



ASSAM SCIENCE AND TECHNOLOGY UNIVERSITY

Guwahati

Course Structure and Syllabus

(From Academic Session 2018-19 onwards)

M.Sc. COMPUTER SCIENCE

4th Semester



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M.Sc. Computer Science 4th Semester

Semester IV / M.Sc. Computer Science: Course Structure

Sl. No.	Sub-Code	Subject	Hours per Week			Credits
			L	T	P	C
Theory						
1	MCS182401	Cryptography	3	1	0	4
2	MCS18240E2*	Elective-II	3	1	0	4
3	MCS18240E3*	Elective-III	3	1	0	4
Practical						
1	MCS182424	Project work	-	-	-	4
Total			9	3	0	16
Total Contact Hours per week : 12						
Total Credit: 16						

Elective-II Subjects		
Sl. No.	Subject Code	Subject
1	MCS18240E21	Natural Language Processing
2	MCS18240E22	Distributed Database Management Systems
3	MCS18240E23	Data Warehousing & Data Mining
4	MCS18240E24	Artificial Intelligence/ Expert System
5	MCS18240E25	Cloud Computing
6	MCS18240E26	Computer Vision
7	MCS18240E27	Advanced Computer Architecture
8	MCS18240E2*	Any other subject offered from time to time with the approval of the university

Elective-III Subjects		
Sl. No.	Subject Code	Subject
1	MCS18240E31	Mobile Computing
2	MCS18240E32	Speech Processing
3	MCS18240E33	Pattern Recognition
4	MCS18240E34	Big Data Analytics
5	MCS18240E35	Supply Chain & Logistics Management
6	MCS18240E3*	Any other subject offered from time to time with the approval of the university

Detailed Syllabus:

Course Code	Course Title	Hours per week L-T-P	Credit C
MCS182401	Cryptography	3-1-0	4

Module 1:

Foundations of Cryptography and Security:

Ciphers and Secret Messages, Security Attacks and Services.

Mathematical Tools for Cryptography:

Substitutions and Permutations, Modular Arithmetic, Euclid's Algorithm, Finite Fields, Polynomial Arithmetic, Discrete Logarithms.

Module 2:

Conventional Symmetric Encryption Algorithms: Theory of Block Cipher Design, Feistel Cipher Network Structures, DES and Triple DES, Modes of Operation (ECB, CBC, OFB, CFB), Strength (or Not) of DES.

Module 3:

Modern Symmetric Encryption Algorithms: IDEA, CAST, Blowfish, Twofish, RC2, RC5, Rijndael (AES), Key Distribution.

Stream Ciphers and Pseudo Random Numbers: Pseudo random sequences, Linear Congruential Generators, Cryptographic Generators, Design of Stream Cipher, One Time Pad.

Module 4:

Public Key Cryptography: Prime Numbers and Testing for Primality, Factoring Large Numbers, RSA, Diffie-Hellman, ElGamal, Key Exchange Algorithms, Public-Key Cryptography Standards.

Hashes and Message Digests: Message Authentication, MD5, SHA, RIPEMD, HMAC.

Module 5:

Digital Signatures, Certificates, User Authentication:

Digital Signature Standard (DSS and DSA), Security Handshake Pitfalls, Elliptic Curve Cryptosystems.

Authentication of Systems:

Kerberos V4 and V5, X.509 Authentication Service. Digital Watermarking and Steganography.

Recommended Books:

Text Books:

1. William Stallings, Cryptography and Network Security: Principles and Practice, 4th Edition, Prentice Hall Publisher, 2005.
2. Bruce Schneier, Applied Cryptography: protocols, algorithms, and source code in C, 2nd Edition, Wiley, 1996.
3. Alfred J. Menezes, Handbook of Applied Cryptography, CRC Press, 1996.
4. Michael Welschenbach, Cryptography in C and C++, Apress, 2001.

5. Douglas R. Stinson, Cryptography: Theory and Practice, 3rd Edition, Chapman & Hall /CRC, 2005.

Reference Books:

1. William Stallings, Cryptography and Network Security, 4th.Ed, Prentice Hall PTR, Upper Saddle River, NJ, 2006
2. Wenbo Mao, Modern Cryptography: Theory and Practice, Prentice Hall, 2004
3. Richard A. Mollin, An Introduction to Cryptography, Chapman and Hall/CRC, 2001

Course Code	Course Title	Hours per week L-T-P	Credit C
MCS18240E21	Natural Language Processing	3-1-0	4

Module 1:

Introduction to NLP, Linguistic Background: An outline of English syntax, Grammars and sentence structure , Regular Expressions, Formal Languages, Finite State Automata, Non deterministic Finite State Automata(NFSA),Using an NFSA to accept strings, Relating deterministic and non-deterministic FSA, Elementary probability theory and entropy.

Module 2:

Morphology & Finite State Transducers: Survey of (mostly) English morphology, Inflectional morphology, derivational morphology, Introduction to shallow parsing and morphological analyzer:Rule based POS tagger, Stochastic POS tagger ,Chunking, Use of Morphological analyzer in POS tagging.

Module 3:

Introduction to HMM Tagger: HMM for POS tagging, Viterbi algorithm, Parsing: Top Down Parsing, Bottom up Parsing, Earley Parsing, and Finite-State Parsing Methods.

Module 4:

Application of Bayes Theorem in Statistical NLP – (Spell Checker as a case study), Collocations, Probabilistic Context Free Grammar (PCFG), finding the most likely parse for a sentence, Training a PCFG

Module 5:

Introduction to Word Sense Disambiguation: Supervised Disambiguation, Dictionary based disambiguation, Unsupervised disambiguation, clustering in statistical NLP

Recommended Books:

Text Books/ Reference Books:

1. James Allan, Natural Language Understanding, Pearson Education, 1995.
2. Jurafsky and Martin, Speech and Language Processing, Pearson Education, 2000.
3. Manning and Schutze, Foundations of Statistical Natural Language Processing, MIT Press, 1999.
4. Bharati *et al.*, Natural Language Processing, PHI, 1996

Course Code	Course Title	Hours per week L-T-P	Credit C
MCS18240E22	Distributed Database Management Systems	3-1-0	4

Module 1: Introduction:

Distributed Data Processing, Distributed Database Systems, Promises of DDBSs, Complicating factors, Problem areas

Module 2: Overview of RDBMS

Concepts, Integrity, Normalization

Module 3: Distributed DBMS Architecture:

Models- Autonomy, Distribution, Heterogeneity
DDBMS Architecture – Client/Server, Peer to peer, MDBS

Module 4: Distributed Database Design:

Alternative Design Strategies, Distribution Design Issues, Fragmentation, Distribution Transparency, Impact of distribution on user queries, and Allocation

Module 5: Semantic Data Control:

Authentication and Access rights, View Management, Data Security, Semantic Integrity control & its enforcement

Module 6: Overview of Query Processing:

Query Processing Problem, Objective of Query Processing, Complexity of Relational Algebra Operations, Query processing in centralized system, Query processing in distributed system, Characterization of Query Processors, Layers of Query Processing.

Module 7: Query Decomposition & Data Localization:

Query Decomposition, Localization of Distributed Data.

Module 8: Optimization of Distributed queries:

Query optimization, Centralized Query optimization, Join Ordering in Fragmented Queries, Distributed Query Optimization algorithms.

Module 9: Introduction to Transaction Management:

Definition of Transaction, Properties of Transactions, Types of Transactions.

Module 10: Distributed Concurrency Control:

Serializability Theory, Taxonomy of Concurrency Control Mechanisms, Lock based Concurrency Control Mechanisms, Time Stamp-Based Concurrency Control Algorithms, Optimistic Concurrency Control Algorithms, Deadlock Management, Relaxed Concurrency Control.

Module 11: Distributed DBMS Reliability

Reliability Concepts & Measures, Failures & Fault Tolerance in Distributed systems, Failures in Distributed DBMS, Local Reliability Protocols, Distributed Reliability Protocols, Dealing with site failures, Network Partitioning.

Module 12: Parallel Database Systems

Database Servers, Parallel Architectures, Parallel DBMS Techniques, Parallel Execution problems, Parallel Execution for Hierarchical Architecture.

Module 13: Database Interoperability

Database Integration, Query Processing, Transaction Management, Object Orientation & Interoperability.

Reference Books:

1. Principles of Distributed Database Systems by M. Tamer Ozsu, Patrick Valduriez (Pearson Publication)
2. Distributed Database Management Systems- A Practical Approach by Saeed K Rahimi, Frank S Haug (Wiley Publication)
3. Distributed Databases Principles and Systems by Stefano Ceri, Giuseppe Pelagatti (Mcgraw Hill Publication)

Course Code	Course Title	Hours per week L-T-P	Credit C
MCS18240E23	Data Warehousing & Data Mining	3-1-0	4

Module 1: Introduction to Data Warehousing

Concept of data warehouse and its evolution, Capabilities and Limitations, Benefits of Data Warehouse, Features of Data Warehouse, Lifecycle of Data, Information Flow Mechanism, Metadata, Data flow from Warehouse to Operational Systems).

Module 2: Data Warehouse Architecture

Data Warehouse Architecture, Data Warehouse and Data Marts, ETL Process, Process architecture, Warehouse Manager Architecture, Query Manager Architecture, Building Data Warehouse and Data marts, Issues in Data Marts, Planning and Design of Data Warehouse.

Module 3: Data Warehouse Schema

Introduction, Fact data, Dimension data, Partitioning data, Dimensional Modelling, Star Schema, Snowflake Schema, Fact constellation Schema, Strengths of Dimensional Modelling, Aggregation, Data Warehouse and Data Model.

Module 4: Design

Requirements Gathering Methods, Requirement Analysis, Dimensional Analysis, Planning and Project Management, Multidimensional Data model, Data cube, Hypercube, OLAP operations, OLAP Models.

Module 5: Hardware and operational Design

Hardware architecture, physical layout security backup recovery, Capacity planning, Tuning and Testing data warehouse.

Module 6: Introduction to Data Mining

Concept of data mining, Definitions of Data Mining, Learning, KDD and DM, Knowledge Discovery Process and its different stages DBMS and DM, DM techniques, Other Mining Problems, Issues and Challenges in DM, DM Application Areas.

Module 7: Classification and Predictions

Introduction to Classification, Issues regarding in Classification and Prediction, Different Classification Methods including Decision Tree Induction, Bayesian Classification, Neural Network Technology, K – nearest Neighbours Classifier, Case Base Reasoning, Fuzzy Set Theory, Genetic Algorithm; Linear and Multiple Regression, Nonlinear Regression, Other Reasoning Models, Classifier Accuracy, Prediction, Accuracy and Error measures evaluating accuracy of a classifier, model selection.

Module 8: Association Rules

Introduction to Association Rules, Methods to Discover Association Rules, Types of Association Rule Mining Algorithm (A Priori Algorithm, Partition Algorithm, Pincer – Search Algorithm, FP – Tree Growth Algorithm, Border Algorithm).

Module 9: Clustering Techniques

Introduction to Clustering, Clustering Paradigms, Similarity and Distance Measures, Types of data in cluster analysis, Outliers, Partitioning Algorithms (K-Means, K-Medoid), Hierarchical Clustering (Agglomerative Algorithm, Divisive Algorithm), Density Based Algorithm (DBSCAN, BIRCH, CURE).

Module 10: Emerging Trends in Data Mining

Web Mining, Text Mining, Sequence Mining, Mining Time-Series Data, Spatial Data Mining, Neural Network, Support Vector Machine, Rough Set Theory.

Recommended Books:

1. Reema Thareja, “Data Warehousing”, Oxford.
2. Jiawei Han and Micheline Kamber, “Data Mining Concepts and Techniques”, Second Edition, Elsevier
3. Arun K Pujari, “Data Mining Techniques”, Second Edition, Orient Longman Publishers
4. Margaret H. Dunham, “Data Mining Introductory and Advanced Topics”, Prentice Hall India

Course Code	Course Title	Hours per week L-T-P	Credit C
MCS18240E24	Artificial Intelligence/ Expert System	3-1-0	4

Module 1: Introduction to the object and goal of artificial intelligence:

Aim and scope of the artificial intelligence, problem space and problem characteristics, state space representation.

Module 2: Problem solving techniques:

Generate and test, hill climbing , search problem reduction techniques, constraint propagation, means-end-analysis, heuristics search techniques and heuristic problem solving .

Module 3: Game playing:

And or graph search, game trees and associated techniques, minimax and alpha beta pruning. Some case studies.

Module 4: Knowledge representation and inferencing:

Procedural and deductive approaches production system formalism, predicate logic (first order and second order), Rule based system, schematics net, conceptual dependencies, conceptual path, frames, scripts associated inferencing mechanism. Resolution in predicate logic, unification, natural deduction theorem proving, forward and backward deduction.

Different techniques for reasoning under uncertainty, monotics and non monotonic reasoning. Constraint satisfaction problem

Introduction to Natural Language Processing, Grammar, Derivation techniques, parse tree.

Module 5: Rule based system and expert system:

Domain exploration, meta language, expertise, transfer self-explaining system case studies (dendral, mycin), working memory, Knowledge base, inference engine

Module 6: Introduction to neural network:

Definition and representation of artificial neuron and its analogy with biological neuron, basic concepts of three layer neural-net and learning by back propagation.

Recommended Books:

1. Artificial Intelligence By Patrick, Henry, Winston, Pearson Education.
2. Introduction to Artificial Intelligence By Charniak, Mc Dermott, Pearson Education.
3. Artificial Intelligence By Rich and Night
4. Introduction to Artificial Intelligence and Expert system By Dan W. Patterson

Course Code	Course Title	Hours per week L-T-P	Credit C
MCS18240E25	Cloud Computing	3-1-0	4

Module 1: Cloud Computing Fundamentals

Cloud Computing definition, private, public and hybrid cloud. Cloud types; IaaS, PaaS, SaaS. Benefits and challenges of cloud computing, public vs private clouds, Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization - Virtualization Structures, role of virtualization in enabling the cloud; Business Agility: Benefits and challenges to Cloud architecture. Application availability, performance, security and disaster recovery; next generation Cloud Applications.

Module 2: Cloud Applications

Technologies and the processes required when deploying web services; Deploying a web service from inside and outside a cloud architecture, advantages and disadvantages

Module 3: Management of Cloud Services

Reliability, availability and security of services deployed from the cloud. Performance and scalability of services, tools and technologies used to manage cloud services deployment; Cloud Economics: Cloud Computing infrastructures available for implementing cloud based services. Economics of choosing a Cloud platform for an organization, based on application requirements, economic constraints and business needs (e.g Amazon, Microsoft and Google, Salesforce.com, Ubuntu and Redhat)

Module 4: Application Development

Service creation environments to develop cloud based applications. Development environments for service development; Amazon, Azure, Google App.

Module 5: Cloud It Model

Analysis of Case Studies when deciding to adopt cloud computing architecture. How to decide if the cloud is right for your requirements. Cloud based service, applications and development platform deployment so as to improve the total cost of ownership (TCO)

Module 6: Security In The Cloud

Security Overview – Cloud Security Challenges and Risks – Software-as-a-Service Security – Security Governance – Risk Management – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security - Identity Management and Access Control – Autonomic Security.

Recommended Books:

1. Gautam Shroff, “Enterprise Cloud Computing Technology Architecture Applications”, Cambridge University Press; 1 edition, [ISBN: 978- 0521137355], 2010.
2. Toby Velte, Anthony Velte, Robert Elsenpeter, “Cloud Computing, A Practical Approach” McGraw-Hill Osborne Media; 1 edition [ISBN: 0071626948], 2009.
3. Dimitris N. Chorafas, “Cloud Computing Strategies” CRC Press; 1 edition [ISBN: 1439834539], 2010.
4. John W.Rittinghouse and James F.Ransome, “Cloud Computing: Implementation, Management, and Security”, CRC Press, 2010.

Course Code	Course Title	Hours per week L-T-P	Credit C
MCS18240E26	Computer Vision	3-1-0	4

Module 1:

Fundamentals, Image Formation, Sampling and Quantization, Mathematical Preliminaries, Image Transformation, Image Enhancement and restoration.

Module 2:

Image segmentation, Feature Extraction and Selection, Object representation, Morphological Image processing.

Module 3:

Object Recognition, Pattern Recognition: Statistical, Structural, Neural and Hybrid Techniques, Recent Developments.

Recommended Books:

Text Books:

1. Fundamental of Image Processing by R.C.Gonzalez
2. Digital Image Processing by A.K.Jain

Reference Books:

1. Image Processing and Analysis by Milan Sonka
2. Selected Research papers from International Journal

Course Code	Course Title	Hours per week L-T-P	Credit C
MCS18240E27	Advanced Computer Architecture	3-1-0	4

Module 1: Prerequisite:

Computer Organization, Operating System.

Module 2: Introduction to Parallel Processing:

Parallel Processing Mechanism Parallelism in uniprocessor systems.

Module 3: Parallel Computer Structures:

Architecture classification scheme.

Module 4: Pipeline and Vector Processing:

Instruction and arithmetic pipelines; Vector Processing requirements; Pipeline computers and vectorization methods;

Module 5: Various vector processors:

STAR 1 00, CRAY - 1, CYBER - 205, Fujitsu 200 and their special features.

Module 6: SIMD Array Processors:

Parallel algorithms for array processors; SIMD computers and performance enhancement.

Module 7: Multiprocessor Architectures and Programming:

Functional Structures, Interconnection networks, parallel memory organizations; Multiprocessor Control and Algorithms, Interprocess Communication Mechanism. System Deadlocks and Protection, Multiprocessor Scheduling Strategies, Parallel algorithms for multiprocessor - synchronous and asynchronous.

Module 8: Data Flow Computers:

Data - driven computing and languages; Advantage and potential difficulties, etc.

Recommended Books:

Text Books:

1. Hawang , K., Briggs, F.A. : Computer Architecture and Parallel Processing, McGraw Hill , 1985
2. Evans , D.J. : Parallel Processing System, Cambridge Univ. , 1982.
3. Stone , H.S. & Others : Introduction to computer Architecture, 2nd Edition. , Galgotia Publ. Ltd . 1987.

Course Code	Course Title	Hours per week L-T-P	Credit C
MCS18240E31	Mobile Computing	3-1-0	4

Module 1: Introduction:

Cellular networks, wireless LANs, application adaptation.

Module 2: Cellular Overview:

Cellular concepts, location management, handoffs.

Module 3: Wireless LAN overview:

MAC issues, mobile IP, ad hoc networks, TCP issues.

Module 4: Applications overview:

wireless applications, disconnected operations, data broadcasting, mobile agents.

Module 5: GSM:

Air-interface, channel structure, timing, architecture.

Module 6: WAP:

Architecture, protocol stack, application environment.

Module 7: TCP:

Asymmetric links, wireless errors, handoffs; i-tcp, snoop, link rxmit, m-tcp.

Module 8: Ad hoc networks:

MAC, routing, transport. Routing: Virtual backbone, Kelpi, mobile-IP.

Module 9: Data broadcasting:

Push-pull, consistency.

Module 10: Location management:

HLR-VLR, hierarchical.

Module 11: Access Technologies:

Blue Tooth, GPRS, IEEE 802.11, CDMA. QoS in Wireless.

Text / Reference Books:

1. Schiller, Mobile Communications, Addison Wesley, 2003
2. Mehrotra, GSM System Engineering.
3. M V D Heijden, Understanding WAP, Artech House, 2000.
4. Charles Perkins, Mobile IP, Addison Wesley, 1999.
5. Charles Perkins, Ad hoc Networks, Addison Wesley, 2000

Course Code	Course Title	Hours per week L-T-P	Credit C
MCS18240E32	Speech Processing	3-1-0	4

Module 1: Signals and Systems:

Energy & power signals, FT, FFT, STFT, Sampling Theorem, Discrete-Time Signals and Systems, Discrete-Time Fourier Transform, FIR, IIR filters, LPF, HPF and BPF filters, Hamming Window, Weigner window.

Module 2: Analogy and Physiology of Speech Production mechanism:

Lungs, Larynx, vocal Tract, Categorization of Speech Sounds, Elements of a language: vowels, Nasals, Fricatives, plosives. Speech perception; Voiced and Unvoiced sounds, Spectral Analysis of Speech: Formant Frequency, Cepstral Frequency, Mel-cepstra, Fundamental frequency, Power spectral analysis, PSD, Energy Spectra.

Module 3: Analysis and Synthesis of Pole-Zero Speech Models-

Deterministic signals, Linear Prediction of Speech Signal; Homomorphic signal Processing- Homomorphic Filtering.

Module 4: Speech Coding:

Statistical Model, Vector Quantisation, Frequency Domain coding, Linear predictive Coding (LPC); HMM, Dyanamic Time Wrapping; Speech enhancement, Speaker Recognition Algorithms, Application of Neural Network in Speaker recognition, Concept of Classes and clustering in the speech recognition.

Recommended Books:

1. Speech Signal Processing-T.E. Quatieri, Pearson LPE.
2. Speech and Language Processing-Daniel Jurafsay, Tames H. Mrtian.
3. Digital Processing of Speech Signal-Lawrence R. Rabiner, Ronald w. Schafer
4. Fundamentals of Speech Recognition- Lawrence R. Rabiner, Biing-Hwang Tuong

Course Code	Course Title	Hours per week L-T-P	Credit C
MCS18240E33	Pattern Recognition	3-1-0	4

Module 1:

Introduction: Preliminary concepts and pre-processing phases, coding, normalization, filtering, linear prediction, Feature extraction and representation thresholding, contours, regions, textures, template matching.

Module 2:

Data structure for pattern recognition, statistical pattern recognition, clustering Technique and Application. Study of Pattern classifiers: Supervised and Unsupervised.

Parametric Discriminant Functions: Linear and quadratic discriminants; Shrinkage; Logistic classification; Generalized linear classifiers; Perceptrons; Maximum Margin; Error Correcting Codes;

Module 3:

Pattern classifiers: Naive Bayes, Linear Discriminant Analysis, k-nearest neighbour, Artificial Neural Network etc. And case studies.

Recommended Books:

1. R.O. Duda, P.E.Hart and D.G. Stork, Pattern Classification, John Wiley, 2001
2. K. Fukunaga, Statistical pattern Recognition; Academic Press,2000
3. Devi V.S., Murty, M.N., Pattern Recognition: An Introduction, University Press, Hyderabad,2011

Course Code	Course Title	Hours per week L-T-P	Credit C
MCS18240E34	Big Data Analytics	3-1-0	4

Module 1: Basics of Data Structures

Introduction – distributed file system – Big Data and its importance, Six Vs, Drivers for Big data, Big data analytics, Big data applications. Algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce.

Module 2: Technologies and tools for big data analytics

Introduction to MapReduce/Hadoop, Data analytics using MapReduce/Hadoop, Data visualization techniques, Spark

Module 3: Theory and methods for big data analytics

Selected machine learning and data mining methods (such as support vector machine and logistic regression), Statistical analysis techniques (such as conjoint analysis and correlation analysis), Time series analysis D. Big data graph analytics

Module 4: Hive And Hiveql, Hbase

Hive Architecture, Comparison with Traditional Database, HiveQL - Querying Data - Sorting and Aggregating, Map Reduce Scripts, Joins & Subqueries, HBase Concepts-Advanced Usage, Advance Indexing - PIG, Zookeeper - how it helps in monitoring a cluster.

Recommended Books:

Text Books:

1. Chris Eaton, Dirk deRoos et al. , “Understanding Big data ”, McGraw Hill, 2012
2. Vignesh Prajapati, “Big Data Analytics with R and Hadoop”, Packet Publishing 2013.
3. Bart Baesens, “Analytics in a Big Data World- The essential guide to Data Science and its Applications”, Wiley
4. Pranhari Talukdar, “Big Data and Cloud Computing”

Reference Books:

1. Tom White, Hadoop: The Definitive Guide, O’Reilly Media, Third Edition, 2012.
2. Bill Franks, Taming The Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics, Wiley, 2012.

Course Code	Course Title	Hours per week L-T-P	Credit C
MCS18240E35	Supply Chain & Logistics Management	3-1-0	4

Module 1:

Financial statement analysis of Balance Sheets, Profit and Loss accounts, Cash flow and Funds Flow statements, Elements of Valuation, Capital Budgeting, Risk and Return, Long term and Short term Financial Planning, Overview of Financial services industry

Pedagogy

Problems: Case studies, Presentations, Industry based assignments and Computer based assignments

Module 2:

Marketing concept, Marketing mix, Product, Price, Promotion and Distribution, Marketing Planning, Marketing control and organizing for marketing

Pedagogy

Case studies, Presentation and Industry based assignments

Module 3:

Employee sourcing, recruitment and selection, performance management, reward management, training and development and employee relations

Pedagogy

Case studies, Experimental exercises and Industry based assignments

Module 4:

Perception, personality, attitudes, motivation, learning, interpersonal behaviour, group dynamics, conflicts, stress, power and politics, leadership and communication. New trends in organizational behaviour from academic literature and practice including critical perspectives.

Pedagogy

Case studies, Experimental exercises and Industry based assignments

Module 5:

Financial statement analysis, valuation, capital budgeting, Risk and Return, Long Term and short term Financial Planning, Financial Engineering

Pedagogy

Problems, Case studies, Presentations and Industry based assignments

Module 6:

Balance sheets and profit and loss account, Accounting mechanics, Accounting records and Systems, Understanding published accounts of companies. Use of software in accounting

Pedagogy

Problems, Case studies, analysis of published accounts of companies, Computer based exercises

Module 7:

Basic cost concepts, cost classification, allocation and absorption of costs, cost centers etc.; Cost analysis for managerial decisions- Direct costs, Break Even analysis, Relevant costs etc.; Pricing – joint costs, Make or buy, relevant fixed costs, sunk costs etc.; Cost analysis and control standard costing, variance analysis, Module and output costing, budgeting and control.

Pedagogy

Problems, Case studies, analysis of published accounts of companies , Computer based exercises and understanding of recording systems of real life organizations.

Module 8:

Role of IS and IT, operational and Strategic, Hardware and Software for IS, types of IS such as TPS, MIS, EIS, DSS , KS etc., DBMS and RDBMS, communication and Networking, Internet , ERP implementation issues.

Pedagogy

Computer based exercises and Industry based assignments to understand IS practices

Reference Books:

1. Ross, Stephen. A., Westerfield, Randolph W. and Bradford D. Jordan, “Fundamentals of Corporate Finance”; Tata McGraw-Hill; Latest edition.
2. Kotler, Philip, “A Framework for Marketing Management”; Pearson Education India, Latest Edition.

Course Code	Course Title	Hours per week L-T-P	Credit C
MCS182424	Project Work	0-0-0	4

Project Work: The student has to pursue a major project work in the areas of RDBMS, Web Technology, Image Processing, Data Mining, Speech Processing, NLP etc. under the supervision of a faculty of the department.

During the project work, the student is required to present a seminar in the Synopsis of the project after the selection of the topic in presence of the expert committee (internal). At the end of the semester course work, final seminar cum viva on the project work will be held in presence of the departmental committee and one external examiner as appointed by University.
