SEMESTER I

21GM01 FUNDAMENTALS FOR MANAGERS

UNIT 1: Management Concepts 15 Hours

UNIT 2: Basic Accounting 15 Hours
Generally Accepted Accounting Principles - Accounting Standards; Financial Accounting – Users of Accounting Information – Accounting cycle – Accounting Process; Accounting Equation - Classification of Accounts – Trial Balance - Preparation of Profit and Loss Account and Balance Sheet

UNIT 3: Basic Mathematics 15 Hours
Probability – Discrete probability distribution - Expected monetary value; Continuous probability distribution – Cumulative probability distribution –Normal distribution - Conditional probability; Linear programming problem formulation – Solving LPP by Graphical method - Project network diagram - Critical path method - Program evaluation and review technique

Total : 45 Hours

Reference Books

21GM11 BUSINESS ENVIRONMENT 3003

UNIT 1: The Dynamics and Challenges of Business Environment 9 Hours
Defining a business and its role- Defining stakeholder-Contradictions in business objectives and stakeholder objectives-The role of business in society and economy-The internal and external environments for a business:-An Introduction-the VUCA environment and the business challenges.-Dynamics of the SPECTACLES :Social, Political, Economic, Cultural, Technological, Aesthetic, Customer, Legal, Environmental and Sectoral environment , Analysis and the interconnectedness- The issue of ethics and sustainability in the business environment.

UNIT 2: Analysing Economic Performance 10 Hours
The Indian budget and its impact on the nation-The fiscal and monetary policies and the challenges. The role of RBI and banks.

UNIT 3: Evaluating Competition and Industry Characteristics 8 Hours
Industry SWOT and drivers of industry and the impact of PESTLE on specific sectors- Porter’s Five Forces: An overview- Thompson and Strickland 7S model- The value chain and economies of scale, integration and location.

UNIT 4: Analysing Industry Dynamics and Trends 8 Hours

UNIT 5: Understanding Contemporary Issues and Trends Impacting Business Environment 10 Hours

Total 45 Hours

Reference Books
21GM12 ECONOMICS FOR DECISION MAKING

UNIT 1: Demand and Supply - Consumer Behaviour

UNIT 2: Production Economics

UNIT 3: Market Economics

UNIT 4: Macro Economics
Demand for Money - Supply of Money and its Components – Rate of Interest – Saving and Investment – Multiplier and Accelerator – Monetary Policy and Fiscal Policy

UNIT 5: International Economics
International Trade – Theories – Balance of Payment – Current and Capital Account – Terms of Trade - Exchange Rate

Total 45 Hours

Reference Books

21GM13 MANAGERIAL COMMUNICATION

UNIT 1: Communication Framework
Communication process - Types of Communication - Importance of feedback and Context - Communication networks in organizations, Classification, Role and importance of non-verbal communications, The classification and the art of proactive listening, Barriers to communication and the symptoms of poor communications.

UNIT 2: Preparing Written Business Information
Distinguishing features of professional communication vis-à-vis personal communication- The Writing process for business messages – Key criteria for effective messages- Preparing written communication in the professional context: Proposals, Resumes, and Reports.

UNIT 3: Business Presentations
Planning for presentation-presentation tools, strategies for preparation, presentation and audience engagement- Presentation techniques-Dos and don’ts, effective mapping and checklists for delivering presentations- Developing Public Speaking skills.

UNIT 4: Workplace Communication and Etiquettes
The protocols for good workplace communications, communication hierarchy in an organization- intra and inter departmental communication - Managing communication for events - effective participation in discussions and negotiations- interviewee and interviewer skills- Etiquettes for Managers

UNIT 5: Strategies for Business Writing
Managing the organizational communication processes- communicating good, bad news – writing persuasive messages, Communications in the context of social media, legal aspects of formal and non-formal communications in the managerial context

Total 75 Hours

Reference Books

21GM14 ACCOUNTING FOR MANAGERS

Total 75 Hours

Reference Books
UNIT 1: Corporate Financial Statements
Understanding and preparing corporate profit and loss statement with adjustments, Balance Sheet and Cash Flow Statement – Overview of IFRS – Ethics in Accounting

UNIT 2: Analysis of Financial Statements

UNIT 3: Cost Behaviour
Cost Accounting – Introduction - Elements of Cost – Cost Behaviour – Cost Sheet —-Cost Allocation - Accounting for Overheads Marginal and Absorption costing

UNIT 4: Cost and Decision making

UNIT 5: Accounting for Planning And Control
Budgets – Types – Budgetary Control – Standard costing and Variance Analysis - Cost and Sales Variances – Use of Accounting information for Management Control

Total : 60 Hours

Reference Books

21GM15 ORGANIZATIONAL BEHAVIOUR

UNIT 1: Fundamentals of Organizational Behaviour and Individual Behaviour
Introduction to Organizational Behaviour - Meaning and Importance of OB - Hawthorne Studies - Basic OB Model - Different approaches to OB - Scope and Significance of OB; Personality and its Determinants - Big Five Personality Traits - Myers-Briggs Type Indicator and other Primary Traits; Attitudes - Components of Attitudes - Behaviour and Attitudes - Major Job Attitudes; Values – importance – Types

UNIT 2: Motivation
Characteristics of Motivation -Process of Motivation - Theories of Motivation - Problems in Motivation; Application of Motivation at workplace- Employee Involvement and Rewards

UNIT 3: Leadership
Leadership Styles and Effectiveness - Theories of Leadership - Trait Theories - Behavioural Theories - Contingency Theories - - Modern approaches to Leadership - Servant Leadership

UNIT 4: Group Dynamics, Power and Politics
Difference between Group and Team - Types of Groups and teams – Stages of Group formation – Characteristics of Groups and Decision Making - Model for Team Effectiveness - Troubles with Team and Social Loafing; Workplace Diversity and Inclusion. Power – Bases of Power – Power Tactics. Organizational Politics – Factors contributing to political behaviour’, People Response to Organizational Politics

UNIT 5: Organizational Culture and Design
Characteristics of an Organizational Culture - Elements of Organizational Culture - Importance of Sub-Culture - Dimensions of Culture and Artifacts – Creating and sustaining culture; Organization Design – Structure and the need for different structures – Conventional Structures and New age Structures; Work Stress: Understanding workplace stress and its consequences - Stress coping strategies

Total : 60 Hours

Reference Books
21GM16 RESEARCH METHODS

UNIT 1:  Research Process

UNIT 2:  Research Design and Data Collection
Classification of Research Design – Exploratory Studies, Descriptive studies and Causal Studies - Qualitative and Quantitative Data Collection Methods – Primary and Secondary Data Collection - Experimental Research Design; Data collection – Target Population - Sampling Frame - Sampling methods - Size of Sample - Probability Sampling – Non-Probability Sampling

UNIT 3:  Measurement Scales and Basic Statistical Tools

UNIT 4:  Comparison Tools
Estimation - Parametric Inference – Hypothesis – Null and Alternative Hypothesis - ANOVA test – t test, Paired t test; Non-parametric Inference - Goodness of fit – One sample tests – Software based analysis and Interpretation

UNIT 5:  Relationship Tools
Contingency Tables – Chi-square test – Correlation - Scatter diagram - Karl Pearson Coefficient - SimpleLinear regression

Total : 45 Hours

Reference Books

21GM17 SPREADSHEET APPLICATIONS

UNIT 1:  Spreadsheet Environment
Basic text and cell formatting – Selecting ranges - Freeze pane – Using comments – Text functions for purification of large dataset – Date format and conversion - Auto completion of series - Table formatting and highlighting - Conditional formatting –Visualizing data using graphs - Working with multiple worksheets

UNIT 2:  Formulas and Functions
Auto filter and custom filter – Auto sort and custom sort - Relative and absolute cell references – Writing formulas – Logical Operators - Lookup function – Index command - Statistical functions - Financial functions

UNIT 3:  Advanced Functions

Total : 30 Hours

Reference Books

21GM18 ACTIVE LEARNING PROGRAMME - 1

UNIT 1:  Exploring Oneself
Knowing oneself – Identifying strengths and weakness; Understanding the members of the team.

UNIT 2:  Identifying as a leader

Total : 10 Hours
Being an instructor – Difficulties faced in making people understand; ways to increase active listening.

UNIT 3: Team Coordination and Trust
Experiencing team coordination – Challenges to bring in coherence; Building trust on oneself and on the members of the team

UNIT 4: Career Empowerment
Career Empowerment Module
Total: 60 Hours

21GM19 MANAGERS IN SOCIETY

UNIT 1: Managerial Ethics
Understanding the seven ethical principles, Approaches to ethical decision making, eight ethical tests, understanding non-compliance rationale and the consequences of non-compliance.

UNIT 2: Sustainable Development

UNIT 3: Social Marketing
Relevance of social marketing in the Indian context, rationale and examples of social marketing, understanding drivers to change behaviours from a social and individual perspective

UNIT 4: The Sharing-Caring-Giving Concept
Human Development Index, Corporate Social Responsibility, Creating Shared Value, current legislations, case studies of Indian examples.

UNIT 5: Activity Components
- Plan and execute social marketing campaigns relevant to the region.
- Create and deliver projects/surveys to add value to the concerned stakeholders.
Total: 60 Hours

Reference Books

SEMESTER II

21GM20 FINANCIAL MANAGEMENT

UNIT 1: Fundamentals of Financial Management
Goals of finance – Functions of a finance manager- Time value of money – Concepts – Basic models of valuation – Valuation of debt, preference and equity

UNIT 2: Cost of Capital
Computing specific costs of capital – Cost of debt, Preference shares, Equity and Retained earnings – Computation of WACC

UNIT 3: Investment Decisions
Capital budgeting process – Evaluation of capital expenditure decisions – DCF and Non-DCF Techniques

UNIT 4: Capital Structure

UNIT 5: Working Capital
Short-term sources of financing – Working capital policies – Determinants of working capital – Management of current assets and current liabilities
Total: 45 Hours

Reference Books
21GM21 HUMAN RESOURCE MANAGEMENT

UNIT 1: Overview of Human Resource Management 8 Hours
Significance of Human Resources - Nature, Scope, Objectives, and Functions of HRM - Evolving Strategic Role of HRM - Challenges and Contingencies in HRM - Managing Global Human Resources - Understanding difference between domestic and global workforce

UNIT 2: Human Resource Planning, Recruitment and Selection 10 Hours
HR Planning - Objectives and Process; Job Analysis - Uses, Steps and Techniques; Job Description - Contents and Problems with Job Description; Job Specification and Competency Profiling; Recruitment Sources - Selection Process - Induction and Orientation - Placement and Socialization - International Hiring Practices

UNIT 3: Performance Appraisal and Compensation 10 Hours

UNIT 4: Training and Development 8 Hours
Training need analysis - Areas of training - Training, Development and Education - Training Steps and Methods - Learning Principles - Management Development - Process and Methods - Career development

UNIT 5: Employee Relations, Employee Safety and Health 9 Hours

Total: 45 Hours

Reference Books

21GM22 MARKETING MANAGEMENT

UNIT 1: Basics of Marketing 9 Hours
Introduction to Marketing - Understanding the Marketing Process - Understanding Marketing Plan - Marketing Myopia Refresher and Recent Trends in Marketing (Digital and Social Media) - Scanning the Environment- Micro and Macro Analysis (Sectoral Analysis)

UNIT 2: Marketing Strategy 10 Hours
Marketing Objectives and Strategy formulation - Marketing Analysis for Strategy (5 C's) - Creation of marketing plan - Marketing research & Intelligence - Consumer Behaviour and the buying process - Consumer Decision Making Journey

UNIT 3: Creating Customer Value 8 Hours
Marketing Mix elements - Segmenting the markets - Target market selection - Market positioning

UNIT 4: Capturing and Communicating Customer Value 12 Hours
Marketing mix - Product, Service and Branding Decisions - Pricing Strategies - Designing and Managing channels of distribution - Marketing Communications

UNIT 5: Sustainable & Ethical Marketing 6 Hours
Sustainable marketing Practices - Ethics in marketing - Socially Responsible Marketing Practices - Global Marketing Perspectives

Total: 45 Hours

Reference Books
21GM23 OPERATIONS MANAGEMENT 3 0 0 3

UNIT 1: Evolution of Operations Management 9 Hours
History and evolution of operations management - Systems concept - Operations strategy - Value addition vs value destruction - Managerial roles and responsibilities of managers in operations

UNIT 2: Sourcing and Supply Management 9 Hours
Facility location - Location selection - Sourcing methods and Vendor rating - Supply chain principles - Inventory management principles - Stores management and control

UNIT 3: Forecasting and Capacity Analysis 9 Hours
Forecasting: Importance, methods, accuracy measures; Process capacity: analysis, sources of capacity increase - Design principles of manufacturing systems - Service operations design – Demand planning

UNIT 4: Quality Management 9 Hours

UNIT 5: Production Planning and Control 9 Hours
Sales plan - Operating plan - Master production schedule - Material requirement plan - Production scheduling - Production control reports

Total : 45 Hours

Reference Books

21GM24 BUSINESS ANALYTICS 3 0 0 3

UNIT 1: Overview of Business Analytics 9 Hours
Big Data - Data Science - Business Intelligence – Business Analytics; Applications of Analytics - Types of Analytics Techniques- Descriptive analytics, Diagnostic analytics, Predictive analytics, Prescriptive analytics; Machine Learning Algorithms; R and R studio environment - Basics of R – Variables Types, Basic Operators, Functions, Vectors, Lists, Data Frame, R Packages

UNIT 2: Exploratory Data Analysis and Data Visualization 9 Hours
Need for Exploratory Data Analysis - Analytics Process Model; Data Pre-processing Steps - Transforming variables, Creating dummy variables, One hot encoding; Data Visualization Techniques - Univariate Plots - Histogram, Bar Plots, Pie Chart, Box and Whisker Plot, Density Plot; Multivariate Plots - Strip Chart, Scatter Plot, Heat Maps, GGPlots in R

UNIT 3: Unsupervised Learning Algorithms 9 Hours

UNIT 4: Supervised Learning Algorithms: Linear and Logistic Regression 9 Hours
Supervised Learning Algorithm Techniques - Regression - Multiple linear regression- Interpretation of Multiple Linear Regression Coefficients, Coefficient of Determination, Model performance measures; Classification Technique - Logistic Regression, Binary Logistic Regression, Sigmoid function Interpretation of Logistic Regression Parameters, Odds ratio, Variable selection

UNIT 5: Supervised Learning Algorithms: KNN and Decision Tree 9 Hours
Frequency Based Algorithm - K-Nearest Neighbours - Similarity based on distance function. Select Appropriate K Value; KNN Model Building - Evaluating Model Performance; Decision Tree - Tree structure, Criteria for splitting the Decision Node - Classification and Regression Technique (CART)- Control Parameters, Pruning the tree, Important Variables, Insights from Decision Rules

Total : 45 Hours

Reference Books
### 21GM25 BUSINESS LAW

**UNIT 1: Law of Contracts**

- **General Principles of Contract**
- Types of Contracts - E-Contracts
- Important clauses in contracts – Remedies for breach of contract – Alternative Dispute Resolutions systems
- Digitalization of Banking systems – E-payments, Cheques, Promissory note and Bill of Exchange – It’s Legal challenges and Remedies
- Banking Ombudsman – Consumer Protection Act: Overview

**UNIT 2: Company Law and Goods and Services Act**

- Corporate Tax Planning, Corporate Taxes and Overview of Latest Developments in Indirect tax Laws relating to GST

**UNIT 3: Intellectual Property Rights and Competition Act**

- Patent, copy right, Trade Marks and Geographical Indications – Law and Procedure;
- Anti-competitive agreements- Abuse of Dominant Position – Combination – Role of Competition Commission of India
- IT Act 2000 and 2002, Cyber Laws

**Reference Books**


### 21GM26 INFORMATION SYSTEMS MANAGEMENT

**UNIT 1: Organizations and Role of Information System**

- Practical: Developing a business process model for an organization and identifying the process to be reengineer - Developing as-is and to-be process model

**UNIT 2: Managing Data Resources**

- Databases and Information Management – Database Management Systems – Using Databases to Improve Business Performance and Decision Making – Data Warehousing and data mart framework and the usage Managing Data Resources
- Practical: Design and create a database model for an organization – Using a query language/tool to perform data manipulations (Insertion, Update, Deletion and Retrieval)

**UNIT 3: Functional Business System**

- Practical: Design a TPS for a business process in an organization – Demonstrate the TPS using a live application

**UNIT 4: Internet-Enabled Business**

- Practical: Developing and managing a E-Commerce Web Store using Open Source Software

**UNIT 5: Decision Support Systems**

- Decision making and Information Systems – The decision making process – Automated decision making – Decision support Models - Business Intelligence – New IT initiatives - Pervasive Computing, Cloud computing, Advancements in AI, IoT, Block chain, Crypto currency, Quantum computing
- Practical: Evaluate the different software tools used in Decision Support System and compare the software features with the business requirements – Find the best software that might fit small medium enterprise.

**Reference Books**

21GM27 EMOTIONAL INTELLIGENCE FOR MANAGERS

UNIT 1: Understanding and Developing Emotional Intelligence
- Emotional Intelligence and its constituents; Self-Awareness – Developing Self Awareness - Four steps to Emotional Intelligence
- 5 Hours

UNIT 2: Applying Emotional Intelligence for Intrapersonal Success
- Emotion Regulation - Managing Anger - Managing Fear – Managing Stress
- 5 Hours

UNIT 3: Applying Emotional Intelligence for Interpersonal Success
- Emotional Intelligence and Communication - Developing Interpersonal Expertise - Managing conflicts.
- 5 Hours

Total: 15 Hours

Reference Books

21GM28 BUSINESS BEYOND BORDERS

The business beyond borders is a two week study abroad program jointly offered with a university at a foreign location. The program will be led by faculty members from PSGIM. The objective of the program is to give an international exposure to students of business, where they experience the way of business and culture of the country. They are encouraged to understand and appreciate all the facets of the country that will assist in development of their intellectual, professional and personal skills. Each student is expected to document the learning in the form of a written report and also make an oral presentation to a panel of examiners, on the basis of which they will be evaluated.

21GM29 ACTIVE LEARNING PROGRAM - 2

UNIT 1: Team Dynamics
- Develop ways to identify an ideal team member - Handling inter-personal issues – Task planning and execution challenges.
- 10 Hours

UNIT 2: Critical Thinking
- Managing task complexities – Breaking into tasks – logical thinking and task execution – Identify Conflict
- 10 Hours

UNIT 3: Team Effectiveness
- Managing team conflict – Arriving at consensus - Feeling of oneness - Task achievement and member satisfaction.
- 10 Hours

UNIT 4: Career Empowerment
- Career Empowerment Module
- 30 Hours

Total: 60 Hours

SEMESTER III

21GM31 SUMMER INTERNSHIP

Course Requirements
a) Students will have to undergo a summer internship for minimum eight to ten weeks in a company/firm/research organization at the end of Semester II.
b) All students placed for summer internship through campus placement process are mandated to attend the same and cannot change unless prior permission is taken.
c) Students will be assigned a faculty mentor for the entire period. Stage-wise approval as to the intended company, the start and finish dates and periodic reports has to be confirmed and completion certificates should be obtained and submitted to the mentor.
d) The internship assessment is a multi-stage sequential process.
e) At the end of the internship and in the beginning of the Semester III, students have to submit an internship report and make a presentation in which they will present their work to examiners from the industry and academia for evaluation. A detailed guideline and instruction manual will be given to students at the end of Semester II.

**21GM32 STRATEGIC MANAGEMENT**

**UNIT 1: Strategic Management Overview**
Industrial organization model-Resource based model – Vision – Mission – Competency- Core-competency-Distinctive competency-Fortune at the bottom of the pyramid -- External environmental analysis-Global- Legal and political factors, New business models for the new economy

**UNIT 2: Internal Environment, Business Level Strategy**
Resources – Capabilities-Criteria of sustainable competitive advantage-Value chain analysis – Outsourcing-Economies of scale- Cost leadership strategy – Differentiation – Focus – Integration -Flexible manufacturing system- Total quality management

**UNIT 3: Corporate Level Strategy**
Levels of diversification-Operational relatedness-Corporate relatedness-Vertical Integration-Merger-Acquisition- Joint Venture-Strategic alliance –Restructuring – Downsizing – Downscoping- Leveraged buy out

**UNIT 4: Strategic Tools**
External factor evaluation matrix-Internal factor evaluation matrix- Competitor profile matrix- SWOT-TOWS- IE matrix-Grand strategy matrix- Boston consultancy group matrix- Quantitative strategic planning matrix(QSPM), Leveraging technology for strategic decision making

**UNIT 5: Global Strategy**
Porter’s determinants of national advantage-International strategies-International corporate level strategies-Choice of International Entry mode- Strategic alliance- Types of strategic alliance-Business level co-operative strategy

Total : 90 Hours

**Reference Books**

**SEMESTER IV**

**21GM41 ENTREPRENEURSHIP AND NEW VENTURE CREATION**

**UNIT 1: Entrepreneurship - Overview**
The Entrepreneur – concept and nature, entrepreneurial decision process, characteristics, attitude, competencies, and motivation, achievement motivation, skills, knowledge, creativity and innovativeness. The MSME landscape.

**UNIT 2: New Venture Creation**
Introduction to new venture creation, overview of a lean business model canvas, identifying interested stakeholders, Idea Generation, Initial feasibility analysis.

**UNIT 3: The Market and Operational Aspects**
Target customer, their problems, demographics, personality traits and behaviour. Market opportunity, market size, growth rate, growth potential, market trends, opportunities, value proposition canvas. Product/service, manufacturing, resources, mode of sales , sales process , go-to-market strategy, concept, prototype, Product Road Map, existing and likely competition, barriers to entry for new competitors, key distribution and technology partners.

**UNIT 4: Revenue Model**
Revenue model, Average no of customers per month ,Average payment by a customer ,customer acquisition costs, Total Revenue , Expenditure plan, Financial Plan Template, Projected financial statements

**UNIT 5: Financing Options and Preparing The Pitch**
Sources of funding for startups, IPR process, Legal aspects relating to the startup , team formation, scalability of the model, social and ethical aspects of the business, Winning negotiations, elevator pitch, exit strategy

Total: 60 Hours
**Reference Books**

**ELECTIVES**

**FINANCE ELECTIVES**

**21GA01 APPLIED FINANCIAL ECONOMETRICS**

**UNIT 1: Univariate Stationary Time-Series Models**
9 Hours
Introduction to Stochastic process, stationary processes, Wold representation theorem, autocovariance functions, autocorrelation and partial autocorrelation, auto regressive and moving average models, condition for stationary and invertible process, Box-Jenkins approach, forecasting.

**UNIT 2: Univariate Nonstationary Processes**
9 Hours
Nonstationary process, deterministic and stochastic trends, Integrated process and random walk, Random walk with drift, Unit root process, test for unit root, Dicky fuller tests, ARIMA process. Fractional integrated process.

**UNIT 3: Modelling Volatility**
9 Hours
Volatility – meaning and measurement, Volatility clustering, Econometric models of volatility, ARCH Model, GARCH model and its various extensions, testing for ARCH/GARCH effects.

**UNIT 4: Multivariate Stationary**
9 Hours
Vector autoregressive models, Granger Causality, impulse response function, Variance Decomposition.

**UNIT 5: Multivariate Non-stationary processes**
9 Hours
Introduction to cointegration, testing for cointegration: Single-equation approaches: Eagle Granger method, Johansen test for cointegration, Vector error correction model.

**Total:** 45 Hours

**Reference Books**

**21GA02 BANKING AND FINANCIAL SERVICES**

**UNIT 1: Introduction to banking and non-banking companies**
9 Hours
Indian Banking system – commercial banks-types-role-regulations and recent trends. Non-Banking Financial companies- types- RBI guidelines- Performance of BFSI. Trends and progress of financial services industry in India.

**UNIT 2: Retail financial services**
9 Hours
Deposits – types and their features, Debit card. Lending- personal loan, mortgage loan, Consumer loan, credit card services, investment services and wealth management- insurance, mutual fund, demat, etc., and advisory services

**UNIT 3: corporate financial services**
9 Hours
Over draft, term loan, Hire-purchase, Leasing, Factoring, Bill discounting, forex services, bank guarantee, custodian services

**UNIT 4: Management of Banking and Non-Banking Finance Companies**
9 Hours

**UNIT 5: Fintech in financial services**
9 Hours
Online banking, Mobile banking, digital payment, ATM, Core banking, application of AI in financial services, role of Blockchain technology, collaboration of fintech companies and Financial Institutions

**Total:** 45 Hours

**Reference Books**

21GA03 EMPIRICAL RESEARCH IN FINANCE 3 0 0 3

UNIT 1: Theories of Financial Management 9 Hours
Capital Structure – MM Theory, Trade Off Theory, Signalling Theory, Dividend Theories, Cost of Capital, Valuation – Pecking Order

UNIT 2: Capital Market Theories 9 Hours
Market Efficiency Theories, Random Walk Theory, Portfolio Theory, CAPM, Arbitrage Pricing Theory, Multifactor Models

UNIT 3: Option Valuation Models 9 Hours
Option and their Valuation, Black Scholes Model and Binomial model

UNIT 4: Theories of International Finance 9 Hours
Purchasing Power Parity Theory – International Fisher Theory – Interest Rate Parity Theory

UNIT 5: Theories of Behavioural Finance 9 Hours
Forward Rate Agreements – Interest Rate Swaps – Interest Rate Futures- Options – Credit Default Swap – Credit Options – Credit Linked Notes- Total Return Swaps – Credit Derivative Pricing

Total: 45 Hours

Reference Books

21GA04 FINANCIAL ANALYTICS 3 0 0 3

UNIT 1: Data in Finance 9 Hours
Financial Analytics – Need - Data in Finance - Sources of Financial Data – Pre-processing of Financial Data - Applicability of Tools (Excel, SPSS, R, Python) for Exploratory Data Analysis

UNIT 2: Simple Predictive Models 9 Hours
Simple Predictive Models for Finance – Linear Regression – Ridge Regression – Lasso Regression – Logistic Regression – Linear Discriminant Analysis – Applications in Finance

UNIT 3: Advanced Predictive Tools 9 Hours
Advanced Predictive Tools - Naive Bayes Model - KNN - Neural Networks – Decision Tree- Ensemble Models – Support vector Machines – Applications in Finance

UNIT 4: Time Series Forecasting 9 Hours

UNIT 5: Prescriptive Analytics 9 Hours
Prescriptive Analytics – Need - Linear Programming – Sensitivity Analysis – Optimization Techniques – Goal Programming

Total: 45 Hours

Reference Books

21GA05 FINANCIAL DERIVATIVES 3 0 0 3

UNIT 1: Forwards and Futures 9 Hours

UNIT 2: Options 9 Hours

UNIT 3: Option Trading Strategies
9 Hours
Covered Call – Protective Put – Strangle – Straddle – Bull and Bear Call spread – Call Back Spread - Bull and Bear Put Spread – Condor – Butterfly – Collar

UNIT 4: Option Pricing
9 Hours

UNIT 5: SWAPS
9 Hours
Introduction – SWAP Facilitators – Interest Rate Swaps – Currency Swaps –Comparative Advantage using Swaps - Credit Default Swaps – Forward Rate Agreements – Total Return Swaps

Total: 45 Hours

Reference Books

21GA06 FINANCIAL RISK MANAGEMENT

UNIT 1: Introduction to Risk Management
9 Hours
Risk, Types of Risk, Objective of Risk Management, Sources of Risk, Measurement of Risk

UNIT 2: Identifying and Quantifying Financial Risk
9 Hours
Risk Identification and Assessment, Risk Response, Risk Control Implementation, Risk Exposure. Quantifying Tools – Regression Analysis, Value at Risk and Scenario Analysis

UNIT 3: Risk Aversion & Management Technique
9 Hours
Risk Avoidance, Loss Control, Risk Retention, Risk Transfer, Value of Risk Management, Pooling and Diversification of Risk

UNIT 4: Introduction to Insurance
9 Hours

UNIT 5: Insurance as a Risk Management Technique
9 Hours

Total: 45 Hours

Reference Books

21GA07 FIXED INCOME SECURITIES

UNIT 1: Introduction to Debt Instruments
9 Hours

UNIT 2: Bond Valuation
9 Hours

UNIT 3: Term Structure of Interest Rates
9 Hours
Yield Curve – Bootstrapping - Definitions and Properties of Term structure – Theories of Term structure – Pure expectation theory- The pure risk premium theory- The market segmentation theory – The biased expectation theory

UNIT 4: Duration
9 Hours
Introduction and Definition – Calculating the Duration of a Coupon Paying Bond – Computing Duration on Dates other than Coupon Dates – Modified Duration – Rupee Duration – Price value of a Basis Point – Portfolio Duration – Limitations
UNIT 5: Hedging Interest Rate Risk and Credit Risk
Forward Rate Agreements – Interest Rate Swaps – Interest Rate Futures- Options – Credit Default Swap – Credit Options – Credit Linked Notes- Total Return Swaps – Credit Derivative Pricing

Total: 45 Hours

Reference Books

21GA08 INTERNATIONAL FINANCIAL MANAGEMENT

UNIT 1: Foreign Exchange
Foreign Exchange Market - Rates and Quotations - Spot Rate - Forward Rate - Bid Ask Spread - Arbitrage in Foreign Exchange Markets

UNIT 2: International Flow of Funds
Key Components of Balance of Payments – International Trade Activity – International Trade Flows influenced by Economic Factors – International Capital Flows - Participants - Types - Direct and Indirect (FDI, FIL, ECB’s, FEMA and Others) - Networks for International Transaction

UNIT 3: Exchange Rate Theories
Theories of Exchange Rate Determination and Problems (Interest Rate Parity Theory, Purchase Power Parity Theory, Fisher Effect) – Comparison of IRP, PPP and FE - SWAP Transaction

UNIT 4: Foreign Exchange Exposure
Foreign Exchange Risk - Types of Exposure - Techniques for Managing Exposure Related Risks

UNIT 5: International Financing

Total: 45 Hours

Reference Books

21GA09 INVESTMENT AND PORTFOLIO MANAGEMENT

UNIT 1: Investment Alternatives and Mechanics of trading

UNIT 2: Fundamental Analysis

UNIT 3: Technical Analysis
Candle Sticks – Chart Patterns and Gap Theory - Oscillators – MACD, RSI, ROC, Bollinger Band, ADX and Alligator

UNIT 4: Portfolio Theory & Analysis
Markowitz Portfolio Theory, Sharpe Single Index Model, CAPM & APT, Portfolio - Risk and Return

UNIT 5: Portfolio Management
Portfolio Process – Portfolio Objective and policy – Portfolio Selection – Implementation and Monitoring – Evaluation and Revision

Total: 45 Hours

Reference Books

21GA10 INVESTMENT BANKING

UNIT 1: Investment Banking Paradigm

UNIT 2: Issue Management

UNIT 3: Disinvestment and Corporate restructuring

UNIT 4: International Financial Instruments

UNIT 5: Regulations and Ethics
Regulatory framework of Investment Banking, Stock Exchanges & Share Brokers - Recent Developments. Legal, ethical and governance issues in investment banking

Total: 45 Hours

Reference Books

21GA11 PROJECT APPRAISAL AND FINANCE

UNIT 1: Project Financing
Project financing- Concept and Meaning – Unique characteristics – Requirements – Rationale for project financing - Softwares for Project Management

UNIT 2: Sources of Project Financing
Means of project financing – Sponsors’ -lenders’ and other stakeholder perspective – project financing structures - Project cash flow determination and financing options – fund vs non-fund financing – formulating financing mix – Features of debt structure – Debt service covenants

UNIT 3: Project Feasibility Analysis

UNIT 4: Risk Analysis

UNIT 5: Real Option Valuation
Real option evaluation of projects – concept and application – Techniques - Simple option valuation – option to expand, contract, abandon – Case studies.

Total: 45 Hours

Reference Books
21GA12 VENTURE CAPITAL AND PRIVATE EQUITY 3 0 0 3

UNIT 1: Introduction to Venture capital and private equity 9 Hours
Venturecapital,Angelfinanciers,PrivateEquity,Hedgefunds,theirclassificationanddifferentcharacteristics.
HistoryofVenturecapital,Angelfinanciers,PrivateEquityinIndia.Differentmodels-of-VC and Private equity

UNIT 2: Working procedures 9 Hours
The Venture capital cycle, Opportunity recognition, Key parties involved, value of opportunity, negotiation on terms, harvest or exit investment.
Initial screening, due diligence, risk return, Return on investment from cash flows, breakeven point

UNIT 3: Valuation of companies 9 Hours
Understanding the nature of business, Method of valuation and its role throughout the venture capital process. Valuing companies with options. Real options. Differences in approach and evaluation process of PE, angel financiers, Venture capitalists with Banks and financial institutions.

UNIT 4: Deal structuring and Exit 9 Hours

UNIT 5: Performance and Regulatory framework 9 Hours
Performance of venture capital: sector wise and year wise. SEBI regulations, Ethics and code of conduct for venture capitalists and private equity

Reference Books

HUMAN RESOURCE ELECTIVES
21GB01 BEHAVIOUR FOR MANAGERIAL EFFECTIVENESS 3 0 0 3

UNIT 1: Behavioural Basics 9 Hours

UNIT 2: Assessing Behaviours 9 Hours
Analyzing behaviour, assessing behaviour, Luthans & Kreitner Model, Perception: Linkage between perception and organizational outcomes, Linking perception and attribution to decision and behaviour, perceptual influence to have productive behaviour, Impression Management.

UNIT 3: Managing Interpersonal Behaviour 9 Hours
Functional and Dysfunctional job behaviour, influencing behaviour of subordinates, Understanding the forbidden behaviour of managers, Empowering subordinates, Identifying managerial talent among subordinates, Effective management criteria, Post performance Feedback.

UNIT 4: Team Handling Behaviour 9 Hours
Retention, Employee engagement, Managing ethical issues dealing with team, behaviour for handling conflicts, Negotiation skills, Job challenges for team, Role of organizational design in supporting effective teams, Creating structures to support effective behaviour.

UNIT 5: Managerial Behaviour for Organizational Efficiency and Self Enhancement 9 Hours
Self-directed learning, Self-Development - Knowledge Management - Culture for organizational creativity, Creativity Techniques.

TOTAL: 45 Hours

Reference Books
UNIT 1: Compensation Management
Compensation – Meaning, Objectives of Compensation, Compensation and Non-compensation Dimensions, Compensation System Design Issues, Compensation Approaches, Strategic Issues and Internal Alignment. 9 Hours

UNIT 2: Job Evaluation
Compensation Strategy at Micro Level, Concept of Equity, Job Evaluation - Methods of job evaluation, Process of Job Evaluation, Problems Involved in Job Evaluation. 6 Hours

UNIT 3: Wages and Salary Administration
Concept of wage Code on Wages - Fixing minimum wage, Payment of Wage and Bonus; Compensation Benchmarking, Concept of Salary Structure, Methods of Payment - Factors Affecting Pay Levels. Designing Pay Structures, Different Types of Pay Structures, Designing Pay Ranges and Bands. Income tax act and its impact on salary structure, Deductions and allowances - Executive Compensation, Competency based Compensation, Skill-based Pay and Pay Banding - International Remuneration - Expatriate Compensation. 12 Hours

UNIT 4: Incentive Schemes
Variable Pay - Types of Incentive Schemes, Wage Incentive Plans, Pay for Performance Plans, Profit Sharing and Co-Partnership. Employee Stock Ownership Plans (ESOP), Team-based Pay. 9 Hours

UNIT 5: Fringe Benefits And Pension Plans

Total: 45 Hours

Reference Books

UNIT 1: Introduction to Conflict
Understanding Conflict – Different Schools of Thought, Components of Conflict, Perspectives and Types of Conflict – Intra-personal, Interpersonal and Group/Team. 10 Hours

UNIT 2: Sources of Conflict
Cognitive Dissonance, Neurotic Tendencies, Relationship Rules, Personality, Gender and Age Related Issues, Cross-Cultural Issues, Role Incompatibility, Stress, Difficult Bosses and Colleagues, Other Sources of Group and Organizational Conflict. 7 Hours

UNIT 3: Approaches to Managing Conflict
Thomas Kilmann Approach to Conflict Resolution, Behavioural Style and Conflict Handling, CosierSchank Model of Conflict Resolution, Dealing with Difficult Bosses, Colleagues and Subordinates, Strategies to Resolve Team Conflicts. 9 Hours

UNIT 4: Skills for Managing Conflict
Effective Listening and Dialogue Skills, Creativity and Change in Conflict Management, Conflict Prevention and Early Resolution, Evaluating Cost of Workplace Conflict, Understanding Impact of Constructive Conflict. 9 Hours

UNIT 5: Negotiation and Mediation
Introduction to Negotiation, Types of Negotiation, Dimensions of Negotiation, Negotiation Steps, Negotiation Tricks and Traps, Value Creation in Negotiation, Mediation, Responsibilities of Mediator, Types of Mediation, Why Negotiations and/or Mediations Fail? 10 Hours

Total: 45 Hours

Reference Books
**21GB04 LABOUR LEGISLATION AND INDUSTRIAL RELATIONS**

<table>
<thead>
<tr>
<th>UNIT 1: The Occupational Safety - Health and Working Conditions Code 2020</th>
<th>9 Hours</th>
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<tr>
<th>UNIT 2: The Code on Wages 2019</th>
<th>8 Hours</th>
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<table>
<thead>
<tr>
<th>UNIT 3: The Code on Social Security 2020</th>
<th>8 Hours</th>
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<tbody>
<tr>
<td>General Features - Employees' Provident Fund - Employees' State Insurance Corporation - Gratuity - Maternity Benefit - Social Security And Cess In Respect Of Building And Other Construction Workers - Unorganized Workers - Gig Workers And Platform Workers - Employment Information And Monitoring</td>
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<thead>
<tr>
<th>UNIT 4: Industrial Relations Code 2020</th>
<th>10 Hours</th>
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<tr>
<th>UNIT 5: Other Relevant Acts and Processes</th>
<th>10 Hours</th>
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| Total: | 45 Hours |

**Reference Books**


**21GB05 LEADING ORGANIZATIONAL CHANGE AND DEVELOPMENT**

<table>
<thead>
<tr>
<th>UNIT 1: Organizations and their Changing Environments</th>
<th>10 Hours</th>
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<tbody>
<tr>
<td>The historical context for change, Environmental pressures for change, Internal organizational change drives. Types of organizational change, Organization renewal systems approach, sociotechnical system and future shock.</td>
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</table>

<table>
<thead>
<tr>
<th>UNIT 2: Change: A Diagnostic Approach</th>
<th>10 Hours</th>
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<tbody>
<tr>
<td>The Six-Box organizational model, the 7-S framework. The star model, organizational strategy and change, the cultural web, organizational structure and change. Diagnosing readiness for change, Red flags in diagnosis.</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>UNIT 3: The Leadership of Change</th>
<th>7 Hours</th>
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<tbody>
<tr>
<td>Management and leadership, theories of change leadership, change leader or change managers, change roles, leadership style and change, dealing with Resistance to change.</td>
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<thead>
<tr>
<th>UNIT 4: Change Management Process and Contingency Approaches</th>
<th>8 Hours</th>
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<tbody>
<tr>
<td>Approaches to managing change, transformation failure, DICE and ADKAR model, stage model, process perspectives on change, Contingency approaches to change management.</td>
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<table>
<thead>
<tr>
<th>UNIT 5: Alternative Approaches to Managing Change</th>
<th>10 Hours</th>
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</thead>
<tbody>
<tr>
<td>Organizational development, engaging in large scale change, Appreciative enquiry, positive organizational scholarship, dialogic organizational development, managing change from a sense making perspective.</td>
<td></td>
</tr>
</tbody>
</table>

| Total: | 45 Hours |

**Reference Books**

21GB06 LEARNING AND DEVELOPMENT 3 0 0 3
UNIT 1: Learning Styles and Strategies 9 Hours

UNIT 2: Role Analysis and Training Need Analysis 9 Hours

UNIT 3: Designing Training and Development 9 Hours
Principles of training design -defining the objectives – make / buy Decision – selecting the trainers – preparing lesson plan, training methods, materials – scheduling

UNIT 4: Implementing T & D Programs 9 Hours
Training delivery methods, principles involved in selection of various methods – Techniques of training at different levels – Skills of an effective trainer – e learning and use of technology in training

UNIT 5: Evaluation and Transfer of Training 9 Hours

Total: 45 Hours

Reference Books

21GB07 MANAGING GLOBAL WORKFORCE 3 0 0 3
UNIT 1: Introduction to IHRM and Cross Culture Management 10 Hours
Overview of International Human Resources management, External & Internal forces influencing global workforce management, changes & challenges in global labour market, culture, models of culture and impact of culture in various business contexts such as mergers and acquisitions.

UNIT 2: Sourcing Human Resources for Global Markets 10 Hours
Competitive strategies for Multinational corporations, linking human resources management to competitive strategy and organization structure. The role of HR planning in carrying out MNC strategy for both short and long term. International work arrangement, key factors affecting global staffing.

UNIT 3: International Training, Development & Careers 10 Hours
Role of training in on - assignment performance. Components of pre-departure training, effectiveness and trends in international training & developing Repatriation, factors affecting re-entry, Designing a repatriation program.

UNIT 4: Global Performance Management and Compensation 10 Hours

UNIT 5: International Industrial Relations 5 Hours
Issues in international industrial relating and the policies & practices of MNE's,strategies adopted by trade unions when dealing with MNE's. Recent trends and uses in the global work force context.

Total: 45 Hours

Reference Books

21GB08 PEOPLE ANALYTICS 3 0 0 3
UNIT 1: Introduction to HR Metrics and Excel Charting 11 Hours
Evolution and timeline of HR Analytics - Types of Analytics - HR Analytics Applications - Summarizing & Reporting HR Data using Business Intelligence tools (Importing Data, What-if Scenarios, Pivot Tables, Representation through Funnel Chart, Bullet Chart, Pyramid, Thermometer Chart, Dynamic Charts etc.)

UNIT 2: Recruitment and Diversity Analytics 9 Hours
Social Media for Recruitment and Employer Branding, Diversity Index, Offer Reject and Renego (Logistic Regression), Attrition (Random Forest Algorithm), Channel Efficiency, Recruitment Metrics

UNIT 3: Training and Development & Workforce Deployment Analytics 8 Hours
Training Outcome Analysis, Training hours and cost metrics, ROI calculation, Employee Profiling, Turnover Index, Natural Language Processing in HR Analytics – Uncovering employee insights

UNIT 4: Talent Retention and Career Progression Analytics 8 Hours
Retention Index, Voluntary and involuntary Turnover, Career Path Index, Succession Readiness index, Employee Satisfaction and Engagement Surveys, Gamification for Employee Engagement

UNIT 5: HR Audits And Visualisation of HR Data 9 Hours
HR Audit Process, Recruitment and Selection Process Audit, Statutory Compliance Audit, Benchmarking, Design Thinking Principles for Dashboards, KPI Dashboard, KPI Scorecard, HR Balanced Scorecard

Total: 45 Hours

Reference Books
5. Shen Ng, M, “Predictive HR Analytics, Text Mining & Organizational Network Analysis with Excel” Independently Published, 2019.

21GB09 PERFORMANCE MANAGEMENT 3 0 0 3

UNIT 1: Introduction to Performance Management 7 Hours

UNIT 2: Measurement and PM Cycle 10 Hours

UNIT 3: Performance Planning and Monitoring 10 Hours

UNIT 4: Performance Assessment and Review 9 Hours

UNIT 5: Managing Team and Employee Development 9 Hours
Definition and Importance of Teams – Types of Teams and Implication for Performance Management – Purpose and Challenge of Team performance Management – Rewarding Team Performance – Role of Performance Coaching – Process and Styles

Total: 45 Hours

Reference Books

21GB10 TALENT ACQUISITION AND MANAGEMENT 3 0 0 3

UNIT 1: Introduction to Talent Acquisition 10 Hours

151
### Introduction to Talent Acquisition, Strategic Alignment and HR Planning, HR Planning, Assessing Staffing Need Analysis, Environmental scanning, Forecasting HR requirements and availabilities-demand and supply, Preparing Action Plans – Managing Shortage and Surplus, Best practices & Trends in Talent Acquisition, Challenges in Talent Acquisition.

#### UNIT 2: Attracting Talent
10 Hours

#### UNIT 3: Acquiring Talent
10 Hours
Interviewing – Nature and Purpose, Interviewing types and choice of appropriate method based on Needs - Virtual interviews for remote hiring - Interview content- Measurement of attributes and behaviour during Interview, Behavioural Event Interviewing – Assessing the effectiveness of Talent Acquisition.

#### UNIT 4: Engaging Talent
8 Hours

#### UNIT 5: Role of Information Technology in Talent Acquisition
7 Hours
Introduction, Role of Information Technology in Talent Acquisition, Talent acquisition and hiring solutions, Creating Business Value through Information Technology, Impact of Social Media, Mobile apps, Cloud and Big data in Talent Acquisition.

Total: 45 Hours

### Reference Books

### MARKETING ELECTIVES

#### 21GC01 BRAND MANAGEMENT

<table>
<thead>
<tr>
<th>UNIT</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>1</td>
<td>1: The foundation &amp; strategic implications of brand building</td>
<td>9</td>
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<tr>
<td></td>
<td>Brand- Branding – Brand Management – Product vs. Brand – Brand Equity</td>
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<td></td>
<td>– Measuring brand equity – Customer-Based Brand Equity Models - How</td>
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<td></td>
<td>brands create value for customers and company</td>
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<td>2</td>
<td>2: Building the brand</td>
<td>10</td>
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<td></td>
<td>Brand Identity – Developing Brand Identity – Protecting brand identity</td>
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<td></td>
<td>– Managing Brand Identity (Rebranding) – Brand Positioning –</td>
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<td></td>
<td>Developing Brand Positioning strategy – Repositioning</td>
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<td>3</td>
<td>3: Launching the brand</td>
<td>8</td>
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<td></td>
<td>Brand Plan Process – Business review – Drivers &amp; Inhibitors –</td>
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<td></td>
<td>Strategic Questions – Goals - Preparing a Brand Plan – Execution –</td>
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<td>Brand communication plan – Communication strategy – Target market –</td>
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<td>Brand idea – Support points – Desired response – Media options</td>
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<td>4</td>
<td>4: Managing and Growing the brand</td>
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<td>Brand Architecture and Portfolio Management – Brand Extension –</td>
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<td>Managing Brand Extensions - Brand Revitalization/Rejuvenation –</td>
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<td>Managing global brands</td>
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<td>5</td>
<td>5: Measuring &amp; Monitoring Brand Performance</td>
<td>8</td>
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<td></td>
<td>Brand Audit – Brand Valuation – Brand Valuation Methodologies</td>
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<td></td>
<td>Total:</td>
<td>45</td>
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</table>

Total: 45 Hours

### Reference Books
5. Tapan K Panda, Product and brand Management, Oxford, 2018

#### 21GC02 CONSUMER BEHAVIOUR

<table>
<thead>
<tr>
<th>UNIT</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>1: Fundamentals of Consumer Behaviour</td>
<td>9</td>
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<tr>
<td></td>
<td>The Foundations of Consumer Behaviour: Meaning, Personal and</td>
<td></td>
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<td></td>
<td>Organizational consumers, Consumer's buying behaviour, model of</td>
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<td></td>
<td>Consumer decision making, marketing concepts. Consumer needs and</td>
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<td></td>
<td>motivation: Meaning, positive and negative, rational-vs.-emotional,</td>
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<td>dynamic nature of motivation, frustration, arousal of motives, types</td>
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<td></td>
<td>and systems of needs.</td>
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Total: 9 Hours
UNIT 2: Personality and Perception Theories
Personality and self-concept: Definition, Theories, personality and consumer behaviour, self and self-images. Perception: Elements, subliminal perception, the dynamics, consumer imagery, perceived price, quality, and risk.

UNIT 3: Learning and Attitude Formation and Change
Learning and involvement: Meaning, motivation, cues, response, and reinforcement, learning theories. Attitude formation and change: Types of attitudes, structural models, formation, strategies of attitude change.

UNIT 4: Social Influences in Social Class and Culture
Social influences on buyer behaviour and Social Class and consumer behaviour: Communication via the media, Reference Groups, social class, measurement of social class. The influence of family, culture & sub culture on consumer behaviour: definitions, measurement of culture, ethnic, religious, geographic and regional, racial, age and gender as a subculture.

UNIT 5: Consumer Decision Making Models
Decision Making: Definition, Four views, model of consumer decision making, opinion leadership, dynamics of OL process, Organizational Buyer Behaviour: Nature of organizational buying process influences on organizational buyer behaviour, organizational buying decisions.

Total: 45 Hours

Reference Books

21GA03 CUSTOMER RELATIONSHIP MANAGEMENT

UNIT 1: Customer Centricity
CRM – Need for CRM – Benefits of CRM – CRM in the digital age - Customer Centricity – Characteristics of customer centric companies – Developing a customer centric company

UNIT 2: Customer Experience

UNIT 3: Customer Analytics
Customer Churn – Customer Acquisition Cost – Revenue Churn – Customer life time value – Recency, Frequency and Monetary – Customer Profitability Analysis

UNIT 4: Customer Satisfaction & Loyalty
Net Promoter Score – Customer Happiness Index (CHI) – Customer Effort Score – Customer Loyalty and Measuring customer loyalty – Exploring loyalty and profitability relationship – Analyzing loyalty programs effectiveness - Marketing Automation for better customer engagement and retention

UNIT 5: Contemporary tools for CRM

Total: 45 Hours

Reference Books
5. Peter Fader and Sarah Tomes, “The Customer Centricity Playbook”, The Wharton Press, 2018

21GC04 INBOUND MARKETING

UNIT 1: Inbound & Content Marketing
The age of SMAAC and paradigm shifts in Marketing - Inbound Marketing Philosophy- Inbound Vs. Digital Vs. Outbound Marketing - Inbound Marketing Methodology - Inbound Marketing in Practice - CLV - Introduction to Content Marketing - Content Types/Formats - Content Marketing framework - Content Marketing Metrics - Tools for Content Marketing – Effective Blogging

UNIT 2: Search Engine Optimization

153
### Reference Books


### 21GC05 INTEGRATED MARKETING COMMUNICATION

<table>
<thead>
<tr>
<th>UNIT 1: Marketing Communications - Overview</th>
<th>10 Hours</th>
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<tr>
<th>UNIT 2: IMC Planning Process</th>
<th>8 Hours</th>
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<tbody>
<tr>
<td>Communication Objectives and Budgeting - DAGMAR Approach - Consumer information processing and decision making - Creativity and Big idea - positioning statement - creative Brief</td>
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<table>
<thead>
<tr>
<th>UNIT 3: Marketing Communications Management and Design</th>
<th>12 Hours</th>
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<tbody>
<tr>
<td>Message strategy and Execution frame work - copy writing and content creation for print, broadcast and digital media - Design principles - layouts - Art direction and production - Media and Media planning - Media scheduling issues - Reach and frequency - GRP - Rating and share - Efficiency of media vehicle</td>
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<thead>
<tr>
<th>UNIT 4: Marketing Communication Mix</th>
<th>12 Hours</th>
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<tbody>
<tr>
<td>Broad communication strategies - Sales promotion - Public Relations - Brand publicity - Event sponsorship - Social media and digital marketing options - Mobile engagement - Alternative and non-traditional marketing</td>
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<tr>
<th>UNIT 5: Evaluating Marketing Communications</th>
<th>8 Hours</th>
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<tbody>
<tr>
<td>Economic, social and regulatory aspects in IMC - Plagiarism - Stereotype - STAS impact and measurement - Measuring effectiveness of promotional program - Ad Testing methods - Optimal IMC</td>
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**Total: 45 Hours**

### Reference Books


### 21GC06 MARKETING ANALYTICS

<table>
<thead>
<tr>
<th>UNIT 1: Introduction</th>
<th>9 Hours</th>
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<tbody>
<tr>
<td>Introduction to Marketing Analytics - Evolution of Marketing Data and Analytics timeline - Types of Analytics - Marketing Analytics Applications - Summarizing &amp; Reporting Marketing Data using Excel</td>
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<table>
<thead>
<tr>
<th>UNIT 2: Summarizing Marketing Data</th>
<th>9 Hours</th>
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<tbody>
<tr>
<td>Visualizing Marketing Data using Tableau - Visualizations Using Python &amp; R - Understanding the Metrics across marketing domains</td>
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</table>
Developing Metrics - Flowchart for Metric Creation

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<tr>
<th>UNIT 3: Marketing Models &amp; Strategies</th>
<th>9 Hours</th>
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<tbody>
<tr>
<td>Marketing Models - Marketing Engineering - Segmentation Analytics - Clustering Algorithms - Positioning Analysis - Data Mining applications</td>
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<thead>
<tr>
<th>UNIT 4: Marketing Mix Analytics</th>
<th>9 Hours</th>
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<tbody>
<tr>
<td>New Product development decisions - Pricing the Product - Forecasting the Sales - Allocating the Retail space &amp; Sales Resource - Consumer Attribution Modelling Methods</td>
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<table>
<thead>
<tr>
<th>UNIT 5: Marketing Analytics Applications</th>
<th>9 Hours</th>
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Reference Books

### 21GC07 MARKETING LOGISTICS

#### UNIT 1: Marketing Logistics: An overview
- Concepts, Objectives and Importance of Marketing Logistics: Marketing-logistics interface, Key tasks and value chain activities; Strategic insights: delivering and managing CRM roles and outcomes. creating competitive and marketing advantage; Domestic & International Logistics-The marketing challenges; Special Aspects of Export and import logistics: Documentation, Processes and insights
- 7 Hours

#### UNIT 2: Creating and Managing Customer Centric Supply Chain and Logistics
- Defining customer service & Developing a Market-driven logistics strategy; Value delivery system, Costs of ownership and Customer Profitability management; Cash to cash cycle, lead-time reduction, Value-added time/non-value-added time, Logistics process re-engineering; Mapping internal and external customer satisfaction - Managing risk in the Supply chain; logistics and performance management, Demand-driven supply chains, Mass customisation; building supply chain resilience, ‘agile’ supply chains; Balancing Functional Objectives, Integration of Systems Functions in national and International supply Chains; Connecting the supply chain through shared information; Quick response logistics, Efficient Consumer Response strategies
- 9 Hours

#### UNIT 3: Containerization and Transportation
- Containerization - Genesis, Concept, Classification, Benefits and Constraints; Inland Container Depot (ICD): Roles and Functions - Container Freight Station CFS; Export Clearance at ICD; CONCOR; ICDs under CONCOR; Basics of Transportation, Transportation Functionality and Principles; Multimodal Transport; Modal Characteristics, Modal Comparisons; logistical efficiency - International Air Cargo Transport; Coastal and Ocean transportation, Characteristics of shipping transport- Types of Ships- shipping vessels
- 11 Hours

#### UNIT 4: Warehousing, Packaging and Packing
- Warehouse Management-Types Warehousing; Customs Formalities:- Clearing, Distribution to Units; Distribution and Omni Channel Network Design; Packing and Packaging -Meaning, Functions and Essentials; Packing for Storage- Overseas Shipment-Inland-Transportation- Product content Protection; Packaging - Types: Primary, Secondary and Tertiary- Requirements of Consumer Packaging; Channel Member Packaging and Transport - Packaging - Shrink packaging; Identification codes, bar codes, and electronic data interchange (EDI); Universal Product Code- GS1- Standards- package labels- Symbols used on packages and labels
- 11 Hours

#### UNIT 5: Logistics 4.0 and Challenges for Marketing
- Logistics and Technology –Big data, IoT, AI and Blockchain in Logistics and Supply Chain; Technology embedded freight and transport management; Drone and robotic technologies in logistics- Global Information System GIS and Global Positioning System in logistics; Logistics platforms- a Lean approach for designing - Logistic services outsourcing strategy; Last-mile delivery services and Hyper local platforms, Future scope of E logistics management, ICT in multimodal transport and technological trends.
- 7 Hours

Reference Books

### 21GC08 RETAIL MANAGEMENT

#### 3003
UNIT 1: The World of Retailing
Introduction to Retail - Functions of a Retailer - Retail in India- Theories and Business Models – Internationalization of Retail – Understanding the Retail Customer - Retail strategy.

UNIT 2: Store Location
Store Site Selection - Choosing a Location - Methods of evaluating a trading area - Retail Franchising - Private Labels - Category Management

UNIT 3: Merchandise Management
Basics of Merchandising - Process of Merchandise Planning - Methods of Procuring - Pricing and Evaluating Merchandise Performance

UNIT 4: Managing Retail
Store Operations – Store Layout and Visual Merchandising – Servicing the Retail Customer

UNIT 5: Creating and Sustaining Value
Retail Marketing and Branding - Retail Management Information Systems – Supply Chain Management

Total: 45 Hours

Reference Books

21GC09 SALES AND MARKET DEVELOPMENT

UNIT 1: Fundamentals of Sales Management

UNIT 2: Pre-Sales Process
Understanding Pre-sales process - prospecting - Qualifying - Lead generation - Role of Market research in customer acquisition - Customer solutions - Pre-Sales Requirement Engineering - Business Analysis - Bid management - Proposal and solution development - RFI, RFP, RFQ - Key Account Management - Customer retention through CRM

UNIT 3: Sales Force Management
Sales Organization structure - Recruitment and selection of sales personnel - Job Analysis - Sales Training - Motivating Sales personnel - Sales compensation Plan - Sales contests - Sales presentations - Sales pitch - Negotiations skills - Closing the sale

UNIT 4: Formulating Sales Strategy
Sales forecasting approaches - Forecasting methods - Sales Budget - Sales Territory - Territory design - Control unit - Managing Territorial coverage - Territorial Sales potential - Goal setting process - Administration of Sales Quotas - Information technology role in sales

UNIT 5: Assessing Sales Program
Sales force expenses - Sales Audit - Evaluating and controlling sales people - Sales Analysis - Sales force Automation Ecosystem - Business ethics and Sales management - Social and Legal Responsibilities

Total: 45 Hours

Reference Books

21GC10 SERVICES MARKETING

UNIT 1: Introduction to Services Marketing

UNIT 2: Services Marketing Strategy
### Unit 3: Services Marketing Mix

**9 hours**

The Service-Product continuum, Managing Service Delivery Channels, Managing Channel Conflict, Managing Integrated Marketing Communications, Pricing the Service.

### Unit 4: Services Marketing Mix

**9 hours**

Managing Customers, Educating Customers, Designing the Service Process, Designing the Physical Evidence, Managing People.

### Unit 5: Service Quality & Applications

**9 hours**


**Total:** 45 Hours

### Reference Books


### Decision Sciences Electives

#### 21GD01 Design Thinking

**3003**

**9 Hours**

**UNIT 1:** Introduction to Design Thinking

Types of thinking – Analytical, Intuitive, Deduction, Induction, Abduction; Definitions of Design Thinking, Principles and elements of Design Thinking, Human centric approach.

**UNIT 2:** Design Thinking Process – Stage 1

Understanding the business hypothesis, customer perspective, inspiration, visualization through storyboarding etc.

**UNIT 3:** Design Thinking Process – Stage 2, 3

Defining the problem, Data Collection, Observation techniques, gaining insights, Ideation, concept development.

**UNIT 4:** Design Thinking Process – Stage 4, 5

Experimentation, prototyping principles, Prototyping, Testing, Assumptions Identification.

**UNIT 5:** Design Thinking for Innovation

Design Thinking in organizations, how to diffuse DT into work culture, Using DT to innovate in business, Disruptive innovation.

**Total:** 45 Hours

### Reference Books


#### 21GD02 Industrial Management

**3003**

**9 Hours**

**UNIT 1:** Purpose, Policy, Procedures

Sarasohn framework – Organization purpose, creating a purpose statement; Policies: types of policies-administrative & Management, principles of policies, components of a policy – procedures – creating a policy policy vs strategy.

**UNIT 2:** Organization Zones, Forms and Departments

Zones of organization – function, authority, responsibility and accountability; Different forms of an organization – Line, Functional, Line and staff – line to staff continuum – advantages and disadvantages of different forms of organizations; Departments of an organization – functions and responsibilities – organization chart; Construction of an organization – principles, span of control decision, manpower estimation, control specification.

**UNIT 3:** Organizational Control Basics

9 Hours
Need for organizational control – Man control vs fact control; Prerequisites of control, phases of control, application of control; Production control, personnel control, quality control

UNIT 4: Controlling Cash Flows
Four bucket cash flow framework – creating 4 bucket cash flow from raw cash flows and balance sheets – judging cash flow position of a firm; Cash flow control framework – what to control; Stock control, Expense control, debtor control; CRE analysis of expenses

UNIT 5: Building for Future
Operations – Four principles, decisions to make; Building for the future – Programmed management; Keys for success – leadership, teamwork, communication

Total: 45 Hours

Reference Books

21GD03 NEW PRODUCT DEVELOPMENT

UNIT 1: Introduction, Development Process and Opportunity Identification
New product development - characteristics of a successful product, design job, duration and cost of new product development, challenges of new product development; Product development process and organization – concept development – adapting generic product development process – product development process flows - product development organization; Identifying opportunities – six steps of identification; Management commitment – Review process: Status review, near end review

UNIT 2: Product Planning, Need Identification, Product Specification

UNIT 3: Concept Generation, Selection and Testing
Concept generation – problem clarification – external search – internal search – systematic exploration; Concept selection – concept screening, six steps – concept scoring, six steps; Concept testing – seven steps

UNIT 4: Product Architecture and Design for Industry and Environment
Design for environment – Meaning, need, – DFE process

UNIT 5: Design for Manufacturing & Supply Chain, Prototyping and Robustness
Design for manufacturing and supply chain – Meaning, need, requirements – seven steps; Prototyping – meaning, need, principles, technologies, planning; Robust Design – Meaning, need, seven step robustness process; Patents and intellectual property – meaning, need 7 step process

Total: 45 Hours

Reference Books

21GD04 OPERATIONS MODELLING AND SIMULATION

UNIT 1: Process and Simulation
Business Process - Constituents of a process- Basic tools for process design- Introduction to Simulation- Steps in a Simulation Study - Scope of simulation in operations management.

UNIT 2: Monte-Carlo Simulation Technique

UNIT 3: Application of Probability Distribution In Simulation

Total: 45 Hours

Reference Books

Histogram-Uniform, Normal and Exponential distribution modelling: Test of Normality – Goodness of fit – Kolmogorov Smirnov test -Supply chain- Outbound and Inbound logistics - Spreadsheet solutions

UNIT 4: Simulation of Inventory Management Problems 9 Hours
Periodic Review model-Continuous review model- Base stock policy – Software applications.

UNIT 5: Assessing the Alternative Models 9 Hours
Manufacturing process strategies-Waiting line (QUEUING) model strategies- Software application - Statistical hypothesis techniques - Analysis of Variance Technique – Optimization within simulation

Total: 45 Hours

Reference Books

21GD05 PROJECT MANAGEMENT 3 0 0 3

UNIT 1 : Project Management Framework 9 Hours
Project Management - Program Management - Portfolio Management -Organizational Structures - Project Life Cycle

UNIT 2 : Integration Management 9 Hours
Charter - PM Plan - Change Control - Scope Management - Collect Requirements Project Scope – WBS - Validate and Control Scope

UNIT 3 : Estimating Time and Cost 9 Hours

UNIT 4 : Manage Quality, Human Resource and Communication 9 Hours

UNIT 5 : Manage Risk, Procurement and Stakeholders 9 Hours
Risk Management- Identification of Risk, Quantitative and Qualitative Risk Analysis - Risk Response Procurement Management – Plan Conduct, Control and Close- Managing Stake Holders Expectations

Total: 45 Hours

Reference Books

21GD06 SUPPLY CHAIN MANAGEMENT 3 0 0 3

UNIT 1: Introduction and Strategic View to Supply Chains 9 hours
Evolution of supply chain-Concepts in supply chain – Importance of supply chain – Enablers of supply chain performance – Supply chain performance in India; Customer service vs cost tradeoffs, SCM performance measures: SCOR model, financial data based measures: Supply chain length, supply chain inefficiency, supply chain working capital productivity

UNIT 2: Supply Chain Configuration 9 hours
Make vs buy decision – Functional vs innovative product – Efficient vs responsive supply chain; Two approaches to outsourcing – Focal firm vs hollow firm; Market vs hierarchy, sourcing strategy

UNIT 3: Managing Material Flows in Supply Chain 9 hours
Inventory Management – Types of inventory, inventory costs, managing different kinds of stock; Transportation – Drivers of decision, modes of transport, strategies of distribution; Network Design – Network optimization, restructuring

UNIT 4: Managing Information Flows in a Supply Chain 9 hours
Demand forecasting – role of forecasting, forecasting methods, forecasting errors, bull whip effect; Information technology – information
requirement, four kinds of functions of IT, impact of information on inventory

UNIT 5: Supply Chain Innovations
Supply chain integration – internal and external, impact, enablers; Supply chain restructuring – process restructuring, flow restructuring, inventory placement restructuring; Agile supply chains – high demand uncertainty, five disruptions, dual forecasting, disruption handling; Pricing and revenue management – multiple customer segment pricing, service level determination, limited capacity situations, pricing under capacity constraints

Total: 45 Hours

Reference Books

21GD07 TECHNOLOGY MANAGEMENT

UNIT 1: Technology and its Importance in Business
Definition – Features – Importance – Benefits – Achieving competitive advantage through technology – Types of technologies – Technology portfolio – Technology life cycle – Technology as an investment

UNIT 2: Management of Technology
Overview - Objectives of MOT - Strategic Management of Technology (SMOT) - Exploitation of Technology - Principles of MOT - The role of R&D in an organization - New product development process

UNIT 3: Technology Forecasting
Methods of forecasting technology - Technology obsolescence - Technology discontinuity - Technology audit - Technology scouting

UNIT 4: Absorption and Diffusion of Technology

UNIT 5: Organizational Structure, Organizational Learning and Leadership
Human resource for managing technology - The importance of organizational structure - The structure of an innovative organization - The role of a leader in an innovative organization - Risks and uncertainties associated with technology

Total: 45 Hours

Reference Books

21GD08 THEORY OF CONSTRAINTS

UNIT 1: Thinking TOC Way
Theory of constraints – Philosophies-Goal of an organization-Appreciation of variability and dependency, TOC mindset-Pillars -Thinking process-Logically and clearly-Six layers of resistance to change- Goal tree- Strategic tree-Current Reality Tree, Evaporating cloud, Future Reality Tree-Prerequisite trees - Mafia marketing offers

UNIT 2: Throughput Accounting
Weighing the decision making by money - TOC Measurements on Productivity-Throughput, Operating Expenses, Inventory – Problems on identification of the same from the financial transactions-Difference between TA -Cost accounting-Lean accounting-Cost world vs throughput world Decision making based on exposed capacity. Throughput-margin per unit –T per time unit in factory hours.

UNIT 3: TOC Production
Five focusing steps- Type of Constraints. Identifying the physical constraint. Production planning – Drum buffer rope (DBR) method. Drum buffer and shipping buffer-TOC classification of manufacturing plants.

UNIT 4: TOC Supply Chain Management
Replenishment policy – Addressing the uncertainty -Dynamic buffer management - Aggregation -Responsive supply chain

Total: 45 Hours
UNIT 5: TOC Project Management
Assumptions on Project management – Critical chain project management – Planning and Execution- Buffers – Fever chart - Throughput Dollar days and Investment Dollar days

Reference Books

Total: 45 Hours

21GD09 TOTAL PRODUCTIVE MAINTENANCE AND LEAN MANAGEMENT 3 0 0 3

UNIT 1 : Lean Introduction
Introduction – Background - Lean Thinking - Rules of Gemba, 3M - Seven Wastes - VA and NVA - Principles of Flow - Learning to See

UNIT 2 : Lean Management Core Concepts
5S Implementation Procedure - Layout Modification - Value Stream Mapping - Video Analysis

UNIT 3 : Lean Tools and Methodologies

UNIT 4 : Total Productive Maintenance
Introduction to TPM Concept - Objectives and Functions - Developing the TPM Implementation Plan - Pillars of TPM - TPM organization

UNIT 5 : Scientific Problem Solving

Total: 45 Hours

Reference Books

21GD10 TOTAL QUALITY MANAGEMENT 3 0 0 3

UNIT 1 : Introduction to Quality Management
Quality Definition - Quality Gurus and their Principles - Deming, Juran and Crosby - Total Quality Management - Importance of Quality Efforts - Quality Maturity - Service Quality

UNIT 2 : Quality Planning

UNIT 3 : Quality Control Tools-Design
Quality Function Deployment - Failure Mode Effect Analysis - Design for Six Sigma

UNIT 4 : Quality Control Tools, Process and Acceptance Sampling
7 Tools of Quality Control - 7 Quality Management Tools - Acceptance Sampling for Variables and Attributes

UNIT 5 : Quality Improvement Tools

Total: 45 Hours
21GE01 E-BUSINESS MODELS

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<thead>
<tr>
<th>UNIT 1: Introduction to E-Business Models</th>
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<th>UNIT 2: E-Commerce Infrastructure</th>
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<tr>
<td>Internet Environment for E-Commerce - Providers and Vendors of E-Business Software - E-Business Enabling Technologies - Intranet and Extranet for E-Commerce - Identification and Tracking Tools for E-Commerce - Overview of Internet Bandwidth and Technology Issues - Electronic Data Interchange (EDI) to E-Commerce - EDI - UN/EDIFACT Standard</td>
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<th>UNIT 3: Payment and Security</th>
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<th>UNIT 4: Legal Issues</th>
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<th>UNIT 5: Retailing and Supply Chain</th>
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<td>Online Retail Industry Dynamics - Online Mercantile Models from Customer Perspective - Management Challenges in Online Retailing - Online Publishing Approach from Customer Perspective - Supply Chain Management Fundamentals - Intranets and Supply Chain Management - Managing Retail Supply Chains - Supply Chain Application Software</td>
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Reference Books

21GE02 INFORMATION SECURITY MANAGEMENT

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<thead>
<tr>
<th>UNIT 1: Network Security</th>
<th>9 Hours</th>
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<tr>
<td>Telecommunications and Network Security – Securing the Grid – Attacks in Mobile Environments</td>
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<th>UNIT 2: Security Governance</th>
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<th>UNIT 3: Security in Software Applications</th>
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<th>UNIT 4: Cryptography</th>
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<th>UNIT 5: Data Storage Security</th>
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Reference Books

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Total: 45 Hours
21GE03 MATERIALS MANAGEMENT

UNIT 1: Introduction

UNIT 2: SD Prerequisites
Introduction to Sales and Distribution - Evolution – Importance – Score and Objectives – Interface with other functions necessities – Organizational Structure – Customer – Material – Condition Master – Output

UNIT 3: Order to Cash

UNIT 4: MM Prerequisites

UNIT 5: PurchasetoPay

Total: 45 Hours

Reference Books

21GE04 PRODUCTION PLANNING

UNIT 1: Introduction

UNIT 2: PP Prerequisites

UNIT 3: PP Process

UNIT 4: Manufacturing Execution Process

UNIT 5: Warehouse Management

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Total: 45 Hours

Reference Books

21GE05 ARTIFICIAL INTELLIGENCE AND INTERNET OF THINGS 3 0 0 3

UNIT 1 : Introduction 9 Hours

UNIT 2 : Components of Artificial Intelligence 9 Hours
Improving Operational Effectiveness and Strategic Innovation using Artificial Intelligence - Introduction to Block Chain - Internet of Things - Quantum Computing

UNIT 3 : Developing Artificial Intelligence Models 9 Hours
Building an AI Powered Business - Data Driven Decision Making

UNIT 4 : Applications of Artificial Intelligence in Business 9 Hours
Application of Artificial Intelligence in Marketing, Sales and Customer Service -Data to Scores - Chat Bots - Call Centre Rep Automation - Workflow Automation – Ad Content Prediction

UNIT 5 : Implementing Artificial Intelligence 9 Hours
Concept to Implementation - Implementation of Artificial Intelligence Technology – AI platforms - Data Eco System - Building Expert Teams - Algorithm – Data Feedback System

Total: 45 Hours

Reference Books

21GE06 DATA VISUALIZATION 3 0 0 3

UNIT 1: Data Visualization – A primer of Business Intelligence 8 Hours
Business Intelligence - Data Visualization Evolution and Characteristics – Importance of Data Visualization –Data Visualization Process - Data Visualization Tools and Software - Data Visualization Techniques – Best Practices in Data Visualization

UNIT 2: Data visualization Using Tableau – Basics 9 Hours
Introduction to Tableau – Tableau interface & Architecture – Data connections & Data Sources – Preparation of Data – Exploring and analyzingdata – Creating basic charts – Apply analytics to a worksheet – Creating Groups and Hierarchies - Mapping -Sharing Insights

UNIT 3: Data visualization Using Tableau – Advanced 9 Hours
Advanced calculations - Parameters – Special Charts -Creation of Dashboards – Dashboard Actions -Story Boards Preparation - Sharing the work – Profile creation in Tableau Public

UNIT 4: Reports & Dashboards using Power BI 10 Hours

UNIT 5: Visualizing through R , Python &Qlikview 9 Hours
Grammar of Graphics – GGplot and visualizations using R – Advanced visualizations using matplotlib, seaborn and pyplot – Qlikview overview
Reference Books

21GE07 MACHINE LEARNING  

UNIT 1: Introduction  
9 Hours

UNIT 2: Supervised Machine Learning Techniques  
Conjoint Analysis – Full/fractional factorial design, choice cards, attribute Importance. Linear Discriminant Analysis - Fisher’s method, Mahalanobis method, Standardised coefficients, Unstandardised coefficients, Structured coefficients. Naïve Bayes – Bayes theorem, conditional probability, building naive bayes classifier  
9 Hours

UNIT 3: Advanced Supervised Machine Learning Techniques  
Random Forest – Out of bag error rate, variable importance, tuning hyperparameters. SVM – hyperplanes and support vectors, SVM model building, Ensemble Methods – bagging, boosting, adaboost, gradient boosting, extreme gradient boosting, bias variance trade off, Synthetic minority oversampling technique.  
9 Hours

UNIT 4: Artificial Neural Networks  
9 Hours

UNIT 5: Time Series Analysis  
9 Hours

Total: 45 Hours

Reference Books

21GE08 PRESCRIPTIVE ANALYTICS  

UNIT 1: Lineage of Prescriptive Analytics  
9 Hours

UNIT 2: Operation and Supply Chain Analytics  
Route profitability analysis and optimization – Fleet management – Network planning — Network and capacity optimization – Capacity and pricing analysis - Monte carlo Simulation  
9 Hours

UNIT 3: Exact Optimization  
Linear programming - Integer programming – Dynamic programming – Constraint programming - Decision Analysis  
9 Hours

UNIT 4: Heuristic-Meta Heuristics Optimization  
Heuristic - Greedy algorithm for Travelling salesman problem; Meta Heuristic-Local search heuristic- Simulated annealing - Population-based metaheuristics-Evolutionary computations – Genetic algorithm  
9 Hours

UNIT 5: Holistic Optimization  
9 Hours

Total: 45 Hours
Multiple criteria decision making - Analytic Hierarchy process - Approximation Methods - Scalar Method – Aggregation – Weighted matrix eConstraint - Multi objective optimization— Goal programming - Pareto efficiency

Total: 45 Hours

Reference Books

21GE09 PYTHON PROGRAMMING FOR ANALYTICS

UNIT 1: Introduction to Python
9 Hours

UNIT 2: Python For Data Analysis
9 Hours
Python Libraries – Numpy – Vector and Matrix indexing, slicing, shape, reshape, joint split, sort filter, copy vs view – Random numbers; Pandas Library – Creating Dataframe, Slicing and Dicing the Data Frame, .loc and iloc, Adding Columns to Data Frame, Dropping Rows and Columns, Sorting Dataframe, Grouping the Data, Data cleaning and pre-processing

UNIT 3: Data Visualization using Python
9 Hours
Matplotlib Library – Histogram, Scatter Plot, Pie Chart, Area Chart, Meshgrid, Quiver Plot, Contour Plot; Seaborn Library - Count Plot, Bar Plot, Point Plot, Violin Plot, Swarm Plot, Rug Plot, Cat plot; Introduction to Plotly – Animated plots

UNIT 4: Model Building using Python
9 Hours
Statistical libraries for model building – Random forest, Support vector machines, Ensemble methods

UNIT 5: TensorFlow
9 Hours

Total: 45 Hours

Reference Books