file data and if they match, show a dialog saying that login is successful. Otherwise, show the dialog with a Login Failed message.

7. Create a user registration application that stores the user details in a database table.
8. Create a database and a user table where the details of login names and passwords are stored. Insert some names and passwords initially. Now the login details entered by the user should be verified with the database and an appropriate dialog should be shown to the user.
9. Create an admin application for the user table, which shows all records as a list and the admin can select any record for edit or modify. The results should be reflected in the table.
10. Develop an application that shows all contacts of the phone along with details like name, phone number, mobile number etc.
11. Create an application that saves user information like name, age, gender etc. in shared preference and retrieves them when the program restarts.
12. Create an alarm that rings every Sunday at 8:00 AM. Modify it to use a time picker to set alarm time.

TEXT BOOKS:

1. Professional Android 4 Application Development, Reto Meier, Wiley India, (Wrox), 2012.
2. Android Application Development for Java Programmers, James C Sheusi, Cengage, 2013.

REFERENCE BOOKS:

1. Beginning Android 4 Application Development, Wei-Meng Lee, Wiley India (Wrox), 2013.

B.Tech. CSE (AI & ML)	L T P C
IVYear - I Semester	0 0 2 1
CLOUD COMPUTING LAB (Professional Elective – III)	

Course Objectives:

- This course provides an insight into cloud computing
- Topics covered include- distributed system models, different cloud service models, service-oriented architectures, cloud programming and software environments, resource management.

Course Outcomes:

- Understand various service types, delivery models and technologies of a cloud computing environment.
- Understand the ways in which the cloud can be programmed and deployed.
- Understand cloud service providers like Cloudsim, Globus Toolkit etc.
- Examine various programming paradigms suitable to solve real world and scientific problems using cloud services.

List of Experiments

1. Install Virtualbox/VMware Workstation with different flavors of Linux or windows OS on top of windows7 or 8.
2. Install a C compiler in the virtual machine created using virtual box and execute Simple Programs
3. Create an Amazon EC2 instance and set up a web-server on the instance and associate an IP address with the instance.
4. Install Google App Engine. Create a hello world app and other simple web applications using python/java.
5. Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not present in CloudSim.
6. Find a procedure to transfer the files from one virtual machine to another virtual machine.
7. Find a procedure to launch virtual machine using trystack (Online Openstack Demo Version)
8. Install Hadoop single node cluster and run simple applications like word count.
9. Create a database instance in the cloud using Amazon RDS.
10. Create a database instance in the cloud using Google Cloud SQL

TEXT BOOKS:

1. Essentials of cloud Computing: K. Chandrasekhran, CRC press, 2014

REFERENCE BOOKS:

1. Cloud Computing: Principles and Paradigms by Rajkumar Buyya, James Broberg and Andrzej
2. M. Goscinski, Wiley, 2011.
3. Distributed and Cloud Computing, Kai Hwang, Geoffery C. Fox, Jack J. Dongarra, Elsevier, 2012.
4. Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010