BONAM VENKATA CHALAMAYYA ENGINERING COLLEGE
(AUTONOMOUS)
ODALAREVU – 533 210, Andhra Pradesh, India
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
DETAILED SYLLABUS FOR REGULATIONS – BR20
UG: B.Tech CSE (ARTIFICIAL INTELLIGENCE AND DATA SCIENCE)
IV Year – I SEMESTER

S.No	Course Code	Courses	L	T	P	Credits
1	20CS7D09 20AD7D07 20AD7D08 20CS7D18	**Professional Elective-III** 1. Cryptography and Network Security 2 Reinforcement Learning 3. Social Media Analytics 4. Block Chain Technologies	3	0	0	3
2	20CS7D13 20CS7D16 20CS7D11 20AD7D09	**Professional Elective-IV** 1. Software Testing Methodologies 2. Computer Vision 3. Adhoc and Sensor Networks 4. NOSQL Databases	3	0	0	3
3	20AD7D10 20AD7D11 20AD7D12 20AD7D13	**Professional Elective-V** 1. Social Network Analysis 2. Recommender Systems 3. AI Chatbots 4. Data Visualization	3	0	0	3
4	20CS7E04 20CE7E03 20EC7E03 20EE7E03	**Open Elective -III** 1. Nature Inspired Computing Techniques 2. Disaster Management 3. Embedded Systems 4. Electrical Distribution Systems	2	0	2	3
5	20CS7E05 20EC7E04 20ME7E04 20CE7E04	**Open Elective- IV** 1. Secure Coding Techniques 2. 5G Communications 3. 3D Printing Technologies 4. Project Management	2	0	2	3
6	20HS7E01 20HS7E02 20HS7E03 20HS7E04	**Humanity and Social Science Elective** 1. Resource Management 2. Industrial Management 3. Management Science 4. IPR and Patents	3	0	0	3
7	20HS7S01	English for Employability	1	0	2	2
8	20CS7P02	Industrial/Research Internship 2 months after III_I Evaluated during IV_I	0	0	6	3
		Total	17	0	12	23

IV Year - I Semester	Code: 20CS7D09	L	T	P	C
		3	0	0	3

CRYPTOGRAPHY AND NETWORK SECURITY

Course Outcomes:

By the end of the course the student

- ✓ Identify information security goals, classical encryption techniques
- ✓ Compare and apply different encryption and decryption techniques
- ✓ Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms
- ✓ Apply different digital signature algorithms to achieve authentication
- ✓ Apply network security basics, analyze different attacks on networks and evaluate the performance of firewalls and security protocols like SSL, IPSec, and PGP

UNIT I

Introduction: Elements of Information security, Security attacks, services & mechanisms, A model of network security, Symmetric Cipher Model, Substitution Techniques, Transportation Techniques, Steganography

UNIT II

Block Ciphers & Symmetric Key Cryptography

Traditional Block Cipher Structure, Block Cipher Design Principles, Data Encryption Standard, AES-Structure, Transformation functions, Key Expansion.

UNIT III

Number Theory: Prime and Relatively Prime Numbers, Modular Arithmetic, Fermat's and Euler's Theorems, The Chinese Remainder theorem.

Public Key Cryptography: Principles, public key cryptography algorithms, RSA Algorithms, Diffie Hellman Key Exchange, Elgamal encryption & decryption.

UNIT IV

Cryptographic Hash Functions & Digital Signatures

Application of Cryptographic hash Functions, Requirements & Security, Secure Hash Algorithm, Message Authentication Functions, Requirements & Security, and HMAC & CMAC. Digital Signatures, NIST Digital Signature Algorithm. Key management & distribution.

UNIT V

Transport Level Security: Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Shell (SSH), **Electronic Mail Security:** Pretty Good Privacy (PGP) and S/MIME.**P Security:** IP Security Overview, IP Security Architecture.

Text Books:

1. Cryptography & Network Security: Principles and Practices, William Stallings, PEA, Sixth edition.
2. Introduction to Computer Networks & Cyber Security, Chwan Hwa Wu, J.David Irwin, CRC press

Reference Books:

1. Everyday Cryptography, Fundamental Principles & Applications, Keith Martin, Oxford
2. Network Security & Cryptography, Bernard Menezes, Cengage, 2010

IV Year - I Semester	Code: 20AD7D07	L	T	P	C
		3	0	0	3

REINFORCEMENT LEARNING

Course Objectives:

- Learn various approaches to solve decision problems with functional models and algorithms for task formulation, Tabular based solutions, Function approximation solutions, policy gradients and model based reinforcement learning.

Course Outcomes:

By completing the course the students will be able to:

- Understand basic concepts of Reinforcement learning
- Identifying appropriate learning tasks for Reinforcement learning techniques
- Understand various methods and applications of reinforcement learning

UNIT I

Introduction: Reinforcement Learning, Examples, Elements of Reinforcement Learning, Limitations and Scope, An Extended Example: Tic-Tac-Toe

Multi-armed Bandits: A k-armed Bandit Problem, Action-value methods, The 10-armed Testbed, Incremental Implementation, Tracking a Nonstationary Problem, Optimistic Initial Values, Upper –Confidence-Bound Action Selection, Gradient Bandit Algorithm

UNIT II

Finite Markov Decision Process: The Agent-Environment Interface, Goals and Rewards, Returns and Episodes, Unified Notataion for Episodic and Continuing Tasks, Policies and Value Functions,

Dynamic Programming: Policy Evaluation, Policy Improvement, Policy Iteration, Value Iteration, Asynchronous Dynamic Programming, Generalized Policy Iteration, Efficiency of Dynamic Programming

UNIT III

Monte Carlo Methods: Monte Carlo Prediction, Monte Carlo Estimation of Action Values, Monte Carlo Control, Monte Carlo Control without Exploring Starts, Off-policy Prediction via Importance Sampling, Incremental Implementation, Discontinuing-aware Importance Sampling, Per-decision Importance Sampling

n*-step Bootstrapping:n*-step TD Prediction, *n*-step Sarsa, *n*-step Off-policy Learning, Per-decision methods with Control Variables, A Unifying Algorithm: *n*-step Q(σ)

UNIT IV

Off-policy Methods with Approximation: Semi-gradient Methods, Examples of Off-policy Divergence, The Deadly Triad, Linear Value-function Geometry, Gradient Descent in the Bellman Error, The Bellman Error is not Learnable, Gradient-TD methods, Emphatic-TD methods, Reducing Variance

Eligibility Traces: The λ-return, TD(λ), *n*-step Truncated λ-return methods, Online λ –return Algorithm, True Online TD(λ), Dutch Traces in Monte Carlo Learning, Sarsa(λ), Variable λ and γ, Off-policy Traces with Control Variables, Watkins's Q(λ) to Tree-Backup(λ)

UNIT V

Policy Gradient Methods: Policy Approximation and its Advantages, The Policy Gradient Theorem, REINFOECE: Monte Carlo Policy Gradient, REINFORCE with Baseline, Actor-Critic Methods, Policy Gradient for Continuing Problems, Policy Parameterization fr Continuous Actions

Applications and Case Studies:TD-Gammon, Samuel's Checkers Player, Watson's Daily Double Wagering, Optimizing Memory Control, Personalized Web Services

Text Books:

1. R. S. Sutton and A. G. Bart,. "Reinforcement Learning - An Introduction," MIT Press, 2018.

Reference Books:

1. Szepesvári, Csaba, "Algorithms for Reinforcement Learning," United States: Morgan & Claypool, 2010.
2. Puterman, Martin L., "Markov Decision Processes: Discrete Stochastic Dynamic Programming," Germany: Wiley, 2014.

IV Year - I Semester	Code: 20AD7D08	L	T	P	C
		3	0	0	3

SOCIAL MEDIA ANALYTICS

Course Objectives:

- Understand and deal with any social media network, strategy, or campaign.

Course Outcomes:

By completing the course the students will be able to:

- Understand social media categories and types of social media analytics
- Understand the impact of social media analytics integration with and affects other areas of business.

UNIT I

Introduction: Foundation for Analytics, Evolution of Data and the Digital Gap, Social Media Data Sources: Offline and Online, Definition of Social Media, Data Sources in Social Media Channels, Estimated vs. Factual Data Sources, Public and Private Data, Data Gathering in Social Media Analytics, Social Media Network Support of Data Collection, API: Application Programming Interface, Web Crawling or Scraping,

UNIT II

From Data to Insights: Example of a Single Metric Giving Actionable Insight, An Example of a Metric Leading to New Questions, Creating a Plan to Shape Data into Insights, The Planning Stage: Projecting Possible Insights, Analysis of a Social Media Post, The process of Comparison, Data Aggregation, Calculations and Display, Data Display, Social Media and Big Data, Potential Challenges

UNIT III

Analytics in Social Media: Types of Analytics in Social Media, Analytics or Channel Analytics, Social Media Listening: Keyword and Mention-Based Analysis, Demographics, Interests and Sentiment, Advertising Analytics: Focus on Conversions and ROI of Paid Social Media Campaigns, Conversions: The Key to Digital and Social Advertising, CMS Analytics: Measuring the Performance of the Content Management Team, CRM Analytics: Customer Support and Sales via Social Media

UNIT IV

Dedicated vs. Hybrid Tools : Common to all Tools, Dedicated Tools, Advantages of Dedicated Tools, Disadvantages of Dedicated tools, Hybrid Tools, Dedicated Tools with Hybrid Features, Advantages of Hybrid Tools, Disadvantages of Hybrid Tools, Data Integration Tools, Advantages of Data Integration Tools, Disadvantages of Data Integration Tools.

UNIT V

Social Network Landscape: Concept and UX on Social Networks, Features and Their Strategic Value, Interactivity: How Social is the Network, Content Flow on Social Network

The Analytics Process: Analysis is Comparison, Investigation beyond Social Analytics, Shaping a Method: The End Game for an Analyst, The Analysis Circle, Dynamic Cycles, The Analyst Mindset: Making the Right Questions and Running the Right Experiments

Text Books:

1.Alex Goncalves, “Social Media Analytics Strategy-Using Data to Optimize Business Performance,” Apress, 2017

Reference Books:

1. Qiu, Liangfei., Kumar, Subodha, “Social Media Analytics and Practical Applications: The Change to the Competition Landscape,” United States: CRC Press, 2021.
2. Sponder, Marshall, “Social Media Analytics: Effective Tools for Building, Interpreting, and Using Metrics,” United Kingdom: McGraw-Hill Education, 2011.

IV Year - I Semester	Code: 20CS7D18	L	T	P	C
		2	0	2	3

BLOCKCHAIN TECHNOLOGIES

Course Objectives:

By the end of the course, students will be able to

- Understand how block chain systems (mainly Bit coin and Ethereum) work and to securely interact with them,
- Design, build, and deploy smart contracts and distributed applications,
- Integrate ideas from block chain technology into their own projects.

Course Outcomes:

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

- Demonstrate the foundation of the Block chain technology and understand the processes in payment and funding.
- Identify the risks involved in building Block chain applications.
- Review of legal implications using smart contracts.
- Choose the present landscape of Blockchain implementations and Understand Crypto currency markets
- Examine how to profit from trading crypto currencies.

UNIT I

Introduction, Scenarios, Challenges Articulated, Blockchain, Blockchain Characteristics, Opportunities Using Blockchain, History of Blockchain. Evolution of Blockchain : Evolution of Computer Applications, Centralized Applications, Decentralized Applications, Stages in Blockchain Evolution, Consortia, Forks, Public Blockchain Environments, Type of Players in Blockchain Ecosystem, Players in Market.

UNIT II

Blockchain Concepts: Introduction, Changing of Blocks, Hashing, Merkle-Tree, Consensus, Mining and Finalizing Blocks, Currency aka tokens, security on blockchain, data storage on blockchain, wallets, coding on blockchain: smart contracts, peer-to-peer network, types of blockchain nodes, risk associated with blockchain solutions, life cycle of blockchain transaction.

UNIT III

Architecting Blockchain solutions: Introduction, Obstacles for Use of Blockchain, Blockchain Relevance Evaluation Framework, Blockchain Solutions Reference Architecture, Types of Blockchain Applications.

Cryptographic Tokens, Typical Solution Architecture for Enterprise Use Cases, Types of Blockchain Solutions, Architecture Considerations, Architecture with Blockchain Platforms, Approach for Designing Blockchain Applications.

UNIT IV

Ethereum Blockchain Implementation: Introduction, Tuna Fish Tracking Use Case, Ethereum Ecosystem, Ethereum Development, Ethereum Tool Stack, Ethereum Virtual Machine, Smart Contract Programming, Integrated Development Environment, Truffle Framework, Ganache, Unit Testing, Ethereum Accounts, MyEtherWallet, Ethereum Networks/Environments, Infura, Etherscan, Ethereum Clients, Decentralized Application, Metamask, Tuna Fish Use Case Implementation, OpenZeppelin Contracts

UNIT V

Hyperledger Blockchain Implementation, Introduction, Use Case – Car Ownership Tracking, Hyperledger Fabric, Hyperledger Fabric Transaction Flow, FabCar Use Case Implementation, Invoking Chaincode Functions Using Client Application.

Text Books:

1) Ambadas, Arshad Sarfarz Ariff, Sham “Blockchain for Enterprise Application Developers”, Wiley
2) Andreas M. Antonpoulos, “Mastering Bitcoin: Programming the Open Blockchain” , O’Reilly

Reference Books:

1) Blockchain: A Practical Guide to Developing Business, Law, and Technology Solutions, Joseph Bambara, Paul R. Allen, Mc Graw Hill.
2) Blockchain: Blueprint for a New Economy, Melanie Swan, O’Reilly

IV Year - I Semester	Code : 20CS7D13	L	T	P	C
		3	0	0	3

SOFTWARE TESTING METHODOLOGIES

Course Objectives:

1. To study the fundamental concepts of software testing which includes objectives, process, criteria, strategies, and methods.
2. To discuss various software testing types and levels of testing like black and white box testing along with levels unit test, integration, regression, and system testing.
3. It also helps to learn the types of bugs, testing levels with which the student can very well identify a bug and correct as when it happens.

Course Outcomes:

1. Know the basic concepts of software testing and its essentials.
2. Able to identify the various bugs and correcting them after knowing the consequences of the bug.
3. Use of program's control flow as a structural model is the corner stone of testing.
4. Performing functional testing using control flow and transaction flow graphs.

UNIT I

Introduction:-Purpose of testing, Dichotomies,model for testing, consequences of bugs, taxonomy of bugs, Flow graphs and Path testing:- Basics 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 interfaces 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

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 Techniques – SPD(Oreille)

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		3	0	0	3

COMPUTER VISION

Course Objectives:

To introduce students the fundamentals of image formation; To introduce students the major ideas, methods, and techniques of computer vision and pattern recognition; To develop an appreciation for various issues in the design of computer vision and object recognition systems; and To provide the student with programming experience from implementing computer vision and object recognition applications.

Course Outcomes:

After completing the course Student will be able to:

1. Identify basic concepts, terminology, theories, models and methods in the field of computer vision,
2. Describe known principles of feature detection and matching,
3. Describe basic methods of computer vision related to image stitching, photography like high dynamic range imaging and blur removal.
4. Suggest a design of a computer vision system for a 3D Reconstruction, Albedos, image based rendering views and depths.

UNIT I

Introduction: Image Formation: Geometric Primitives and Transformation, Photometric Image Formation, Digital Camera, Image Processing: Point Operators, Linear Filtering, More Neighborhood Operators

UNIT II

Feature Detection and Matching: Points and Patches, Edges, Lines, Segmentation: Active Contours, Split and Merge, Mean Shift and Mode Finding, Normalized Cuts, Feature-Based Alignment: 2D and 3D Feature-based Alignment, Pose Estimation, Geometric Intrinsic Calibration.

UNIT III

Structure and Motion: Triangular, Two-frame Structure from Motion, Factorization, Bundle Adjustment, Constrained Structure and Motion, Dense Motion Estimation: Translation Alignment, Parametric Motion, Spline-based Motion, Optical Flow, Layered motion

UNIT IV

Image Stitching: Motion Models, Global Alignment, Composing, Computational Photography: Photometric Calibration, High Dynamic Range Imaging, Super-Resolution and Blur Removal, image Matting and Compositing, Texture Analysis and Synthesis.

UNIT V

3D Reconstruction: Shape From X, Active Range Finding, Surface Representation, Point-based Representation, Volumetric Representation, Model-based Reconstruction, Recovering Texture Maps and Albedos, Image- based Rendering: View Interpolation, Layered Depth Images, Light Fields and Lumigraphs, Environment Mattes, Video-based Rendering.

Text Books:

1. Richard Szeliski, Computer Vision: Algorithms and Applications, Springer-Verlag London Limited, 2011.
2. Simon J.D Prince, Computer Vision: Models, Learning and Inference, 1st Edition, 2012.

Reference Books:

1. Computer Vision - A modern approach, by D. Forsyth and J. Ponce, Prentice Hall Robot Vision, by B. K. P. Horn, McGraw-Hill.
2. Haralick& Shapiro, “Computer and Robot Vision”, Vol II
3. G_erardMedioni and Sing Bing Kang “Emerging topics in computer vision”7

IV Year - I Semester	Code: 20CS7D11	L	T	P	C
		3	0	0	3

ADHOC AND SENSOR NETWORKS

Course Outcomes:

By the end of the course the student

- Able to think and develop new applications in Manets and WSN.
- Able to take any new technical issue related to these new thrust areas and come up with a solution(s).
- Able to develop algorithms/protocols for Manets and WSN.
- Understand the issues and solutions of various layers of Manets, namely MAC layer, Network Layer & Transport Layer in Manets and WSN.
- Understand the issues in *Security and Sensor Network and Tools.*

UNIT I

Introduction to Ad Hoc Networks:

Characteristics of MANETs, applications of MANETs, and challenges of MANETs. Routing in MANETs: Criteria for classification, Taxonomy of MANET routing algorithms, Topology based routing algorithms, Position based routing algorithms,

UNIT II

Data Transmission:

Broadcast storm problem, Broadcasting, Multicasting and Geo casting

UNIT III

TCP over Ad Hoc: TCP protocol overview, TCP and MANETs, and Solutions for TCP over Ad hoc networks.

UNIT IV

Basics of Wireless Sensors and Applications:

Applications, Classification of sensor networks, Architecture of sensor networks, Physical layer, MAC layer, Link layer.

UNIT V

Security:

Security in ad hoc networks, Key management, Secure routing, Cooperation in MANETs, and Intrusion detection systems.

Text Books:

1. Ad hoc and Sensor Networks - Theory and Applications, by Carlos Cordeiro and Dharma P. Agrawal, World Scientific Publications, March 2006, ISBN 981-256-681-3.
2. Wireless Sensor Networks: An Information Processing Approach, Feng Zhao, Leonidas Guibas, Elsevier Science ISBN: 978-1-55860-914-3, (Morgan Kauffman)

Reference Books:

1. Ad Hoc and Sensor Networks: Theory And Applications 2nd Edition, Kindle Edition
2. Security and Privacy in Ad-Hoc and Sensor Networks: Third European Workshop, ESAS 2006, Hamburg, Germany, September 20-21, 2006

IV Year - I Semester	Code: 20AD7D09	L	T	P	C
		3	0	0	3

NoSQL DATABASES

Course Objectives:

From the course the student will

- To understand the basic concepts and the applications of database systems. To master the basics of SQL and construct queries using SQL
- To understand the relational database design principles
- To become familiar with the basic issues of transaction processing and concurrency control
- To become familiar with database storage structures and access techniques

Course Outcomes:

After the completion of the course, student will be able to do the following

- Identify what type of NoSQL database to implement based on business requirements (key-value, document, full text, graph, etc.)
- Apply NoSQL data modeling from application specific queries
- Use Atomic Aggregates and denormalization as data modelling techniques to optimize query processing

UNIT I

Introduction to NoSQL: Definition And Introduction, Sorted Ordered Column-Oriented Stores, Key/Value Stores, Document Databases, Graph Databases, Examining Two Simple Examples, Location Preferences Store, Car Make And Model Database, Working With Language Bindings.

UNIT II

Interacting with NoSQL: If NoSql Then What, Language Bindings For NoSQL Data Stores, Performing Crud Operations, Creating Records, Accessing Data, Updating And Deleting Data.

UNIT III

NoSQL Storage Architecture: Working With Column-Oriented Databases, Hbase Distributed Storage Architecture, Document Store Internals, Understanding Key/Value Stores In Memcached And Redis, Eventually Consistent Non-Relational Databases.

UNIT IV

NoSQL Stores: Similarities Between Sql And Mongodb Query Features, Accessing Data From Column-Oriented Databases Like Hbase, Querying Redis Data Stores, Changing Document Databases, Schema Evolution In Column-Oriented Databases, Hbase Data Import And Export, Data Evolution In Key/Value Stores.

UNIT V

Indexing and Ordering Data Sets : Essential Concepts Behind A Database Index, Indexing And Ordering In Mongodb, Creating and Using Indexes In Mongodb, Indexing And Ordering In Couchdb, Indexing In Apache Cassandra.

Text Books:

1) Pramod Sadalage and Martin Fowler, NoSQL Distilled, Addison-Wesley Professional, 2012.
2) Dan McCreary and Ann Kelly, Making Sense of NoSQL, Manning Publications, 2013.

Reference Books:

1) Shashank Tiwari, Professional NoSQL, Wrox Press, Wiley, 2011, ISBN: 978-0-470-94224-6
2) Gaurav Vaish, Getting Started with NoSQL, Packt Publishing, 2013.

IV Year - I Semester	Code: 20AD7D10	L	T	P	C
		3	0	0	3

SOCIAL NETWORK ANALYSIS

Course Outcomes:

After completing the course student should:

- Know basic notation and terminology used in network science
- Be able to visualize, summarize and compare networks
- Illustrate basic principles behind network analysis algorithms
- Develop practical skills of network analysis in R programming language
- Be capable of analyzing real work networks

UNIT I

Social Network Analysis: Preliminaries and definitions, Erdos Number Project, Centrality measures, Balance and Homophily.

UNIT II

Random graph models**:** Random graphs and alternative models, Models of network growth, Navigationin social Networks, Cohesive subgroups, Multidimensional Scaling, Structural equivalence, roles and positions.

UNIT III

Network topology and diffusion, Contagion in Networks, Complex contagion, Perco Percolation and information, Navigation in Networks Revisited

UNIT IV

Small world experiments, small world models, origins of small world, Heavy tails, Small Diameter, Clustering of connectivity, The Erdos Renyi Model, Clustering Models

UNIT V

Network structure -Important vertices and page rank algorithm, towards rational dynamics in networks, basics of game theory, Coloring and consensus, biased voting, network formation games, network structure and equilibrium, behavioral experiments, Spatial and agent-based models

Text Books:

1. S.Wasserman and K.Faust.“Social Network Analysis:Methods and Applications” , Cambridge University Press
2.D.Easley and J.Kleinberg,“Networks,Crowds and Markets:Reasoningabou tahighly connected world” ,Cambridge UniversityPress,1st edition,2010

Reference Books:

1.Maarten van Steen.“Graph Theory and Complex Networks.An Introduction”,2010
2.Reza Zafarani,MohammedAliAbbasi,HuanLiu.“SocialMediaMining:AnIntroduction”.Cambridge University Press 2014
3.MaksimTsvetovat and Alexander Kouznetsov. “Social Network Analysis for Startups”. O’ReillyMedia,2011

IV Year - I Semester	Code: 20AD7D11	L	T	P	C
		3	0	0	3

RECOMMENDER SYSTEMS

Course Objectives:

To develop state-of-the-art recommender systems that automates a variety of choice-making strategies with the goal of providing affordable, personal, and high-quality recommendations

Course Outcomes:

By completing the course the students will be able to:

- Understand the basic concepts of recommender systems
- Carry out performance evaluation of recommender systems based on various metrics
- Implement machine-learning and data-mining algorithms in recommender systems data sets.
- Design and implement a simple recommender system.

UNIT I

An Introduction to Recommender Systems: Goals of Recommender Systems, Basic Models of Recommender Systems, Collaborative Filtering Models, Content-Based Recommender Systems, Knowledge-Based Recommender Systems, Domain-Specific Challenges in Recommender Systems, Advanced Topics and Applications.

UNIT II

Neighborhood-Based Collaborative Filtering: Key Properties of Ratings Matrices, Predicting Ratings with Neighborhood-Based Methods, Clustering and Neighborhood-Based Methods, Dimensionality Reduction and Neighborhood Methods, A Regression Modeling View of Neighborhood Methods, Graph Models for Neighborhood-Based Methods

UNIT III

Model-Based Collaborative Filtering: Decision and Regression Trees, Rule-Based Collaborative Filtering, Naïve Bayes Collaborative Filtering, Latent Factor Models, Integrating Factorization and Neighborhood Models

UNIT IV

Content-Based Recommender Systems: Basic Components of Content-Based Systems, Preprocessing and Feature Extraction, Learning User Profiles and Filtering, Content-Based Versus Collaborative Recommendations
Knowledge-Based Recommender Systems: Constraint-Based Recommender Systems, Case-Based Recommenders, Persistent Personalization in Knowledge-Based Systems.

UNIT V

Evaluating Recommender Systems: Evaluation Paradigms, General Goals of Evaluation Design, Design Issues in Offline Recommender Evaluation, Accuracy Metrics in Offline Evaluation, Limitations of Evaluation Measures

Text Books:

1. Charu .C. Aggarwal, Recommender Systems: The Textbook, Springer, 2016.
2. J. Leskovec, A. Rajaraman and J. Ullman, Mining of massive datasets, 2nd Ed., Cambridge, 2012

Reference Books:

1. Jannach D., Zanker M. and FelFering A., Recommender Systems: An Introduction, Cambridge University Press(2011), 1st ed.
2. Manouselis N., Drachsler H., Verbert K., Duval E., Recommender Systems For Learning, Springer (2013), 1st ed.

IV Year - I Semester	Code: 20AD7D12	L	T	P	C
		3	0	0	3

AI CHATBOTS

Course Objectives:

- Learn how artificial intelligence powers chatbots, get an overview of the bot ecosystem and bot anatomy, and study different types of bots and use cases.
- Identify best practices for defining a chatbot use case, and use a rapid prototyping framework to develop a use case for a personalized chatbot.

Course Outcomes:

- Develop an in-depth understanding of conversation design, including on boarding, flows, utterances, entities, and personality.
- Design, build, test, and iterate a fully-functional, interactive chatbot using a commercial platform.

Deploy the finished chatbot for public use and interaction

UNIT I

Introduction: Benefits from Chatbots for a Business, A Customer-Centric Approach in Financial Services, Chatbots in the Insurance Industry, Conversational Chatbot Landscape, Identifying the Sources of Data: Chatbot Conversations, Training Chatbots for Conversations, Personal Data in Chatbots, Introduction to the General Data Protection Regulation (GDPR)

UNIT II

Chatbot Development Essentials: Customer Service-Centric Chatbots, Chatbot Development Approaches, Rules-Based Approach, AI-Based Approach, Conversational Flow, Key Terms in Chatbots, Utterance, Intent, Entity, Channel, Human Takeover, Use Case: 24x7 Insurance Agent

UNIT III

Building a Chatbot Solution: Business Considerations, Chatbots Vs Apps, Growth of Messenger Applications, Direct Contact Vs Chat, Business Benefits of Chatbots, Success Metrics, Customer Satisfaction Index, Completion Rate, Bounce Rate, Managing Risks in Chatbots Service, Generic Solution Architecture for Private Chatbots

UNIT IV

Natural Language Processing, Understanding, and Generation: Chatbot Architecture, Popular Open Source NLP and NLU Tools, Natural Language Processing, Natural Language Understanding, Natural Language Generation, Applications

UNIT V

Introduction to Microsoft Bot, RASA, and Google Dialog flow: Microsoft Bot Framework, Introduction to QnA Maker, Introduction to LUIS, Introduction to RASA, RASA Core, RASA NLU, Introduction to Dialog flow

Chatbot Integration Mechanism: Integration with Third-Party APIs, Connecting to an Enterprise Data Store, Integration Module

Text Books:

1. Abhishek Singh, KarthikRamasubramanian, Shrey Shivam, “Building an Enterprise Chatbot: Work with Protected Enterprise Data Using Open Source Frameworks”, ISBN 978-1-4842-5034-1, Apress,2019

Reference Books:

1. Janarthanam and Srini, Hands-on chatbots and conversational UI development: Build chatbots and voice user interfaces with C (1 ed.), Packt Publishing Ltd, 2017. ISBN 978-1788294669.
2. Galitsky, Boris., Developing Enterprise Chatbots (1 ed.), Springer International Publishing, 2019. ISBN 978-303004298

IV Year - I Semester	Code: 20AD7D13	L	T	P	C
		3	0	0	3

DATA VISUALIZATION

Course Outcomes:

Upon completion of this course, the students will be able to

- Understand basics of Data Visualization
- Implement visualization of distributions
- Write programs on visualization of time series, proportions & associations
- Apply visualization on Trends and uncertainty
- Explain principles of proportions

UNIT I

INTRODUCTION TO VISUALIZATION: Visualizing Data-Mapping Data onto Aesthetics, Aesthetics and Types of Data, Scales Map Data Values onto Aesthetics, Coordinate Systems and Axes- Cartesian Coordinates, Nonlinear Axes, Coordinate Systems with Curved Axes, Color Scales-Color as a Tool to Distinguish, Color to Represent Data Values, Color as a Tool to Highlight, Directory of Visualizations- Amounts, Distributions, Proportions, x–y relationships, Geospatial Data

UNIT II

VISUALIZING DISTRIBUTIONS: Visualizing Amounts-Bar Plots, Grouped and Stacked Bars, Dot Plots and Heatmaps, Visualizing Distributions: Histograms and Density Plots- Visualizing a Single Distribution, Visualizing Multiple Distributions at the Same Time, Visualizing Distributions: Empirical Cumulative Distribution Functions and Q-Q Plots-Empirical Cumulative Distribution Functions, Highly Skewed Distributions, Quantile Plots, Visualizing Many Distributions at Once-Visualizing Distributions Along the VerticalAxis, Visualizing Distributions Along the Horizontal Axis

UNIT III

VISUALIZING ASSOCIATIONS & TIME SERIES: Visualizing Proportions-A Case for Pie Charts, A Case for Side-by-Side Bars, A Case for Stacked Bars and Stacked Densities, Visualizing Proportions Separately as Parts of the Total ,Visualizing Nested Proportions- Nested Proportions Gone Wrong, Mosaic Plots and Tree maps, Nested Pies ,Parallel Sets. Visualizing Associations Among Two or More Quantitative Variables-Scatter plots, Correlograms, Dimension Reduction, Paired Data. Visualizing Time Series and Other Functions of an Independent Variable-Individual Time Series , Multiple Time Series and Dose–Response Curves, Time Series of Twoor More Response Variables

UNIT IV

VISUALIZING UNCERTIANITY: Visualizing Trends-Smoothing, Showing Trends with a Defined Functional Form, Detrending and Time-Series Decomposition, Visualizing Geospatial Data-Projections, Layers, Choropleth Mapping, Cartograms, Visualizing Uncertainty-Framing Probabilities as Frequencies, Visualizing the Uncertainty of Point Estimates, Visualizing the Uncertainty of Curve Fits, Hypothetical Outcome Plots

UNIT V

PRINCIPLE OF PROPORTIONAL INK: The Principle of Proportional Ink-Visualizations Along Linear Axes, Visualizations Along Logarithmic Axes, Direct Area Visualizations, Handling Overlapping Points-Partial Transparency and Jittering, 2DHistograms, Contour Lines, Common Pitfalls of Color Use-Encoding Too Much or Irrelevant Information ,Using Non monotonic Color Scales to Encode Data Values, Not Designing for Color-Vision Deficiency

Text Books:

1. Claus Wilke, “Fundamentals of Data Visualization: A Primer on Making Informative and Compelling Figures”, 1st edition, O’Reilly Media Inc, 2019.
2. Ossama Embarak, Data Analysis and Visualization Using Python: Analyze Data to Create Visualizations for BI Systems, Apress, 2018

Reference Books:

1. Tony Fischetti, Brett Lantz, R: Data Analysis and Visualization, O’Reilly, 2016

IV Year - I Semester	Code: 20CS7E04	L	T	P	C
		3	0	0	3

NATURE INSPIRED COMPUTING TECHNIQUES

Course Objectives:
Learn the theoretical foundations of Nature Inspired Computing techniques, how they can be used to solve problems, and in which areas are most useful and effective.

Course Outcomes:
By completing the course the students will be able to:
- Understand the strengths, weaknesses and appropriateness of nature-inspired algorithms.
- Apply nature-inspired algorithms to optimization, design and learning problems.

UNIT I
Analysis of Algorithms: Analysis of Optimization Algorithms, Nature Inspired Algorithms, Parameter Tuning and Parameter Control: Parameter Tuning, Hyper optimization, Multi objective View, Parameter Control, Simulated Annealing: Algorithm, Basic Convergence Properties, Stochastic Tunneling

UNIT II
Genetic Algorithms: Introduction, Role of Genetic Operators, Choice of Parameters, GA Variants, **Differential Evolution:** Introduction, Differential Evolution, Variants, Choice of Parameters, Convergence Analysis, **Particle Swarm Optimization:** Swarm Intelligence, PSO Algorithm, Accelerated PSO, Binary PSO

UNIT III
Firefly Algorithms: Firefly Behavior, Standard Firefly Algorithm Variations of Light Intensity and Attractiveness, Controlling Randomization, Firefly Algorithms in Applications
Cuckoo Search: Cuckoo Breeding Behavior, Levy Flights, Cuckoo Search: Special Cases of Cuckoo Search, Variants of Cuckoo Search, Global Convergence, Applications

UNIT IV
Bat Algorithms: Echolocation of Bats: Behavior of Microbats, Acoustics of Echolocation, Bat Algorithms: Movement of Virtual Bats, Loudness and Pulse Emission, Binary Bat Algorithm, Variants of the Bat Algorithm, Convergence Analysis, Applications: Continuous Optimization, Combinatorial Optimization and Scheduling, Inverse Problems and Parameter Estimation, Classifications, Clustering and Data Mining, Image Processing, Fuzzy Logic and Other Applications

UNIT V
Flower Pollination Algorithms: Introduction, Characteristics of Flower Pollination, Flower Pollination Algorithms, Multi-Objective Flower Pollination Algorithms, Validation and Numerical Experiments: Single-Objective Test Functions, Multi-Objective Test Functions, Applications: Single-Objective Design Benchmarks, Multi-Objective Design Benchmarks

Text Books:
1. "Nature-Inspired Optimization Algorithms", Yang, Xin-She, Elsevier Science, 2014.

Reference Books:
1. "Nature-Inspired Computing and Optimization: Theory and Applications," Germany: Springer International Publishing, 2017.

IV Year - I Semester	Code: 20CS7E05	L	T	P	C
		3	0	0	3

SECURE CODING TECHNIQUES

Course Outcomes:

At the end of the Course, student will be able to:

- Differentiate the objectives of information security
- Understand the trend, reasons and impact of the recent Cyber attacks
- Understand OWASP design principles while designing a web application
- Understand Threat modelling
- Importance of security in all phases of SDLC
- Write secure coding using some of the practices in C/C++/Java and Python programming languages

UNIT I

Network and Information security Fundamentals: Network Basics, Network Components, Network Types, Network Communication Types, Introduction to Networking Models, Cyber Security Objectives and Services, Other Terms of Cyber Security, Myths Around Cyber Security, Myths Around Cyber Security, Recent Cyber Attacks, Generic Conclusion about Attacks, Why and What is Cyber Security, Categories of Attack

UNIT II

Introduction to Cyber security: Introduction to OWASP Top 10, A1 Injection, A1 Injection Risks Root Causes and its Mitigation, A1 Injection, A2 Broken Authentication and Session Management, A7 Cross Site Scripting XSS,A3 Sensitive Data Exposure, A5 Broken Access Control, A4 XML External Entity (XEE), A6 Security Misconfiguration, A7 Missing Function Level Access Control, A8 Cross Site Request Forgery CSRF, A8 Insecure Deserialization, A9 Using Components With Known Vulnerabilities, A10 Unvalidated Redirects and Forwards, A10 Insufficient Logging and Monitoring, Secure Coding Practices, Secure Design Principles, Threat Modeling, Microsoft SDL Tool

UNIT III

Secure coding practices and OWASP Top 10: Declarative Security, Programmatic Security, Concurrency, Configuration, Cryptography, Input and Output Sanitization, Error Handling, Input Validation, Logging and auditing, Session Management, Exception Management, Safe APIs, Type Safety, Memory Management, Tokenizing, Sandboxing, Static and dynamic testing, vulnerability scanning and penetration testing

UNIT IV

Secure coding practices in C/C++ and Java: Potential Software Risks in C/C++, Defensive coding, Preventative Planning, Clean Code, Iterative Design, Assertions, Pre Post Conditions, Low level design inspections, Unit Tests

Java- Managing Denial of Service, Securing Information, Data Integrity, Accessibility and Extensibility, Securing Objects, Serialization Security

UNIT V

Secure coding in Python: Interactive Python Scripting, Python Variables, Conditionals, Loops, Functions, External Modules, File operations, Web requests

Text Books:

1. Networking Fundamentals, 2019 edition, Packt, Author: Gordon Davies
2. Principles of Information Security, Authors: Michael E. Whitman and Herbert J. Mattord, Course technology incorp.
3. CSSLP SECURE SOFTWARE LIFECYCLE PROFESSIONAL ALL-IN-ONE EXAM GUIDE, Third Edition, 3rd Edition, Authors: Wm. Arthur Conklin, Daniel Paul Shoemaker, Released February 2022,Publisher(s): McGraw-Hill,ISBN: 9781264258215
4. OCP Oracle Certified Professional Java SE 11 Programmer II Study Guide: Exam 1Z0-816 and Exam 1Z0-817 Paperback – 6 August 2020, Authors: Scott Selikoff , Jeanne Boyarsky
5. OWASP 2017 Handbook,

https://owasp.org/www-pdf-archive/OWASP_Top_10_2017_RC2_Final.pdf

Web Reference :

1.https://www.stealthlabs.com/blog/infographic-top-15-cybersecurity- myths-vs-reality/
2. https://microage.ca/cybersecurity-layering-approach/
3.https://www.synopsys.com/glossary/what-is-threat-modeling.html#:~:text=Threat%20modeling%20is%20a%20structured,An%20abstraction%20of%20the%20system

RESOURCES MANAGEMENT

Course Code:20HS7E01 (IV-I)

Elective-1

L	T	P	C
4	0	0	3

Course Objectives:

COB 1: To make the students understand the importance of resources management and proper planning to effective utilization of resources in organization.

COB 2: To make the students understands the role of human relations in the management of operations and to Understands the marketing conditions, techniques for better business career.

COB 3: To impart knowledge on conceptual models of resources management and to familiarize with the tools of project management.

Course Outcomes:

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

CO 1:	Explain the concepts and importance of resources management
CO 2	Use Human resource management techniques for optimum utilization Human Resource.
CO 3:	Estimate Material Requirement of organization through applications of it.
CO 4:	Apply statistical quality techniques to know quality ofproduct with in the control limits
CO 5 :	Apply the project management techniques to decide the optimum time and cost for the project completion

Unit- I

Introduction to resources Management: Conceptdefinition to Management-types of recourse-advantages and importance of resources management-optimization process of resources -Evaluation of organizational resources-Environmental Scanning-Establishment strategic advantage profile in resources.

Unit-2

Human Resources Management; Concept of HRM& HRD-Functions of HRM; job analysis , job description ,man power planning, selection, job evaluation and Merit rating – Marketing function-channels of distribution –product life cycle.

Unit -3

ManagementofMaterial Resources: Introduction-importance-functions-economic orderquantity(EOQ)-sorting methods; ABC,HML,SDE,VED FSN analysis-contemporary methods (JIT, MRP,TQM,SIX SIGMAS,BPO).

Unit-4

Management of Operational resources;Concept-Principals-work study-method study-Statistical quality control(R- chart, C- chart, P-chart) Accepting sampling

Unit-5

Project Management; Introduction - importance- historical background PERT-Network analysis- rules of networking-critical path method-time estimations-project crashing (simple problems),

Text Books:

1. Dr. A.R.Aryasri, Management Science, TMH, 4th edition, 2009
2. P. Vijaya kumar, N. Appa Rao, AB. Chhalill, Introduction to ManagemantScience,Cengage Learning India pvt ltd., Delhi.
3. O.P .Kanna,**Industrial Engineering And Management,Dhanpat Rai Publications(2010)**
4. Kootz&O'Donnell , Principles of management.

Reference Books:

1. Koontz &weihrich – Essentials of management, TMH, 8 th edition, 2010
2. Stoner, Freeman, Gilbert, Management, 6th edition Pearson education, New Delhi.
3. R S Dwivedi, Human resource Management,Vikas Publishing House Pvt,ltd.,
4.Philip Kotler, K L keller, A koshy, M Jha, Marketing Management, 13Edition, Pearson
5. Pandey, Management Science, Standard Book

BONAM VENKATA CHALAMAYYA ENGINERING COLLEGE
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ODALAREVU – 533 210, Andhra Pradesh, India

L	T	P	C
3	0	0	3

INDUSTRIAL MANAGEMENT

Course Code:-20HS7E02
IVYEAR I SEMESTER

Elective-2

Course Objectives:

COB 1: To impart fundamental knowledge and skill sets required in the Industrial Management and Engineering profession, which include the ability to apply basic knowledge of mathematics, probability and statistics, and the domain knowledge of Industrial Management and Engineering

COB 2: To produce graduates with the ability to adopt a system approach to design, develop, implement and innovate integrated systems that include people, materials, information, equipment and energy.

COB 3: To enable students to understand the interactions between engineering, business, technological and environmental spheres in the modern society.

COB 4: To enable students to understand their role as engineers and their impact to society at the national and global context.

Course Outcomes:

CO1: Able to **describe** concept of industrial engg and management and functions of management

CO2: Able to **contrast** the location factors of plants and different layouts used of an industry.

CO3. Able to **understand** work study , methods study and work measurement for improving productivity .

CO4. Able to **interpret** the SQC tools and TQM approach for improving the product quality.

CO5. Able to **apply** concept of Value engg and project management using CPM and PERT

UNIT – I

INTRODUCTION: Definition of industrial engineering (I.E), development, applications, role of an industrialengineer, Productivity and its measurement.

Concepts of management, importance, functions of management, Taylor's scientific managementprinciples,Fayol's principles of management , Mc Douglas Theory X and theory

UNIT – II

PLANT LAYOUT: Factors governing plant location, types of production layouts, advantages and disadvantagesof process layout and product layout, applications, quantitative techniques for optimal design of layouts, plant maintenance, preventive and breakdown maintenance.

UNIT – III

OPERATIONS MANAGEMENT:

production and its methods with applications. work study - method study- process charts and diagrams , micro-motion study and Therbligs.Work measurement – Stop Watch Time study, work sampling, PMTS, rating techniques.Principles of Ergonomics.

UNIT – IV

STATISTICAL QUALITY CONTROL: quality, quality control and SQC. inspection and its methods -

single and double sampling .Control charts for variables and attributes -$\bar{X}$ and R charts, P charts, C charts S charts and numerical examples.

TOTAL QUALITY MANAGEMENT: zero defect concept, quality circles, implementation, applications, six sigma – definition, basic concepts, ISOquality systems.

UNIT – V

PROJECT MANAGEMENT:

PERT and CPM – differences & applications, critical path, determination of floats,importance, project crashing, smoothing and numerical examples.

TEXT BOOKS:

1. Industrial Engineering and management / O.P Khanna/Khanna Publishers.

2. Industrial Engineering and Production Management/MartandTelsang/S.Chand& Company Ltd. New Delhi

Reference Books:

1. Industrial Management / Bhattacharya DK/Vikas publishers
2. Operations Management / J.G Monks/McGrawHill Publishers.
3. Industrial Engineering and Management Science/ T. R. Banga, S. C. Sharma, N. K. Agarwal/Khanna Publishers
4. Principles of Management /Koontz O' Donnel/McGraw Hill Publishers.
5. Statistical Quality Control /Gupta/Khanna Publishers
6. Industrial Engineering and Management /NVS Raju/Cengage Publishers

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ODALAREVU – 533 210, Andhra Pradesh, India

MANAGEMENT SCIENCE
Elective-3

Course Code: 20HS7E03(IV-I semester)	**L**	**T**	**P**	**C**
	4	**0**	**0**	**3**

Course Objectives:

COB 1: To make the students define the principles, functions, theories and practices of different management areas with a systematic and critical understanding of organizational structures.

COB 2: To make the students understands the role of human relations in the management of operations and to Understands the marketing conditions, techniques for better business career.

COB 3: To impart knowledge on conceptual models of strategic management and to familiarize with the tools of project management.

Course Outcomes:

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

CO 1:	Explain and infer the concepts and aspects of management
CO 2:	Apply statistical quality & inventory control techniques to know, quality of product with in the control limits
CO 3	Use Human resource management techniques for better people management.
CO 4:	Estimate Marketing and its applications.
CO 5:	Apply the project management techniques to decide the optimum time and cost for the project completion
CO 6 :	Analyzing Strategies which are suitable for the development of organization

Unit I: Introduction to Management:

Definition, Nature, Importance of Management, Functions of Management –

Evaluation of Management thought Taylor's scientific management theory, Fayol's principles of management, Contribution of Elton mayo, Theories of Motivation Maslow, Herzberg, Douglas MC Gregor.

Basic concepts of Organization-Authority, Responsibility, Delegation of Authority, Span of control, centralization Vs Decentralization, formal Vs informal organizations.

Organization structures - Line organization, Line and staff organization, Functional organization, Committee organization, Matrix organization, Decision making process.

Unit II: - Operations & Materials, Quality Control Management

Plant location, Factors influencing location, Principles and types of plant layouts,

Material Management: Need for Inventory control, EOQ, ABC analysis (simple problems) and Types of ABC analysis.

Statistical Quality Control:

Statistical Quality Control, acceptance sampling, Control charts P-chart, X chart, R-chart, and C-chart Simple problems, TQM, Six Sigma, JIT, KPO.

Unit III: - Human Resource& Marketing Management:

Concepts of HRM, HRD, Basic functions of HR manager, Recruitment, Selection, Training, performance appraisal, Talent management - Stress management. Marketing Managementand its Marketing mix-Market segmentation - product life cycle- Channels of Distribution.

Unit IV: - Project Management:

Network analysis: Networking rules - Critical path method (CPM) - Programme evaluation and review technique (PERT), project crashing (simple problems

Unit V: Strategic Management:

Vision, Mission, Goals, Strategy, Elements of Corporate Planning Process, Environmental Scanning (SWOT analysis), Steps in Strategy Formulation and Implementation,

Text Books:

1. Dr. A.R.Aryasri, Management Science, TMH, 4th edition, 2009
2. P. Vijaya kumar, N. Appa Rao, AB. Chhalill, Introduction to Managemant Science,Cengage Learning India pvt ltd., Delhi.
3. O.P .Kanna, Industrial Engineering And Management, Dhanpat Rai Publications (2010)
4. Kootz & O'Donnell , Principles of management.

Reference Books:

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2. Stoner, Freeman, Gilbert, Management, 6th edition Pearson education, New Delhi.
3. R S Dwivedi , Human resource Management,Vikas Publishing House Pvt,ltd.,
4.Philip Kotler, K L keller, A koshy, M Jha, Marketing Management, 13Edition, Pearson
5. Pandey, Management Science, Standard Book

IPR & PATENTS

IV Year I Semester Subject Code:20HS7E04

UNIT I

Introduction to Intellectual Property Rights (IPR): Concept of Property - ntroduction to IPR International Instruments and IPR - WIPO-TRIPS-WTO-Laws Relating to IPR - IPR Tool Kit- Protection and Regulation - Copyrights and Neighboring Rights Industrial Property Patents- Agencies for IPR Registration - Traditional Knowledge-Emerging Areas of IPR Layout Designs and Integrated Circuits - Use and Misuse of Intellectual Property Rights.

UNIT II

Copyrights and Neighboring Rights: Introduction to Copyrights - Principles of Copyright Protection Law Relating to Copyrights - Subject Matters of Copyright Copyright Ownership Transfer and Duration - Right to Prepare Derivative Works-Rights of Distribution - Rights of Performers-Copyright Registration-Limitations-Infringement of Copyright-Relief and Remedy -Case Law - Semiconductor Chip Protection Act.

UNIT III

Patents: Introduction to Patents - Laws Relating to Patents in India - Patent Requirements - Product Patent and Process Patent - Patent Search - Patent Registration and Granting of Patent - Exclusive Rights-Limitations - Ownership and Transfer-Revocation of Patent-Patent Appellate Board - Infringement of Patent-Compulsory Licensing Patent Cooperation Treaty - New developments in Patents Software Protection and Computer related Innovations

UNIT IV

Trademarks: Introduction to Trademarks- Laws Relating to Trademarks - Functions of Trademark- Distinction between Trademark and Property Mark-Marks Covered under Trademark Law - Trade Mark Registration - Trade Mark Maintenance Transfer of rights-Deceptive Similarities Likelihood of Confusion - Dilution of Ownership-Trademarks Claims and Infringement-Remedies-Passing Off Action.

UNIT V

Trade Secrets & Cyber Law and Cyber Crime: Introduction to Trade Secrets-General Principles -Laws Relating to Trade Secrets- Maintaining Trade Secret Physical Security - Employee Access Limitation-Employee Confidentiality Agreements Breach of Contract-Law of Unfair Competition Trade Secret Litigation Applying State Law. Cyber Law-Information Technology Act 2000-Protection of Online and Computer Transactions- E-commerce-Data Security-Authentication and Confidentiality - Privacy Digital Signatures -Certifying Authorities - Cyber Crimes - Prevention and Punishment-Liability of Network Providers

Text Books:-

1) Deborah E.Bouchoux: Intellectual Property, Cengage Learning, NewDelhi
2) Kompal Bansal &Parishit Bansal Fundamentals of IPR for Engineers, B. S. Publications (Press).

References:

1) Intellectual Property Rights (Patents & Cyber Law), Dr. A. Srinivas. Oxford University Press,New Delhi.
2)PrabhuddhaGanguli: Intellectual Property Rights, Tata Mc-Graw-Hill, New Delhi

ENGLISH FOR EMPLOYABILITY

(Common to all branches)

Course Code : 20HS7S01	L	T	P	C
	1	0	2	2

Course Objectives:

COB 1: Imbibe the ability to understand and interpret unspoken gestures from others.
COB 2: To present the point of view effectively and support the arguments of the topic
COB 3: Learn to speak and interrupt politely by concluding with a positive discussion.
COB. 4: Design a presentation structurally evolved with a content and organizing points.
COB. 5: To describe academic credentials exhibited by a coherent manner.
COB 6: To grow up the confidence of learners to make them fitful for the questions they encountered.

Course Outcomes:

At the end of the Course, Student will be able to:

CO.1. Recognize the way how body language functions in communicative and non-communicative domains. (BT-2 – Understand)
CO 2. Make use of effective delivery strategies to select compile and synthesize information for an oral presentations. (BT – 5 (Evaluation)
CO. 3.Demonstrate in Mock Interviews, Mock Discussion and Public Speaking. (BT 3 (Application)
CO.4. Identify communicative competency to respond to others in different situations. (BT.1 Remember)
CO. 5. Develop the writing skills to meet the organizational objectives (BT.6 – Create)
CO. 6. Asses the potentialities of learners to meet with future endeavors. (BT. 5 – Evaluate)

PRACTICE 1:
BODY LANGUAGE
PRACTICE 2:
DEBATING
PRACTICE 3:
GROUP DISCUSSION
PRACTICE 4:
PRESENTATION SKILLS
PRACTICE 5:
RESUME / CV WRITING
PRACTICE 6:
INTERVEIW SKILLS

Prescribed Text Books: Interact English Lab Manual for Undergraduate Students by Orient Black Swan Pvt. Ltd. Publishers

Reference Books:

1. Strengthen your Communication Skills by Dr.M.Hari Prasad, Dr.Salivendra J.Raju and Dr.G.Suvarna Lakshmi, Maruthi Publications.
2. English for Professionals by Prof Eliah, B.S Publications, Hyderabad.
3. A practical Course in effective English speaking skills, PHI
4. Spring Board to Success, Orient Black Swan
5. Cornerstone, developing soft skills, Pearson Education.