



Course Structure and Syllabus

B.Tech (CSE-Data Science)

(IV Year)

**Department of Computer Science and
Engineering**

ANURAG UNIVERSITY

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B.Tech. CSE - Data Science (DS)

B.TECH IV YEAR I SEM (7th Semester)
5 T +2 L + Mini project

Serial No	Course Code	Category	Course Title	Hours per week			Credits
				L	T	P	
1	A57054	HSS&MC	Managerial Economics and Financial Analysis	2	1	0	3
2	A57056	PCC	Deep Learning	3	1	0	4
3	A57055	PEC-III	1. Cryptography and Information Security	3	1	0	4
	A57066		1. Big Data Analytics				
	A57058		2. Software Testing				
4	A57061	PEC - IV	1. Natural Language Processing	3	0	0	3
	A57062		2. Web Mining				
	A57064		3. Human Computer Interaction				
	A57067		1. Data Science and Analytics				
5	A57060	PEC-V	1. Fundamentals of Cloud Computing	3	0	0	3
	A57065		2. Fundamentals of Blockchain Technology				
	A57063		3. Cyber Forensics				
6	A57210	PCC	Deep Learning Lab	0	0	3	1.5
7	A57209	PEC-III- Lab	1. Cryptography and Information Security Lab	0	0	3	1.5
	A57214		2. Big Data Analytics Lab				
	A57212		3. Software Testing Lab				
8	A57230	PROJ	Industry Oriented Mini Project	0	0	4	2
Total							22

B.TECH IV YEAR II SEM**2T +3 L/P**

Serial No	Course Code	Category	Course Title	Hours per week			Credits
				L	T	P	
1	A58001	OEC-II	1.Technical and Business Communication Skills	2	1	0	3
	A58019		2.Digital Media Literacy				
	A58010		3.Value Engineering				
2	A58005	OEC-III	1.Negotiation Skills	2	1	0	3
	A58008		2.Project Management				
	A58021		3.Stress Management				
3	A58201	PROJ	Seminar	0	0	4	2
4	A58202	PROJ	Comprehensive Viva-Voce	0	0	0	2
5	A58203	PROJ	Project	0	0	20	10
Total							20

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	2	1/0	3

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS (HSS&MC)

Course Objectives:

The objective of this course is to familiarize the student with the concepts of managerial economics and financial accounting, demand and cost concepts, market structures, pricing and financial ratios

Course Outcomes:

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

1. Describe the concept of demand and its determinants in managerial decisions
2. Know the cost concepts and breakeven analysis in production
3. Identify various market structures and different pricing strategies
4. Have knowledge of capital budgeting techniques in financial decisions
5. Have knowledge of Ratios in solving of business problems

Unit-I

Introduction to Managerial Economics: Definition, nature and scope of managerial economics, demand analysis- demand determinants, Law of Demand and its exceptions.

Elasticity of Demand: Definition, types, measurement and significance of elasticity of demand. demand forecasting, methods of demand forecasting.

Unit-II

Theory of Production and Cost Analysis: Production Function – Isoquants and Iso costs, MRTS, Least Cost Combination of Inputs.

Cost Analysis: Cost concepts, Opportunity cost, Breakeven Analysis (BEA) – determination of breakeven point, managerial significance and limitations of BEA.

Unit –III

Market structures: Types of competition, features of perfect competition, monopoly and monopolistic competition, price - output determination in perfect competition

Objectives and Policies of Pricing: objectives of pricing, methods of pricing - cost plus pricing, marginal cost pricing, going rate pricing, limit pricing, market skimming pricing, penetration pricing, two - part pricing, block pricing, peak load pricing, cross subsidization.

Unit –IV

Capital and Capital Budgeting: Capital and its significance. Types of capital. estimation of fixed and working capital requirements. Methods and sources of raising finance. Nature and scope of capital budgeting, features of capital budgeting proposals. Methods of capital Budgeting: Payback Method. Accounting Rate of Return (ARR) and Net Present Value Method

Unit –V

Introduction to Financial Accounting: Definition of Accounting, Double-Entry Book Keeping, Journal, Ledger, and Trial Balance, Final Accounts.

Ratio Analysis: Computation, Analysis and Interpretation of Liquidity Ratios Activity Capital Structure Ratios and Profitability Ratios.

TEXT BOOKS:

1. Arya Sri: Managerial Economics and Financial Analysis, TMH,2009
2. Varshney&Maheswari: Managerial Economics, Sultan Chand, 2014

REFERENCES:

1. R. K. Sharma & Shashi K Gupta, Financial Management, Kalyani Publishers, 2020
2. V. Rajasekaran & R. Lalitha, Financial Accounting, Pearson Education, 2010.
3. Domnick Salvatore, Managerial Economics in a Global Economy, 9e, Oxford Univ Press, 2018.
4. S N Maheshwari, CA Sharad K Maheshwari & Dr Suneel K Maheshwari, Financial Accounting, 6/e, Vikas Publications, 2018

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	3	1/0	4

DEEP LEARNING

(PCC)

Prerequisites:

Basic Mathematics, P&S, Python, Machine Learning

Course Objectives:

1. To advance in training techniques for neural networks
2. To understand various CNN Architectures
3. To understand various RNN Methodologies
4. To custom train Autoencoder Models and implement them.
5. To apply Transfer Learning to solve problems

Course outcomes:

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

1. Have a good understanding of the fundamental issues and basics of deep learning
2. Understand the concept of CNN to apply it in the Image classification problems
3. Learning and understanding the working of various RNN methods
4. Learning and understanding the working of various Autoencoders methods
5. Use Transfer Learning to solve problems with high dimensional data including image and speech

UNIT I :

Deep Learning: Fundamentals, Introduction, Building Block of Neural Networks, Layers, MLPs, Forward pass, backward pass, class, trainer and optimizer, The Vanishing and Exploding Gradient Problems, Difficulties in Convergence, Local and Spurious Optima, Preprocessing, Momentum, learning rate Decay, Weight Initialization, Regularization, Dropout, SoftMax, Cross Entropy loss function, Activation Functions

UNIT II:

CNN: Introduction, striding and padding, pooling layers, structure, operations and prediction of CNN with layers, CNN -Case study with MNIST, CNN VS Fully Connected

UNIT III:

RNN: Handling Branches, Layers, Nodes, Essential Elements-Vanilla RNNs, GRUs, LSTM

UNIT IV:

Autoencoders: Denoising Autoencoders, Sparse Autoencoders, Deep Autoencoders, Variational Autoencoders, GANS

UNIT V:

Transfer Learning- Types, Methodologies, Diving into Transfer Learning, Challenges

Text Books:

1. Seth Weidman, "Deep Learning from Scratch", O'Reilly Media, Inc., 2019
2. Ian Goodfellow, Yoshua Bengio and Aaron Courville, "Deep Learning" , MIT Press, 2015
3. Dipanjan Sarkar, Raghav Bali, "Transfer Learning in Action", Manning Publications, 2021

Reference Books:

1. Giancarlo Zaccone, Md. Rezaul Karim, Ahmed Menshawy "Deep Learning with TensorFlow: Explore neural networks with Python", Packt Publisher, 2017.
2. Antonio Gulli, Sujit Pal, "Deep Learning with Keras", Packt Publishers, 2017.
3. Francois Chollet, "Deep Learning with Python", Manning Publications, 2017.

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L	T/P	C
3	1/0	4

CRYPTOGRAPHY AND INFORMATION SECURITY (PEC-III)

Prerequisites:

Fundamentals of Networking, Mathematical Fundamentals

Course Objectives

1. Understand fundamentals of cryptography and classic encryption techniques.
2. Compare and analyze encryption Algorithms
3. Summarize Authentication Functions using MAC and Hash
4. Analyze security importance of various web Applications
5. Categorize various types of Intruders and Viruses

Course Outcomes

1. Assess fundamentals of cryptography and classic encryption techniques.
2. Compare various encryption Algorithms.
3. Summarize authentication functions using MAC and Hash
4. Outline security importance of various web applications.
5. Categorize various types of intruders and viruses.

Unit I:

Security Concepts: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security Cryptography Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques symmetric and asymmetric key cryptography, steganography.

Unit II :

Symmetric key Ciphers: DES structure, DES Analysis, Security of DES, variants of DES, Block cipher modes of operation , AES structure, Analysis of AES , Key distribution

Asymmetric key Ciphers: Principles of public key cryptosystems, RSA algorithm, Analysis of RSA, Diffie-Hellman Key exchange.

Unit III:

Message Authentication and Hash Functions: Authentication requirements and functions, MAC and Hash Functions, MAC Algorithms: Secure Hash Algorithm, Whirlpool, HMAC, Digital signatures, X.509, Kerberos.

Unit IV

Security at layers (Network, Transport, Application): IPSec, Secure Socket Layer(SSL), Transport Layer Security(TLS), Secure Electronic Transaction(SET), Pretty Good Privacy(PGP), S/MIME.

Unit V

Intruders, Virus and Firewalls: Intruders, Intrusion detection, password management, Virus and related threats, Countermeasures, Firewall design principles, Types of firewalls.

Text Books:

1. B.Forouzan, Cryptography and Network Security, Tata McGraw-Hill.
2. William Stallings, Cryptography and Network Security, Pearson Education, 4th Edition

Reference Books:

1. C K Shyamala, N Harini, Dr T R Padmanabhan, Cryptography and Network Security : Wiley India, 1st Edition.
2. Bernard Menezes, Network Security and Cryptography: CENGAGE Learning
3. AtulKahate, Cryptography and Network Security: McGraw Hill, 2nd Edition

Reference Links:

1. <http://www.cs.iit.edu/~cs549/cs549s07/lectures.htm>
<http://williamstallings.com/Extras/Security-Notes/>
2. <http://williamstallings.com/NetworkSecurity/styled/>

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	3	1/0	4

BIG DATA ANALYTICS (PEC-III)

Course Objectives:

1. Discuss the overview of big data analytics concepts and growth rate
2. Introduce the tools required to manage and analyze big data like Hadoop, NoSQL Data Management.
3. Summarize the fundamental concepts of Hadoop Distributed file systems
4. Describe the techniques involved with Map Reduce Applications.
5. Analyze various recommender systems for applications

Course Outcomes:

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

1. Appraise the concept and application of Big Data
2. Apply scalable algorithms on NO SQL for big data analytics.
3. Elaborate the notion of Hadoop Distributed File System and applications
4. Apply MapReduce for the given problem
5. Implement recommender systems for different application

Unit-I

Introduction To Big Data: Characteristics of Big Data, Traits of Big data, Challenges of Conventional Systems, Sources of Big Data, Applications of big data, Features and benefits of big data, Analysis vs Reporting, CAP theorem, Modern Data Analytic Tools.

Introduction to Hadoop Programming languages: Pig, Hive.

NOSQL Databases: Cassandra, Mongo, HBase.

Unit-II

NOSQL Data Management: Introduction to NoSQL, aggregate data models, aggregates, key-value and document data Models, relationships, graph databases, schema less databases, materialized views, distribution models, sharding, master-slave replication, peer-peer replication, sharing and replication

Unit –III

Introduction To Hadoop: History of Hadoop, Data Storage and Analysis, Hadoop – Setup, Hadoop operation modes, Configurations of Hadoop. Hadoop Ecosystem, Hadoop Distributed File System, HDFS Architecture, concepts of Blocks in HDFS Architecture, Name Nodes and Data Nodes, using command Line Interface with HDFS, HDFS Commands, Features of HDFS.

Unit –IV

MapReduce Applications: MapReduce workflows, unit tests with MR Unit, test data and local tests, anatomy of MapReduce job run, classic Map-reduce, YARN, failures in classic MapReduce and YARN, job scheduling, shuffle and sort, task execution, MapReduce types, input formats, output formats

Unit –V

Social Media Analytics and Text Mining: Introducing social media; Key elements of social media; Sentiment Analysis, Performing Social Media Analytics.

TEXT BOOKS:

1. BIG DATA- Black Book, Dream Tech Press, 2019.

REFERENCES:

1. Seema Acharya, S. Chellappan, "Big Data and Analytics", Wiley, 2014
2. Tom White "Hadoop: The Definitive Guide" 4th Edition, O'Reilly Media, 2015.
3. Michael Minelli, Michele Chambers, Ambiga Dhiraj, Jim Stogdill, "Big Data Big Analytics:
Emerging Business Intelligence and Analytic Trends for Today's Businesses", 1st Edition, Wiley Publications, 2013
4. Chris Eaton, Dirk De Roos, Tom Deutsch, George Lapis, Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data", McGraw Hill Publishing, 2012
5. Pete Warden, "Big Data Glossary", O'Reilly, 2011.

SOFTWARE TESTING

(PEC-III)

Course Objectives:

1. To gain knowledge on testing in software development life-cycle, software testing process levels and testing terminologies
2. To learn techniques and algorithms for test case design
3. To understand various issues involved with applying test criteria during software development
4. To comprehend how to develop the many testing criteria to be applied with a variety of technologies.

Course Outcomes:

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

1. Understand Software Testing terminology, various activities of Test Engineer and Test coverage criteria
2. Design Test cases from graphs
3. Design Test cases from logical expressions
4. Design Test cases from partitions of the input space and syntax
5. Test Object-Oriented and Web Application Softwares

Unit – I

Activities of a Test Engineer: Testing Levels Based on Software Activity, Beizer's Testing Levels Based on Test Process, Maturity Automation of Test Activities, Software Testing Limitations and Terminology, Coverage Criteria for Testing: Infeasibility and Subsumption, Characteristics of a Good Coverage Criterion, Older Software Testing Terminology

Unit – II

Graph Coverage: Graph Coverage: Graph Coverage Criteria, Graph Coverage for Source Code, Graph Coverage for Design Elements, Graph Coverage for Specifications, Graph Coverage for Use Cases, Representing Graphs Algebraically

Unit – III

Logic Coverage: Logic Predicates and Clauses, Logic Expression Coverage Criteria: Active Clause Coverage, Inactive Clause Coverage, Infeasibility and Subsumption, Making a Clause Determine a Predicate, Finding Satisfying Values. Structural Logic Coverage of Programs, Specification-Based Logic Coverage, Logic Coverage of Finite State Machines, Disjunctive Normal Form Criteria

Unit – IV

Input Space Partitioning: Input Domain Modeling, Combination Strategies Criteria, Constraints among Partitions

Syntax-Based Testing: Syntax-Based Coverage Criteria, Program-Based Grammars, Integration and Object-Oriented Testing, Specification-Based Grammars, Input Space Grammars

Unit – V

Practical Considerations: Regression Testing, Integration and Testing, Test Process, Test Plans, Identifying Correct Outputs

Engineering Criteria for Technologies: Testing Object-Oriented Software, Testing Web Applications and Web Services, Testing Graphical User Interfaces, Real-Time Software and Embedded Software

Text Books

1. Paul Ammann and Jeff Offutt, Introduction to Software Testing, Cambridge University Press, 2008.
2. Software Testing techniques - Boris Beizer, Second Edition, Dreamtech Press
3. Software Testing Tools – Dr.K.V.K.K. Prasad, Dreamtech Press

Reference Books

1. Glenford J. Myers, The Art of Software Testing, Second edition, 2008.
2. Paul C. Jorgensen, Software Testing: A Craftsman's Approach, Fourth edition, CRC Press, 2014.
3. Lisa Crispin and Janet Gregory, Agile Testing: A Practical Guide for Testers and Agile Teams, Addison-Wesley, 2009.

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3	0	3

NATURAL LANGUAGE PROCESSING

(PEC-IV)

Pre-requisites:

Artificial Intelligence, Machine Learning, Python Programming

Course Objectives:

1. To learn the fundamentals of Natural Language Processing
2. To understand the semantic aspects and similarity measures
3. To understand the aspects of context-free grammar and perform parsing
4. To understand and identify different word senses and find their relationship
5. To apply the NLP techniques in understanding discourses

Course Outcomes:

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

1. Solve problems involving regular expressions and N grams
2. Evaluate Vector models
3. Perform parsing operations
4. Build and analyze applications with semantic roles involving selectional restrictions
5. Utilize NLP learning algorithms in understanding a discourse

UNIT I:

REGULAR EXPRESSIONS AND N-GRAM MODELS

Regular Expressions - Regular Expressions, Corpora, Text Normalization, Minimum Edit Distance

Ngram Models - Ngrams, Evaluating Language models, Generalization, Smoothing

UNIT II :

Lexical Semantics, Vector semantics, Words and Vectors, Cosine for measuring similarity, TF-IDF, PMI
Visualising Embeddings, Semantic Properties of Embeddings, Bias and Embeddings

UNIT III :

Constituency Grammar - Constituency, Context free grammar, Grammar Rules for English, Treebanks, Grammar Equivalence and Normal Form, Lexicalised Grammar
Parsing - Ambiguity, CKY Parsing

UNIT IV:

WORD SENSES AND SEMANTIC ROLE

Word senses, Relation between senses, WordNet, Word Sense Disambiguation
Semantic Roles, Diathesis alternations, Problems with thematic roles, Proposition Bank, FrameNet, Semantic Role Labelling, Selectional Restrictions

UNIT V :

COREFERENCE RESOLUTION AND DISCOURSE COHERENCE

Coreference Resolution - Coreference Phenomena, coreference Tasks and datasets, Architecture of coreference algorithm, Gender bias in coreference
Discourse Coherence - Coherence Relation, Discourse Structure Parsing, Centering and Entity based Coherence, Representation model for local coherence, Global coherence

Text Books:

1. Daniel Jurafsky, James H. Martin, "Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech", Pearson Publication, 2014.
2. Steven Bird, Ewan Klein and Edward Loper, "Natural Language Processing with Python", First Edition, OReilly Media, 2009

Reference Books:

1. James Allen, "Natural Language Understanding", 2nd Edition, Benjamin, Cummings publishing company, 1995.
2. Rajesh Arumugam, Rajalingappaa Shanmugamani, "Hands-On Natural Language Processing with Python" , Packt Publishing Ltd., 2018
3. Deepti Chopra, Nisheeth Joshi, Iti Mathur "Mastering Natural Language Processing with Python" First Edition, Packt Publishing, 2016

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	3	0	3

WEB MINING

(PEC-IV)

Pre-requisites:

Probability & Statistics, Basics of Internet Knowledge

Course Objectives:

1. To describe web mining and understand the need for web mining.
2. Differentiate between Web mining and data mining
3. Understand the different methods to introduce structure to web-based data.
4. To understand how information is retrieved from Social media & WWW

Course Outcome:

By the end of the course, Student will be able to:

1. Identify the difference between Web mining & Data Mining.
2. Learn the methods of data extraction and Processing.
3. Learn the social network data mining.
4. Understand the concepts of Information Retrieval System from Web.
5. Do text processing, Language Processing.

Unit-I:

Introduction: A brief history of web and hypertext data, Topic directories, clustering and classification.

Web data extraction and processing: Web crawling and indexing, Hyperlink analysis, resources discovery and vertical portals. Structured and unstructured data mining.

Unit-II:

Infrastructure: Crawling the web: HTML,HTTP Basics, engineering large- scale crawlers.

DNS Catching, Perfecting and resolutions.

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Multiple current fetches: Multithreading, Link extraction and Normalization.Txt repository.Similarity and clustering

Unit-III:

Mining social network data: Social Network Analysis, Information propagation in social network, Community discovery in social networks, expert finding in social networks, Link prediction in social networks. **Mining user generated contents:** The Social Web, Mining micro blogging data, Mining social tagging data.

Unit-IV:

Information Retrieval: Basic Concepts of Information Retrieval, Information Retrieval Methods – Boolean Model, Vector Space Model and Statistical Language Model, Relevance Feedback, Evaluation Measures, Text and Web Page Preprocessing – Stopword Removal, Stemming, Web Page Preprocessing, Duplicate Detection, Inverted Index and Its Compression – Inverted Index, Search using Inverted Index, Index Construction, Index Compression, Latent Semantic Indexing – Singular Value Decomposition.

Unit-V:

Opinion Mining: motivation and problem definition, Research issues on Opinion Mining, Natural Language Processing, Text processing and Opinion Mining resources.

Opinion Mining – Sentiment Classification – Classification based on Sentiment Phrases, Classification Using Text Classification Methods, Feature based Opinion Mining and Summarization – Problem Definition, Object feature extraction.

Text Books:

1. Soumen Chakrabarti,“Mining the Web: Discovering Knowledge from Hypertext Data” Second edition, Morgan Kauffmann.
2. Bing Liu“ Web Data Mining: Exploring hyperlinks, contents and usage data “ , Springer
Second Edition.

Reference Books:

1. “Mining the Social Web” by Mathew A. Russell, Mikhail Klassen” 3rd Edition, O Reilly publication.
2. “Mining the World Wide Web: An Information Search Approach.” by Chang, G., Healey, M. J., McHugh, J. A. M., Wang, J. T. L. Kluwer Academic Publishers.
3. “Web mining: Applications & Techniques” by Antony Scime.

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HUMAN COMPUTER INTERACTION

(PEC-IV)

Prerequisites:

Web Technologies

Unit – I

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

Unit – II

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, and understanding business functions.

Unit – III

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

Unit – IV

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

Unit – V

Software tools – Specification methods, interface – Building Tools. Interaction Devices – Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

Text Books

1. The essential guide to user interface design: Wilbert O Galitz, Wiley Dreama Tech 2007
2. Designing the user interface design: Ben Shneiderman 3rd Edition, Pearson Education Asia 2001

Suggested / Reference Books

1. Human – Computer Interaction. ALAN DIX, JANET FINCAY, GRE GORYD, ABOWD, RUSSELL BEALG, PEARSON.
2. Interaction Design PRECE, ROGERS, SHARPS. Wiley Dreamtech,

Other Resources

1. <http://courses.iicm.tugraz.at/hci/hci.pdf>
2. <http://www.prenhall.com/behindthebook/0132240858/pdf>
3. <http://ebookfile.com/pdf/Zz2/human-computer-interaction-sample-exam-questions.pdf>
4. <http://nptel.ac.in/courses.php?disciplineId=106>

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3	0	3

DATA SCIENCE AND ANALYTICS (PEC-IV)

Prerequisites:

Basic Mathematics, Machine Learning and Data Visualization

Course Objectives:

1. To gain a foundational understanding of data science.
2. To understand the data science process and significance of exploratory data analysis (EDA).
3. To develop scoring and ranking Systems.
4. To understand the Handling Large Data on a single computer.
5. To understand the Text mining and text analytics.

Course Outcomes:

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

1. Describe what Data Science is and the skill sets needed to be a data scientist.
2. Analyze the data science process and significance of exploratory data analysis (EDA)
3. Apply the scoring and ranking systems for datasets.
4. Apply basic algorithms for Handling Large Data.
5. Interprets Text mining and text analytics.

Unit I:

Introduction

Computer Science, Data Science, and Real Science, Asking Interesting Questions from Data:The Baseball Encyclopedia the Internet Movie Database (IMDb) Google Ngrams, New York Taxi Records

Properties of Data: Structured vs. Unstructured Data, Quantitative vs. Categorical Data, Big Data vs. Little Data **Classification and Regression, Data Science Television:** The Quant Shop, Kaggle Challenges About the War Stories, **War Story:** Answering the Right Question

Unit II:

Data Munging

Languages for Data Science: The Importance of Notebook Environments, Standard Data Formats **Collecting Data:** Hunting, Scraping, Logging

Cleaning Data: Errors vs. Artifacts. Data Compatibility, Dealing with Missing Values, Outlier

War Story: Beating the Market Crowd sourcing: The Penny Demo, when is the Crowd Wise, Mechanisms for Aggregation, Crowd sourcing Services, Gamification

Exploratory data analysis: Build the models

Unit III:

Scores and Rankings

The Body Mass Index (BMI), **Developing Scoring Systems:** Gold Standards and Proxies, Scores vs. Rankings, Recognizing Good Scoring Functions, Z-scores and Normalization

Advanced Ranking Techniques: Elo Rankings, Merging Rankings, Digraph-based Rankings, PageRank

War Story: Clyde's Revenge, Arrow's Impossibility Theorem, War Story: Who's Bigger

Unit IV:

Handling Large Data on a single computer

Problems when handling large data, **General techniques for handling large data:** Choosing the right algorithm, Choosing the right data structure, Selecting the right tools

General programming tips for dealing with large data sets: Don't reinvent the wheel, Get the most of your hardware, reduce your computing needs, **Case study:** Predicting Malicious Urls, Building a recommender system inside a database

Unit V:

Text mining and Analytics

Text mining in the real world, Text mining techniques: Bag of words, Stemming and Lemmatization, Decision tree Classifier.

Case Study- Classifying Reddit Posts: Research Goal, data retrieval, data preparation, data exploration, data analysis, presentation and automation

Text Books:

1. Skiena, Steven S, The Data Science Design Manual, CRC press
2. Introducing Data Science, Davy Cielen, Arno D. B. Meysman, Mohamed Ali, Manning Publications Co., 1st edition, 2016.

Reference Books:

1. Pang-Ning Tan, Michael Steinbach, Anuj Karpatne, Vipin Kumar, Introduction to Data Mining (Second Edition)
2. V.K. Jain, Data Science and Analytics (with Python, R and SPSS Programming), Khanna Book Publishing Company.
3. Trevor Hastie, Robert Tibshirani and Jerome Friedman. Elements of Statistical Learning, Second Edition. ISBN 0387952845. 2009.
4. Jiawei Han, Micheline Kamber and Jian Pei. Data Mining: Concepts and Techniques, Third Edition. ISBN 0123814790. 2011.
5. Data Science from Scratch: First Principles with Python, Joel Grus, O'Reilly, 1st edition, 2015.

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	3	0	3

FUNDAMENTALS OF CLOUD COMPUTING (PEC-V)

Prerequisites:

Computer Organization and Computer Networks.

Course Objectives:

1. This course provides an insight into cloud computing

Course Outcomes:

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

1. Understand different Computing Paradigms and Virtualization
2. Learn the fundamentals of Cloud Computing.
3. Understand various service delivery models of a cloud computing architecture.
4. Demonstrate the ways in which the cloud can be programmed and deployed
5. Identify applications that can deploy on a Cloud environment.

UNIT-I

Computing Paradigms: High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing

Virtualization: Introduction to Virtualization, Approaches in Virtualization, Hypervisor and Its Role, Types of Virtualization

UNIT-II

Cloud Computing Fundamentals: Motivation for Cloud Computing, Defining Cloud Computing, 5-4-3 Principles of Cloud computing, Cloud Ecosystem, Requirements for Cloud Services.

UNIT-III

Cloud Computing Architecture and Management: Cloud architecture, Layer, Anatomy of the Cloud, Network Connectivity in Cloud Computing, Applications on the Cloud, Managing the Cloud, Migrating Application to Cloud.

UNIT-IV

Cloud Deployment Models: Private cloud, Public Cloud, Community Cloud, Hybrid Cloud.

Cloud Service Models: Infrastructure as a Service, Platform as a Service, Software as a Service.

UNIT-V

Cloud Service Providers: EMC, Google, Amazon Web Services, Microsoft, Windows Azure, IBM, Cloud Models, IBM, Sales force.

Open-Source Support for Cloud: Open-Source Tools for IaaS, Open-Source Tools for PaaS, Open-Source Tools for SaaS.

TEXT BOOKS:

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

REFERENCES:

1. Cloud Computing: Principles and Paradigms by Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, Wiley, 2011.
2. Distributed and Cloud Computing, Kai Hwang, Geoffery C. Fox, Jack J. Dongarra, Elsevier, 2012.
3. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Kumaraswamy, Shahed Latif, O'Reilly, SPD, rp 2011.

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FUNDAMENTALS OF BLOCKCHAIN TECHNOLOGY (PEC-V)

Pre-Requisites:

Object Oriented Programming Through Java, Basic Knowledge Of Computer Security, Data Structures

Course Objectives:

1. Identify different components and types of Blockchain.
2. Learn Smart Contracts for public Blockchain
3. Apply Ethereum tool for Deploying the Smart Contract
4. Interpret Private Blockchain System
5. Analyse the impact of Blockchain in business

Course Outcomes:

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

1. Summarize types and applications of Blockchain
2. Understand Smart Contracts for Public Blockchain System
3. Illustrate the design and deployment of smart contract through Ethereum
4. Apply Private Blockchain System in different Networks
5. Categorize different Business Applications of Blockchain

UNIT I:

Fundamentals of Blockchain: Origin of Blockchain, Blockchain Solution, Components of Blockchain, Block in a Blockchain, The Technology and the Future.

Blockchain Types and Consensus Mechanism: Decentralization and Distribution, Types of Blockchain, Consensus Protocol

UNIT II:

Blockchain, Ethereum Blockchain

Smart Contracts: Smart Contract, Characteristics of a Smart Contract

Ethereum Solidity: Introduction, Datatype, operator, enum, arrays, loops

UNIT III:

Ethereum Solidity: Mapping, Structure, State Modifiers, Exception Handling in Solidity, Inheritance, Compile and Deploy the Smart Contract. Introduction to Truffle IDE and metamask.

UNIT IV:

Private Blockchain System: Key Characteristics of Private Blockchain, Why We Need

Private Blockchain, Private Blockchain Examples, Private Blockchain and Open Source, E-commerce Site Example, Various Commands (Instructions) in E-commerce Blockchain, Smart Contract in Private Environment, State Machine, Different Algorithms of Permissioned Blockchain, Byzantine Fault, Multichain.

UNIT V:

Application of Blockchain: Blockchain in Banking and Finance, Blockchain in

Education, Blockchain in Energy, Blockchain in Healthcare, Blockchain in Real-estate, Blockchain in Supply Chain, The Blockchain and IoT.

Limitations and Challenges of Blockchain: Blockchain Implementation – Limitations, Blockchain Implementation – Challenges

Text Books:

1. Josh Thompson, 'Blockchain: The Blockchain for Beginnings, Guild to Blockchain Technology and Blockchain Programming', Create Space Independent Publishing Platform, 2017
2. Blockchain Technology: Chandramouli Subramanian, Asha A George, Abhilash K A and Meena Karthikeyan, Published by University Press

Reference Books

1. Mastering Bitcoin: Unlocking Digital Cryptocurrencies, by Andreas Antonopoulos
Blockchain by Melanie Swa, O'Reilly
2. Philipp Hacker, Ioannis Lianos (2019). Regulating Blockchain: Techno-Social and Legal Challenges, OUP Oxford. (ISBN-13: 978-0198842187).

Reference Link

1. Zero to Blockchain - An IBM Redbooks course, by Bob Dill, David Smits - <https://www.redbooks.ibm.com/Redbooks.nsf/RedbookAbstracts/crse0401.html>

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CYBER FORENSICS

(PEC-V)

Course Objectives:

1. Create a document review, retention, and destruction policy.
2. Write an acceptable use policy and employer privacy statement.
3. List and describe the generally accepted computer forensic procedures.
4. Explain and list the various legislation and regulations that impact technology.
5. Analyze forensic analysis reports

Course Outcomes:

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

1. Perform a forensic investigation by following guidelines to secure the crime or corporate scene.
2. Learn what legal issues are involved and what rights the person of interest has.
3. Perform digitally and court approved images of evidence to be used in a court of law.
4. Learn how to document and store evidence.
5. Learn how to analyze evidence using commercial forensic software and also how to create a report of the said evidence.

UNIT-I

Computer Forensics and Investigations: What is computer Forensics? Use of computer forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceeding, Computer Forensics services, Benefits of Professional

Forensics Methodology, Steps taken by Computer Forensics Specialists.

Types of Computer Forensics Technology: Types of Military Computer Forensic Technology, Types of law Enforcement-Computer forensic Technology.

UNIT-II

Computer Forensics Evidence and capture: Data Recovery Defined Data Backup and Recovery, The Role of Back-up in Data Recovery, The Data Recovery Solution

Evidence Collection and Data Seizure: Why Collection Evidence? Collection Options, Obstacles, Types of Evidence, The Rules of Evidence, General Procedure, Collection and Archiving, Methods of Collection, Artifacts, Collection Steps.

UNIT-III

Controlling Communication: The Chain of Custody duplication and Preservation of Digit

Evidence: Preserving the Digital Crime Scene, Computer Evidence Processing Steps, Legal Aspects of Collection and Preserving Computer Forensics Evidence.

Computer Image Verification and Authentication: Special Needs of Evidential Authentication

Computer Forensics analysis and validation: Determining what data to collect and analyze, validating forensic data, addressing data-hiding techniques, performing remote acquisitions

UNIT-IV

Network Forensics: Network forensics overview, performing live acquisitions, developing standard procedures for network forensics using network tools.

Processing Crime and Incident Scenes: Identifying Digital Evidence, Collecting the Evidence in Private-Sector Incident Scenes, Processing law Enforcement Crime Scenes,

Preparing for a Search, securing a Computer Incident or Crime Scene, Storing Digital evidence, obtaining a Digital Hash.

UNIT-V

E-mail Investigations: Exploring the Role of E-mail in Investigations, Exploring the Role of Client and Server in E-mail, Investigating Email Crimes and Violations, Understanding Email Servers, Using Specialized Email Forensics Tools,

Mobile Device Forensics: Understanding Mobile Device Forensics, Understanding Acquisition Procedure for Cell Phones and Mobile Devices

TEXT BOOKS:

1. John R.Vacca, Computer Forensics, Computer Crime Investigation, firewall Media, New Delhi,2005
2. Nelson, Phillips Enfinger, Steuart, Computer Forensics and Investigations, Cengage Learning.2009

REFERENCES:

1. Keith J. Jones, Richard Bejthich, Curtis W Rose, Real Digital Forensics, AdditionWesley Pearson Education.2006
2. Tony Sammesand Bairn Jenkinson, Forensic Compiling A Practitioner's Guide, Springer International edition.2013 Christopher L.T.Brown, Computer Evidence Collection & Presentation, Firewall Media.2005

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Deep Learning Lab (PCC- LAB)

Prerequisites:

DM, P&S, Python, AI, ML

List of Programs:

1. Implementation of Linear Regression
2. Deep learning Packages Basics: TensorFlow, Keras and PyTorch
3. Implementation of Neural network
4. Face recognition using CNN
5. Sentiment Analysis using LSTM
6. Language Modeling using RNN
7. Sentiment Analysis using GRU
8. Image Classification with Transfer Learning

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CRYPTOGRAPHY AND INFORMATION SECURITY LAB (PEC-III LAB)

Course Outcomes

By the completion of the course, Students will be able to:

1. Implement port Scanning
2. Investigate Security of Network
3. Analyze Packet Protocols ,IP Spoofing
4. Implement Various Encryption Algorithms
5. Implement Brute Force Algorithm

Week 1

1. Installation of NetCat.

Week2

2. Implement port scanning with NetCat

Week 3

3. Perform the following using NetCat
 - Banner Grabbing .
 - Chat Interface
 - File Transfer

Week 4

4. Installation of Network Miner

Week 5

5. Perform an experiment to sniff packets and IPs using Network

Week 6

6. Perform Sniffing of Web Browser User-Agents.

Week 7

7. Implement Simple Data Encryption Standard (SDES) Algorithm through C program

Week 8, 9

8. Implement Diffie–Hellman key exchange algorithm through C program.

Week 10

9. Installation of cryptool 2

Week 11

10. Implement DES algorithm using cryptool 2

Week 12

11. Implement RSA algorithm using cryptool 2

Week 13

12. Implement HASH algorithm using cryptool 2

Week 14

13. Implement SHA1 algorithm using crpty tool 2

Week 15

14. Implement brute force algorithm in C.

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BIG DATA ANALYTICS LAB (PEC-III LAB)

Course Outcomes:

At the end of this Big Data Analytics Lab course, students will be able to:

1. Develop various programs in Hadoop.
2. Perform file operation in HDFS
3. Perform query operation using pig
4. Practice various commands in HIVE
5. Create applications for Big Data analytics

List of Experiments:

Week 1

Downloading and installing Hadoop; Understanding different Hadoop modes. Start-up scripts, Configuration files.

Week2

Implement the following file management tasks in Hadoop:

1. Adding files and directories
2. Retrieving files
3. Deleting files

Week 3

Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm.

1. Find the number of occurrences of each word appearing in the input file(s)
2. Performing a Map Reduce Job for word search count (look for specific keywords in a file)

Week 4

Stop word elimination problem: Input:

1. A large textual file containing one sentence per line
2. A small file containing a set of stop words (One stop word per line) Output: A textual file containing the same sentences of the large input file without the words appearing in the small file.

Week 5

Write a Map Reduce program that mines weather data. Weather sensors collecting data every hour at many locations across the globe gather large volumes of log data, which is a good candidate for analysis with MapReduce, since it is semi structured and record oriented. Data available at: <https://github.com/tomwhite/hadoopbook/tree/master/input/ncdc/all>.

1. Find average, max and min temperature for each year in the NCDC data set?
2. Filter the readings of a set based on the value of the measurement, Output the line of input files associated with a temperature value greater than 30.0 and store it in a separate file.

Week 6

Implement of Matrix Multiplication with Hadoop Map Reduce

Week 7

Command line interface with HDFS

Week 8

Install and Run Pig then write Pig Latin scripts to sort, group, join, project, and filter your data.

Week 9

PIG Programs:

1. Run the Pig Latin Scripts to find Word Count
2. Run the Pig Latin Scripts to find a max temp for each and every year.

Week 10

Installation of Hive along with practice examples.

Week 11

Use Hive to create, alter, and drop databases, tables, views, functions, and indexes.

Week 12

Write a Pig script for:

1. DML operations on Cassandra Database.
2. Retrieving data from MongoDB.

Week 13

HBase Shell Commands practice

Week 14

Data analytics on Amazon food dataset, find all the pairs of items frequently reviewed together.

1. Transposes the original Amazon food dataset, obtaining a PairRDD of the type:
<user_id> → <list of the product_ids reviewed by user_id>
2. Counts the frequencies of all the pairs of products reviewed together;
3. Writes on the output folder all the pairs of products that appear more than once and their frequencies. The pairs of products must be sorted by frequency.

Note: The above experiments are for indicative purposes only. However, the concerned faculty member can add a few more experiments in addition to the existing. In such cases the concerned faculty member should get the syllabus approved by the BoS.

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SOFTWARE TESTING LAB (PEC-III LAB)

Prerequisites:

Data Structure, Object Oriented Programming, Web technologies

Course Objectives:

1. Manual testing using functional test
2. White box test case design based on path ,data, and logic
3. Explore Regression and Integration testing
4. Testing of Object-Oriented and Web Applications Softwares

Course Outcomes:

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

1. Performed Manual testing based on test cases
2. Design and execute Test cases of Path and Data coverage Criteria
3. Design and execute Test cases of Data and Logic coverage Criteria
4. Performed Regression and integration Testing
5. Testing Object-Oriented and Web Applications Software

List of Programs:

Week 1

Write functional test cases of ATM and perform manual testing to find faults and failures

Week2

Design and execute Edge and Node coverage Test cases of Student grade Assignment computer program

Week 3

Design and implement a program that will compute all paths (edge and Node) in a graph, it will be to accept a graph as input by reading a list of nodes, initial nodes, final nodes, and edges.

Week 4

Write Program to Reducing Graphs to Path Expressions of give Control Flow graph

Write Program to Find Maximum and Minimum number of test cases of give Control Flow graph

Week 5

Design and execute all du path test cases of Pattern matching of two strings

Week 6

Design and execute complete set of coupling du-pairs of compute the quadratic root for two numbers

Week 7

Design and execute Predicate coverage (PC) and Clause coverage (CC) Test cases of Quadratic program

Week 8

Design and execute Combinatorial coverage (CoC) Correlated active clause coverage
Test cases of Quadratic program

Week 9

Design and execute Data partition based test case of Quadratic program

Week 10

Demonstrate Java mutation tool

Week 11

Demonstrate the Regression and Integration testing

Week 12

Demonstrate and execute all Object-Oriented Testing Criteria

Week 13-14

Demonstrate and execute all web application Testing Criteria

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TECHNICAL AND BUSINESS COMMUNICATION SKILLS

(OEC-II)

Introduction

The course is intended to expose the students to learn and practice the five communication skills thinking, listening, speaking reading, and writing in English, the global language of communication. It reflects some of the approaches in English language teaching and learning currently in practice around the world.

Objective

To help the students to develop effective communication skills in all communicative contexts for professional advancement

Course Outcomes

On successful completion of the course, students will be able to

1. communicate technical and business correspondence
2. reflect on the themes discussed
3. recognize ethical implications of technical communication in professional contexts
4. identify the contemporary issues in engineering from environmental, societal, economic, and global perspectives
5. demonstrate ethical decisions in complex situations

UNIT-I

E-World & E-Communication:

E-language - E-governance - E-commerce/E-business - E-banking - E-waste

UNIT-II

Business Establishment & Infrastructure Development:

Power Supply - Industrial Park - Business Correspondence: Follow-up letters - Acceptance & Rejections - Persuasive letters - Resignation letters

UNIT-III

Technology and Society:

Robot Soldiers - For a Snapshot of a Web - Placing an order - Proposal Writing - Patents & Rights (National & International) - Intellectual Property - Nanotechnology

UNIT-IV

Ethics in Business Communication:

Ethical issues involved in Business Communication - Ethical dilemmas facing managers - Ethical Code & Communication - Standards in Daily Life - Total Quality Management - World University Ranking

UNIT-V

Management Information System:

Corporate Governance - Business Process Outsourcing - Project Management Communication - Marketing Communication

Textbook:

1. Dhanavel, P. S. *English and Communication Skills for Students of Science and Engineering*. Orient Black Swan. 2009.

References:

1. Anderson, V. Paul. *Technical Communication*. Cengage. 2014.
2. Kalkar, Anjali. et.al. *Business Communication*. Orient Black Swan. 2010.
3. Knisely, W. Charles. and Knisely, I. Karin. *Engineering Communication*. Cengage. 2015.
4. Kumar, Sanjay. and PushpLata. *Language and Communication skills for Engineers*. Oxford University Press. 2018.
5. Raman, Meenakshi and Singh, Prakash. *Business Communication*. (Second Edition.). Oxford University Press. 2012.

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DIGITAL MEDIA LITERACY (OEC-II)

Introduction

The course is introduced to build a relationship between media Literacy to traditional forms. It will enable the students understand the media around them and learn to use media literacy effectively. The students can also excel their writing skills through media.

Learning Objectives

The students will be able to

1. prepare the students to use media source and its content
2. train the students become media literate
3. provide practical tips for incorporating media literacy into the traditional curriculum

Course Outcomes

After the completion of the course, the students will

1. Use media as a learning tool
2. Share knowledge in digital media
3. Apply the use of persuasive language
4. Exhibit copy writing skills
5. Contribute their ideas through blogs

Prescribed Textbook:

Jacobs , Hayes Heidi. **Media Literacy**. Solution Tree Press: USA.

(E-book is available to download)

UNIT-I

Introduction – Diversity and Media:

Bias in the Media - Peer Driven Social Learning Communities - Social Learning Spaces
-Mirrored Learning Words - Online Events - The Nitty - Gritties

UNIT-II

Digital Literacy in Action:

Internet Safety and Filtering - Establish Proficiency of Tagging

UNIT-III

Blogging:

Basics of Blog Writing - Foundations of Blogging - Blogs as Professional Development
Tool -Blogs as a Learning Tool - Creating Knowledge Habitats

UNIT-IV

The Classroom:

A Market place for Learning - Build an Electronic Calendar-Paper less News Paper -
Marketing through Social Media - Writing Techniques

UNIT-V

Gaming as a Literacy:

How Video games promote Learning? - Participatory Culture and Engagement -
Collaboration and Cooperation - Motivation

References:

1. Hobbs Renee R. Create To Learn: Introduction To Digital Literacy:Wiley-Blackwell Publications.
2. Frank, W. Baker. Media Literacy in the K-12 Classroom. (2nd Edition.). Paperback Publications.
3. Hertz, Mary. Beth. Digital and Media Literacy in the Age of the Internet: Practical Classroom Applications. Rowman & Littlefield Publishers.
4. Hobbs Renee R. Digital and Media Literacy. Sage Publications.
5. Potter, W. James. Introduction to Media Literacy. Sage Publications.

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VALUE ENGINEERING (OE-II)

Course Objectives

The course is designed to help the student understand the concepts of Value engineering, understand different phases of value engineering and decision alternatives, and teams.

Course Outcomes

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

1. Understand the importance of value engineering concepts in productivity
2. Identify the different phases of value engineering projects
3. Know the different decision alternatives and choose the best alternative for optimization
4. Identify the value engineering concept in non-hardware projects and programmes
5. Analyze the value engineering teams with the help of case study.

Unit-I

Introduction: Value engineering concepts, advantages, applications, problem recognition, and role in productivity, criteria for comparison, element of choice. Level of value engineering in the organization, unique and quantitative evaluation of ideas.

Unit-II

Value Engineering and Job Plan: Introduction, orientation, information phase, speculation phase analysis phase. Selection and Evaluation of value engineering projects, Project selection, methods selection, value standards, application of value engineering methodology

Unit-III

Value Engineering Techniques: Selecting Products and Operation for Value Engineering action, Value Engineering Programmes, Decision Making for Optimum Alternative, Use of Decision Matrix, Make or Buy, Measuring Profits, Reporting Results, Follow up, Use of advanced technique like Function Analysis System.

Unit-IV

Versatility Of Value Engineering: Value engineering operation in maintenance and repair activities, Value Engineering in non-Hardware Projects. Initiating a Value Engineering Programme

Unit-V

Value Engineering Level of Effort: Value Engineering Team, Co-coordinator, Designer, different Services, Construction Management Contracts, Value Engineering Case Studies.

TEXT BOOKS:

1. Anil Kumar Mukhopadhyaya, "Value Engineering: Concepts Techniques and applications", SAGE Publications 2010.
2. Del L. Younker, "Value Engineering analysis and methodology", Marcel Dekker Inc, New York, 2004

REFERENCES:

1. Alphonse Dell'Isola, "Value Engineering: Practical Applications for Design, Construction, Maintenance & Operations", R S Means Co., 1997
2. Richard Park, "Value Engineering: A Plan for Invention", St. Lucie Press, 1999.
3. Anil Kumar Mukhopadhyaya, "Value Engineering Mastermind: From concept to Value Engineering Certification", SAGE Publications, 2003

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NEGOTIATION SKILLS (OEC-III)

Course Objectives:

1. To familiarize the students with various negotiation approaches and styles.
2. Understand & develop effective strategies for each stage of a negotiation
3. Identify Cross – cultural challenges that arise in negotiations
4. Enhance communication skills, emphasizing effective listening, persuasion & relationship building
5. Strengthen creative ability to expand the option for resolving a dispute.

Course outcomes:

At the end of the course students will be able to

1. Describe negotiation theories, concepts and tactics to manage negotiations
2. Explain the importance of various factors impacting negotiations.
3. Apply effective negotiation strategies and tactics for different scenarios
4. Identify negotiation practices towards building relationships
5. Evaluate various conflict resolution strategies.

Unit- I

Introduction to Negotiation: Introduction, Concept of Negotiation, Characteristics of a Negotiating Situation, Basic Negotiation Skills, Interpersonal Skills in Negotiation, Theories of Negotiation.

Unit- II

Types of Negotiation: Types of Negotiation, Principles of Negotiation, Steps of Negotiation, Win-Win Negotiation, Negotiation Tactics, Factors Affecting Success in Negotiation.

Unit- III

Strategies of Negotiation: Fundamentals of Negotiation, Effective Strategies to develop Negotiation Skills, Anchoring / BATNA, Process of Negotiation and Negotiation Phases.

Unit –IV

Improving Negotiation skills: Enhancing Communication skills for effective Listening, Persuasion & Relationship Building, establishing Trust-Building Relationships.

Unit- V

Managing Negotiation: Managing Different Types of Negotiations, Cross –Cultural Challenges in Negotiations, Industrial Negotiation: Collective Bargaining, Arbitration, Origins of Conflict, Dispute Resolution.

TEXT BOOKS:

1. Fredluthans, Organisational Behavior, 9thed, Prentice Hall.
2. Roger Fischer, Essentials of Negotiations, Harward Business School Press.

REFERENCES:

1. Beverly DeMarr and Suzanne De Janasz, Negotiation and Dispute Resolution, Prentice Hall, 2013.
2. Roy J Lewicki, Bruce Barry, and David M Saunders, Essentials of Negotiation, 5th Edition, McGraw Hill, 2011
3. Malhotra, Deepak, Negotiating the Impossible: How to Break Deadlocks and Resolve ugly Conflicts (without money or muscle). Oakland, CA: Berrett-Koehler Publishers, 2016.
4. Fatima, Shaheed; Kraus, Sarit; Wooldridge, Michael, Principles of Automated Negotiation. Cambridge, UK; New York: Cambridge University Press, 2015.
5. Subramanian, Guhan, Dealmaking: New Dealmaking Strategies for a Competitive Marketplace. New York: W. W. Norton & Company, 2011.

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PROJECT MANAGEMENT (OEC-III)

Course Objectives:

1. To understand the concept of Project Management.
2. To know about the different approaches to project screening and planning.
3. To explain about the factors of risk involved in project execution.
4. To understand about team leading and functional cooperation.
5. To know about the project performance and future trends in the project management.

Course Outcomes:

At the end of the course students will be able to

1. Explain about the life cycle and other concepts of Project Management.
2. Apply different approaches to project screening and planning
3. Analyze different risk factors in project execution
4. Estimate how to lead a team, to get functional cooperation
5. Build performance evaluation reports and future trends in project management.

Unit-I

Introduction: Meaning, Need, Principles Project Lifecycle and its Phases, Project Management Research in brief, Project Management today, Organization strategy and structure and culture, Format of organization structure, Stake holder Management, Organization Culture, creating a culture for Project Management.

Unit-II

Project Identification and Planning: Defining the project, Project Identification Process, Approaches to Project Screening and Selection, Project Planning, Work Breakdown Structure, Financial Module, Getting Approval and Compiling a Project Charter, setting up a Monitoring and Controlling Process.

Unit-III

Project Execution: Initiating the Project, Controlling and Reporting Project Objectives, Conducting project evaluation, Risk, Risk Management Factors, Project Management, Four Stage Process, Risk Management an Integrated Approach, Cost Management, Creating a Project Budget.

Unit-IV

Leading Project Teams: Building a Project Team, Characteristics of an effective Project Team, achieving Cross- Functional Co-operation, Virtual Project Teams, Conflicts Management, Negotiations.

Unit-V

Performance Measurement and Evaluation: Monitoring Project Performances, Project Control Cycles, Earned Value Management, Human factors in Project Evaluation and Control, Project Termination, Types of Project Terminations, Project Follow-up. Current and Future Trends in Project Management.

TEXT BOOKS:

1. Gray, Larson, Project Management, Tata McGraw Hill, 2015
2. Jeffery K. Pinto, Project Management, Pearson Education, 2015

REFERENCES

1. Enzo Frigenti, Project Management, Kogan, 2015
2. R. Panneerselvam & P. Senthil Kumar, Project Management, PHI, 2015
3. Thomas M. Cappel, Financially Focused Project Management, SPD, 2008.

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STRESS MANAGEMENT (OE-III)

Course Objectives:

The course is designed to help the student understand the concepts of project management, explain how to identify the projects and planning, analyze how to execute the projects, assess how to lead the team and evaluation of projects and to explain the performance measurement and evaluation of the projects.

Course Outcomes:

By the completion of the course, Students will be able to:

1. Understand the sources of reducing stress among employees.
2. Improve the physiological and physical illness of employees and self.
3. Develop a right attitude among employees and self.
4. Adopt stress management strategies for personal well-being and well-being of team members.
5. Understand the leadership styles in stress and time management techniques

Unit-I

Introduction to Stress Management

Nature of stress, approaches to stress, Good stress Vs. Bad stress, the individual and work. Occupational stress, role stress, source of managerial stress.

Unit-II

Stress & thought process learning Stress & thought process learning. Manifestations of stress - stages of stress, signs of stress at work, personality types and stress.

Unit-III

Various linkages and Assessment of Stress Stress & personality, stress & motivation, verbal & non-verbal indications of stress, assessment of stress, general sources of stress, stress and health, physiological and psychological illness.

Unit-IV

Stress Management Stress management, stress diary, becoming change skilled, adopting a healthy lifestyle, right attitude, thought awareness, imaginary (auto-genic therapy), learning to relax, correct breathing, and goal planning.

Unit-V

Stress and Leadership Styles Stress & management of change, stress & conflict, leadership styles in stressful & non-stressful situations, organization and stress management, recognizing the signs, approaches to the problem, providing assistance. Time management, general advice - ten commandments for effective stress management.

TEXT BOOKS:

- 1.R. P. Banerjee, Stress Management through Mind Engineering, Sage Spectrum, 2021
2. Alok Chkarawal, Prathibha Goyal, Stress Management, Studera Press, 2018

REFERENCES

1. Wolfgang Linden, Stress Management, Sage Publication, 2005
2. Jonathan C Smith, Stress Management: A Comprehensive Handbook of Techniques and Strategies , 2002
3. K. Hari Gopal, Organizational Stress, University Press.
4. Ann Edworthy, Managing Stress, Open University Press, Buckingham, Phildephia.
5. Dr. Rakesh Chopra Santosh Sharma, The stress Cyclone Suffer or Emerge out: The choice of yours, Institute of corporate Management, Excel Books.