NIST UNIVERSITY

PROPOSED COURSE STRUCTURE AND SYLLABUS

FOR

THIRD SEMESTER

MASTER OF BUSINESS ADMINISTRATION (MBA)

AND

MASTER OF BUSINESS ADMINISTRATION IN BUSINESS ANALYTICS (MBA-BA)

PROGRAMME

(From 2024-2025 onwards)

www.nist.edu

DEPARTMENT OF MANAGEMENT STUDIES

(School of Management Studies)

Institute Park, Pallur Hills Berhampur-761008. Ganjam, Odisha

Second - Year Course Structure (3rd Semester, MBA)							
S. No.	**Course Category**	**Course Code**	**Course Title**	**L**	**T**	**P**	**Credits**
1	DSE	xxx-xxx*	Elective-1	4	0	0	4
2	DSE	xxx-xxx*	Elective-1	4	0	0	4
3	DSE	xxx-xxx*	Elective-1	4	0	0	4
4	DSE	xxx-xxx*	Elective-2	4	0	0	4
5	DSE	xxx-xxx*	Elective-2	4	0	0	4
6	DSE	xxx-xxx*	Elective-2	4	0	0	4
8	PR	MGT-615	Summer Internship Project	0	0	4	2
7	PR	MGT-616	Technical Seminar	0	0	4	2
Total Credits							**28**

* *A student can choose any two elective groups from the following electives group as elective 1 and elective 2.*

Sl. No	**Elective groups**	**Subject Code**	**Name of the Subject**
1	Finance	MGT 600	Security Analysis and Portfolio Management
2		MGT 601	Financial Derivatives
3		MGT 602	Project Appraisal
1	Marketing	MGT 603	Consumer Behaviour
2		MGT 604	Strategic Digital and Social Media Marketing
3		MGT 605	Branding and Integrated Marketing Communication
1	HR	MGT 606	Industrial Relations
2		MGT 607	Compensation Management
3		MGT 608	Human Resource Management Analytics
1	Operations	MGT 609	Supply Chain and Logistics Management
2		MGT 610	Sourcing Management

3		MGT 611	Supply Chain Analytics
1	Business Analytics	MGT 612	Financial Analytics
2		MGT 613	Marketing Analytics
3		MGT 614	Human Resource Management Analytics

**The student will continue with the same electives group in the fourth semester.*

Second - Year Course Structure (3rd Semester, MBA-BA)							
S. No.	**Course Category**	**Course Code**	**Course Title**	**L**	**P**	**T**	**Credits**
1	DSE	MGTBA 600	Financial Analytics	4	0	0	4
2	DSE	MGTBA 601	Marketing Analytics	4	0	0	4
3	DSE	MGTBA 602	Human Resource Management Analytics	4	0	0	4
4	DSE	MGTBA603	Business Statistics and Analytical Foundations	4	0	0	4
5	DSE	MGTBA604	Data Analysis Life Cycle	4	0	0	4
6	DSE	MGTBA605	Advanced Business Analytics Lab-1	0	8	0	4
7	PR	MGTBA 606	Technical Seminar	0	4	0	2
7	PR	MGTBA606	Summer Internship Project	0	4	0	2
Total Credits							**28**

Department of Management Studies
School of Management and Liberal Arts
N I S T U N I V E R S I T Y
Institute Park, Pallur Hills, Berhampur-761008

www.nist.edu

THIRD SEMESTER

(MBA)

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT 600	SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT	4	0	0	4

Course Objective

Enables student to understand the nuances of stock market operations understand the techniques involved in deciding upon purchase or sale of securities.

Course Outcomes

1. Understand the basic concepts of investment and portfolio
2. Analyse the individual security and a group of securities.
3. Construct and manage a portfolio.
4. Evaluate and revise the portfolios.

Module 1: Introduction to Stock Market Investment *(08 Hours)*

Meaning, Features and objectives, Alternative forms of investment, Valuation of Shares, Concepts of risk and return, how risk is measured in terms of standard deviation and variance, the relationship between risk and return, Evolution of portfolio management, phases of portfolio management

Module 2: Equity Analysis *(10 Hours)*

Fundamental Analysis: Economic, Industry and Company Analysis, Technical Analysis: Dow Theory, Elliots Wave Theory, Charting tools, Volume and price trends, technical indicators, Efficient Market Hypothesis: Weak Form, Semi-strong Form and Strong Form

Module 3: Portfolio Management (12 Hours)

Risk & Return on investment measuring risk and return on 2 Asset on 'n' asset portfolio, Markowitz Efficient function. Portfolio Selection: feasible set portfolios, efficient set, utility theory, selection of optional portfolio using utility concept, Markowitz portfolio optimization, efficient frontier with risk free lending and borrowing capital, CAPM, pricing of securities

with CAPM, Arbitrage pricing theory. Sharpe's Single Index model, Computation of Risk and Return on a portfolio, Interpretation of portfolio, Alpha, Beta, Sharpe portfolio optimization.

Module 4: Portfolio Revision & Evaluation (10 Hours)

Need and Constraints, Revision Strategies, Formula Plans: Constant Dollar Value Plan– Constant Ratio Plan - Dollar Cost Averaging etc., Portfolio Performance Evaluation: Measure of Return, Risk Adjusted Measure of Performance Evaluation.

Text Book:

1. Kevin (2006)Security Analysis & Portfolio Management, PHI

Reference Books:

1. V.K.Bhalla (2019)Security Analysis & Portfolio Management,19th edition , S.Chand
2. Singh(2010) Investment Management(SAPM),10th edition , Himalaya Publishing House
3. Sasidharan, Mathews(2010) SAPM, 10th edition, Tata McGraw Hill

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT 601	FINANCIAL DERIVATIVES	4	0	0	4

Course Objective

To introduce the students to understand the Nitty-gritty involved in derivatives and understand the basic operational mechanisms in derivatives market

Course Outcomes

1. To understand the functions of derivative market and its development.
2. To make the students understand about the future market and its pricing.
3. To make the students understand about the option market and it's pricing
4. To introduce the swap contracts and emerging derivative products.

Module 1: Introduction to Financial Derivatives ***(10 Hours)***

Meaning & types of Derivative Instruments, Forward, future, Option & swaps, Spot v/s Future Market, Growth of Derivative Markets in India-History & Background, ETM & OTC Markets, Types of Traders- Hedger, Arbitrageur and Speculatior, Standardization of Derivative Contracts and other basic concepts. Factors contributing to the growth of Derivatives, Forward contract, Features of Forward Contract, Classification of Forward Contracts.

Module 2: Future Market ***(10 Hours)***

Introduction, Financial Futures contracts, Types of Financial Futures, Basic hedging practices, continuous compounding, Pricing of forward and Future contracts: cost of carry model, margin requirement for futures, Open interest positions, convenience yield, stock futures, use and application of stock index futures, arbitrage with stock futures, Beta and the optimal hedge ratio, Currency Futures Market.

Module 3: Options Market (12 Hours)

Types of Options, option moneyness, Option Trading, Margins, Valuation of Options, Put-call parity relationship, Factors affecting option pricing Binomial Option Pricing Model, Black-Scholes Model for Call Options, - put-call parity, Index Options, Option Markets-Exchange Traded Options, over the Counter Options.

Module 4: Swap Market and Risk Management (8 Hours)

SWAP: Introduction, concept, Nature, Evolution, Features, Types of Swaps: plain vanilla swaps, interest rate swaps, currency swaps.

Text Book:

1. Gupta (2005) Financial Derivatives-Theory, concepts and problems, PHI

Reference Books:

1. Srivastava (2014) Derivatives and Risk Management,2nd edition Oxford
2. Hull (2018) Options, Futures and other Derivatives, 10th edition, Pearson
3. Verma J.R (2008), Derivatives and Risk Management, TMH

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT 602	PROJECT APPRAISAL	4	0	0	4

Course Objective

To explain identification of a project, feasibility analysis including market, technical and financial appraisal of a project

Course Outcomes

1. Understand the basic concept of project management and project screening.
2. Make market and technical analysis of the project.
3. Manage sources of fund and make financial projections.
4. Estimate cash flow and make financial appraisal of the project.

Module 1:

Introduction: Concept of Project Management, Project and Capital Budgeting, Objectives and Phases of Capital Budgeting, Resource Allocation, Generation and Screening of Project Idea, Environmental Appraisal and Clearance, Forms of Project Organization.

Module 2:

Market and Technical Analysis of Project: Market and Demand Analysis for New Ventures, Information Required for Market and Demand Analysis, Sources of Information, Market Survey, Demand Forecasting, Uncertainties in Demand Forecasting, Technical Analysis-Material and Inputs, Production Technology and Product-Mix, Plant Capacity, Location Site, Project Charts and Layouts.

Module 3:

Financial Estimates and Projections: Cost of Project, Means of Financing, Cost of Production, Working Capital Requirement, Planning and Capital Structure of a New Project, Financial Projections-Projected Balance Sheet, Projected Sources and Uses of Funds Statement, Projected Cash Flow Statement and Projected Income Statement - Estimation of Sales and Costs.

Module 4:

Financial Appraisal of Projects: Components of Cash Flow, Basic Principles of Cash Flow Estimation, Viewing a Project from Different Points of View, Appraisal Criteria - Pay Back Period, Accounting Rate of Return, NPV, IRR and Benefit-Cost Ratio, Rationale for Social Cost- Benefit Analysis, Unido Approach, Little mirlee approach, Project Implementation.

Text Book:

1. Chandra, P (2015) Project, 8th edition, Tata McGraw Hill.

Readings:

1. Bryce, M.C.: Industrial Development, McGraw Hill (Int. ED.) New York.
2. Chandra, Prasanna : Project Preparation, Appraisal and implementation, Tata McGraw Hill, Delhi.
3. IDBI : Manual of Industrial Project Analysis in Developing Countries.
4. O.E.C.D.:(i)Manual for Preparation of Industrial Feasibility Studies.(ii)Guide to Practical Project Appraisal.
5. Pitale, R.L. : Project Appraisal Techniques, Oxford and IBH.
6. Planning Commission : Manual for Preparation of Feasibility Report.
7. Timothy, D.R. and W.R. Sewell : Project Appraisal and Review, Macmillan, India.
8. Chaudhary, S. : Project Management, Tata McGraw Hill, New Delhi.
2. Little I.M.D. and Mirrless J.A.: Project Appraisal and Planning for Developing ountries, Heinemann Education Books, London.

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT 603	CONSUMER BEHAIOUR	4	0	0	4

Course Objective

By the end of the course, students are expected to: Demonstrate proficiency and a comprehensive understanding of how various academic disciplines contribute to the study of buyer behaviour from a holistic perspective. Be familiar with recent advances in consumer research, particularly in understanding buyer motivation and behaviour across all stages — pre-purchase, purchase, and post-purchase. Understand the influence of social and cultural variables on consumption decisions. Be equipped with analytical frameworks to interpret consumer behaviour effectively and apply these insights in designing marketing strategies and enhancing the impact of marketing programs.

Course Outcomes

1. To analyse how consumers make purchasing decisions (what, why, when, where, and how they buy).
2. To anticipate current and future consumer needs and preferences.
3. To identify and understand consumers individual determinant which ultimately help businesses align their offerings with consumer expectations.
4. Helps in identifying the factors that influence buying choices (psychological, social, cultural, etc.).

Module 1: Introduction *(10 Hours)*

What Is Consumer Behavior? Why Study Consumer Behavior? Evolution of Consumer Behavior? Challenges for the Future. The role played by Digital media and Internet. Segmentation, Psychographics & VALS; Diffusion of Innovations.

Module 2: **Consumer Decision Process and Models of Consumer Behaviour*(10 Hours)***

The Consumer Decision Process, Factors affecting the Decision Process, Models of Consumer Behaviour; Traditional models: Economic model, learning model, phychoanalytic

model, Sociological model, Contemporary Models: Howard Seth Model, Angle Blackwell Kollat (Multimediation Model), Nicosia Model.

Module 3: Individual Determinants *(10 Hours)*

Individual Determinants of Behaviour: Personality, perception, attitude, learning, Motivation, Group influence on consumer behavior: Social class, Social groups, and Opinion leaders.

Module 4: External factors influencing Consumer Behaviour *(10 Hours)*

Culture and its impact on Consumer behaviour, Relevance of culture in making decisions, Family: Role & Structure, Family Life Cycle, Purchasing decisions, changing role of families.

Text Book:

1. Blackwell, Miniard, Engel & Rahman (2017), Consumer behaviour,10th edition, Cengage

Reference Books:

1. Loudon & Bitta (1992) Consumer Behavior concepts and Applications, McGraw Hill.
2. Mukherjee Srabani (2011) Consumer Behaviour, Cengage.

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT 604	DIGITAL AND SOCIAL MEDIA MARKETING	4	0	0	4

Course Objective:

This course is designed to equip students with advanced skills in digital and social media marketing, integrating contemporary tools, platforms, and analytical practices to prepare them for leadership roles in marketing and brand management.

Course Outcomes:

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

1. Design integrated digital marketing campaigns using paid, owned, and earned media.
2. Utilize data analytics and AI tools for performance measurement, segmentation, targeting, and personalization.
3. Create social media strategies tailored to specific platforms and consumer behavior insights.
4. Apply SEO, SEM, influencer marketing, and content strategies effectively across multiple digital touchpoints.

Module 1: Introduction to Modern Digital Marketing *(10 Hours)*

Evolution from Traditional to Digital and Post-Digital Marketing; Core Concepts: Customer Journey, Funnel, Engagement Loops; Role of AI and Automation in Marketing; Omnichannel vs Multichannel Marketing; Digital Marketing Ecosystem: AdTech, MarTech, and Commerce Tech; Frameworks: PESO, RACE; SOSTAC; Current Trends: Voice Search, Chatbots, Influencer Marketing.

Module 2: Search Marketing, Content, and SEO/SEM *(10 Hours)*

Search Engine Optimization (SEO): On-page, Off-page, and Technical SEO; Search Engine Marketing (SEM): Paid Search, Google Ads, Bidding Strategies; Content Marketing:

Strategy, Distribution, Content Calendar, CMS; Introduction to Generative AI Tools; Local SEO and Google Business Optimization.

Module 3: Social Media Strategy and Platform Marketing *(10 Hours)*

Platform Deep Dive: Meta (Facebook & Instagram), LinkedIn, X (Twitter), YouTube, Snapchat; Social Listening and Sentiment Analysis; Influencer Marketing Strategy and Tools; Building a Brand Voice and Content Style Guide; UGC and Community Management

Module 4: Performance Marketing, Analytics & Future Trends *(10 Hours)*

Email Marketing, Mobile App Marketing, and SMS Campaigns; Performance Marketing: Programmatic, Affiliate, and Retargeting; Web & Campaign Analytics: Google Analytics 4 (GA4), Tag Manager; Customer Data Platforms, CRM Integration; Privacy, Consent, and Digital Compliance; KPIs and ROI Measurement in social media; E-Commerce Business Model.

Text Books:

1. Chaffey, Dave & Ellis-Chadwick, Fiona (2022), *Digital Marketing* (8th Edition), Pearson
2. Kotler, Philip; Kartajaya, Hermawan; Setiawan, Iwan (2021), *Marketing 5.0: Technology for Humanity, Wiley*
3. Seema Gupta (2023), *Digital Marketing* (3rd Edition), McGraw Hill Education.

Reference Books:

1. Kotler, Philip; Kartajaya, Hermawan; Setiawan, Iwan (2021), *Marketing 5.0: Technology for Humanity*, Wiley.
2. Barker, Melissa S.; Barker, Donald I.; Zahay, Debra (2020), *Social Media Marketing: A Strategic Approach* (3rd Edition), Cengage.
3. Ryan Damian (2020), *Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation*, Kogan Page.

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT 605	BRANDING AND INTEGRATED MARKETING COMMUNICATION	4	0	0	4

Course Objective:

The purpose of this course is to help students appreciate the significance of brands in today's commercial landscape. In recent years, brands have risen to the forefront of marketing, with many claiming they are a company's most asset. It is the aim of this course to teach students the processes involved in developing and maintaining brands. To equip practitioners with the theoretical frameworks, illustrative models, and other analytical resources necessary to make sound branding decisions. And to expose learners to the fundamental ideas and methods behind creating and constructing an efficient Integrated Marketing Communication plan.

Course Outcomes:

1. To gain an understanding of why and how brand strategy may help you succeed in business
2. Learning about the major challenges of brand management and development
3. Helping students develop the know-how necessary to plan and carry out effective brand management
4. It teaches students about communication tools and their usefulness, encouraging their creativity in developing a successful marketing communications strategy.

Module 1: Branding concepts *(6 hours)*

Brands & Brand Management: Brand Elements – Core Brand Values and Brand Mantra – Brand Value Chain – Brand Value Proposition – Functional, Emotional and Self Expressive Benefits – Strategic Brand, Brand and marketing success: corporate and country perspective. Iconic brands – Global brands.

Module 2: Brand Equity, Positioning, Brand Identity & Personality *(10 Hours)*

Brand equity- Keller and Aaker Framework, The Brand Equity Pyramid – Brand Resonance; Brand Positioning – Identifying, choosing and communicating Points of Parity and Points of Difference – Brand Associations, Brand Repositioning; Brand Identity – Kapferer's Brand

Identity Prism – Elements of Brand Identity – Co-branding and Ingredient branding; Brand Personality – Brand Personality Dimensions and Traits – Drivers of brand personality

Module 3: Branding strategy and Brand Valuation ***(12 hours)***

Brand strategies- the trade off between efficiency and effectiveness; Brand architecture and portfolio; Product life cycle, brand life cycle- challenges and strategies, Managing Brands over time: Brand Revitalization - Brand Extension strategies – Product Category and Line Extension, Brand Valuation – Methods: Cost, market and Income approach, Brand Valuation Models - – Interbrand, Y&R's Brand Asset Valuator, Millward Brown's Brand Dynamics approach and Brandz.

Module 4: Integrated Marketing Communication (IMC) ***(12 hours)***

Integrated Marketing Communication (IMC): Meaning and role of IMC in the Marketing process, Introduction to IMC tools Advertising, sales promotion, publicity, public relations, and event sponsorship; Communication response hierarchy AIDA model, Hierarchy of effect model, Planning for Marketing Communication (Marcom): Establishing Marcom Objectives and Budgeting for Promotional Programs-Setting communication objectives, Sales as marcom objective, DAGMAR approach for setting ad objectives.

Textbook

1. Strategic Brand Management: Building, Measuring, and Managing Brand Equity, Author(s): Kevin Lane Keller, Ambi M. G. Parameswaran, Isaac Jacob Publisher: Pearson Education, Year: 2015, ISBN: 9789332542204,9789332558939
2. Strategic Integrated Marketing Communication: Theory and Practice, Author(s): Percy, Larry Publisher: Butterworth-Heinemann, Year: 2008 ISBN: 9780750679800, 9780080878294, 0080878296

Reference book

1. Brand positioning : strategies for competitive advantage, Author(s): Subroto Sengupta, Publisher: Tata McGraw-Hill, Year: 2007, ISBN: 9780070581593,0070581592
2. The New Strategic Brand Management: Advanced Insights and Strategic Thinking, Author(s): Jean-Noel Kapferer, Series: New Strategic Brand Management: Creating & Sustaining Brand Equity, Publisher: Kogan Page, Year: 2012, ISBN: 0749465158,9780749465155
3. Advertising: An Integrated Marketing Communication Perspective, Author(s): Belch, George E.; Belch, Michael A.; Kerr, Gayle; Waller, David; Powell, Irene H., Publisher: McGraw-Hill Connect, Year: 2020 ISBN: 1760422991,9781760422998

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT 606	INDUSTRIAL RELATIONS	4	0	0	4

Course Objective:

After studying the subject students will learn about the concept of industrial relation and their importance in today's work environment. The primary aim of this course is to introduce students to the theories, institutions, and practices of industrial relations, including trade unions, and to learn the concepts of industrial disputes and the different mechanisms for settling them. Understand the concept of collective bargaining and emerging trends in the field of collective bargaining.

Course Outcomes:

1. Develop an understanding of industrial relations institutions such as employer associations, trade unions and industrial tribunals; principles of employment law.
2. Learn how to resolve industrial relations and human relations problems and promote the welfare of industrial labour.
3. Design mechanisms to settle down industrial disputes and minimize the level of employee unrest by suggesting positive measures.
4. Learn how to implement different acts and legislations for carrying out different industrial activities.

Module 1: Industrial Relations ***(10 Hours)***

Concept, Approaches to IR, Parties to IR, System Model of IR, Rise of Industrial Workers, Profile of Industrial Workers in India, Problems of Industrial Workers (absenteeism, commitment, Work Ethics), New actors and the emerging dynamic, Competition based on cheap labour.

Module 2:Module-II: Trade Unionism in India ***(10 hours)***

Introduction, Reasons for Joining Trade Unions, Functions of Trade Unions, Types of Trade Unions, Emerging role of trade Unions in India, Trade Union Act 1926.

Module 3: Industrial dispute and resolution ***(10 hours)***

Concept, nature & causes of industrial disputes machinery for solving industrial disputes under Industrial Disputes Act, 1947 at national and state level. Collective Bargaining, process, and stages of bargaining, Grievance Management. Worker's participation in Management in India.

Module 4: Acts and Legislations *(10 Hours)*

Factories Act 1948, Contract Labor Act 1970, Industrial Employment (Standing orders) Act, 1946.

Text Books:

1. Ratnam, Dhal (2017) Industrial relations, 2nd edition, Oxford University Press.
2. Padhi (2012) Labor Laws, 2nd edition, PHI

Reference Books:

1. Sinha, Sinha & Shekhar (2017) Industrial Relations, Trade Unions & Labor Legislation,3rd edition, Pearson.
2. Monappa (2003) Industrial Relations, TMH, New Delhi
3. Mamoria, Gankar (2010) Dynamics of Industrial Relations,2nd edition,HPH

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT 607	COMPENSATION MANAGEMENT	4	0	0	4

Course Objective

Students will understand various dimensions of Compensation Management and different methods of payment with wages and different theories to determine wages. Understand the concept of job evaluation and emerging trends in the field of wage policy. Compensation strategies and emerging trend in expatriate compensation will also be learned. Concept of incentive plans, pre-requisites for designing effective incentive schemes will be discussed in class.

Course Outcomes:

1. Apply the concepts of compensation management in order to smooth function of the organization and to analyze the role of reward in order to create a work environment.
2. Learn to apply the policies for determining of Wages and reward strategies and design a pay plan based on market conditions and competitors' strategies.
3. Utilize the concept of Expatriate compensation, strategies, and design pay band based on emerging trends and mobilize the resources of an organization for optimum result.
4. Designing different types of Incentive plans for motivating employee's work performance and create a competitive environment that can lead to develop the creativity and innovation in the organization.

Module 1: Compensation management ***(10 Hours)***

An Introduction: Compensation Management, Compensation and Non-compensation Dimensions, 3-P Concept in Compensation Management, Compensation as Retention Strategy, Methods of Payment., Aligning compensation with business strategy.

Module 2: Wage and Salary Administration ***(10 Hours)***

Concept, wage structure, wage fixation, wage and salary administration, wage differential, types of wages, Definition of Job Evaluation, Job evaluation process, and Job evaluation methods.

Module 3: Compensation Strategy *(10 Hours)*

Managing reward, Flexible compensation benefit plans, Internal and External Factors Affecting Compensation Strategies, Expatriate Compensation and its Objectives, Elements of Expatriate's Compensation Package, Employee stock options plans.

Module 4: Incentive Schemes *(10 Hours)*

Concept, features, types of Incentive plans, Prerequisites of Effective Incentive Schemes, Merits and Demerits of Incentives, performance-based pay system, Executives' compensation plans, and packages**.**

Text Book:

1. Strategic Compensation Management- Gary Dessler – Pearson

Reference Books:

1. Compensation and reward management, B.D.Singh: Excel Books.

2. Compensation – Milkvich & Newman: - TMH

3. Compensation Management, Dr. Kanchan Bhatia,-Himalaya Publishing House

4. Compensation Management, Deepak Bhattacharya:-Oxford University Press.

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT 608	HUMAN RESOURCE MANAGEMENT ANALYTICS	4	0	0	4

Course Objective:

This course aims to develop analytical competencies in Human Resource Management by integrating data-driven decision-making, HR metrics, and emerging technologies. It equips students with the skills to interpret and apply HR data using analytical tools and predictive models, ensuring ethical governance. The course prepares students to align human capital strategies with organizational objectives through evidence-based, tech-enabled HR practices.

Course Outcomes:

Upon successful completion of the course, students will be able to:

1. Explain the foundational concepts, frameworks, and strategic significance of HR analytics and apply ethical principles and data governance practices in analytics implementation. *(Module 1: Understand, Apply)*
2. Develop HR metrics and dashboards using data from various HR systems and interpret trends to support evidence-based decision-making. *(Module 2: Apply, Analyze)*
3. Apply statistical and machine learning techniques for predictive HR analytics, including workforce forecasting, attrition prediction, and talent modeling. *(Module 3: Apply, Analyze)*
4. Evaluate the use of AI, ONA, and other digital technologies in HR, and design responsible analytics solutions aligned with organizational goals and ethical standards. *(Module 4: Evaluate, Create)*

Module 1: Foundations of HR Analytics and Value Frameworks *(10 Hours)*

Introduction to HR analytics: Evolution, scope, and contemporary relevance; Strategic role of analytics in evidence-based HRM; Frameworks: Analytics Process Model (APM), LAMP, and HCM:21; Human capital valuation and its business impact; Types and levels of HR

analytics: Descriptive, Diagnostic, Predictive, Prescriptive; Ethical use of people data, algorithmic bias, and legal compliance (GDPR, DPDP).

Module 2: HR Metrics, Dashboards, and Data Interpretation *(10 Hours)*

HR data sources: HRIS, surveys, ATS, exit interviews, L&D platforms; Designing and applying HR metrics across the employee lifecycle (recruitment, onboarding, training, performance, engagement, retention); KPI development and benchmarking best practices; HR Scorecard vs Balanced Scorecard; Creating impactful HR dashboards; HR analytics tools and software's.

Module 3: Predictive Analytics and Talent Intelligence *(10 Hours)*

Forecasting models for strategic workforce planning; Attrition prediction using statistical and ML techniques (logistic regression, decision trees); L&D analytics: Skill gap mapping, training ROI analysis; Performance modeling and variable pay optimization; DEI analytics using demographic and sentiment data; Internal mobility models.

Module 4: AI, Future Skills, and Ethical Analytics in HR *(10 Hours)*

Applications of AI/ML in HR: Resume parsing, sentiment analysis, chatbot automation; Organizational Network Analysis (ONA) for collaboration mapping; Skill-based talent frameworks and internal gig marketplaces; Calculating and communicating ROI for strategic HR interventions; Responsible AI: Bias detection, fairness, explainability in HR algorithms; HR analytics maturity model and digital transformation trends in the HR tech landscape.

Text Books:

1. Koene, B. A. S., and Colakoglu, S. N. (Eds.). (2024). *HRM and digital transformation: Practice, research and pedagogy*. Springer.
2. Weller, I. (2023). *HR analytics: Understanding the uses and impacts of HR metrics and data.* Routledge.
3. Tambe, P., Cappelli, P., & Yakubovich, V. (2022). *The future of HR: Using analytics to drive business success*. Harvard Business Review Press.
4. Fitz-enz, J., and Mattox, J. R. (2022). *People analytics in the era of Big Data: Changing the way you attract, acquire, develop, and retain talent* (2nd ed.). Wiley.

Reference Books:

1. Minbaeva, D. (2022). *Strategic HR analytics: Measurement, tools, and strategies*. Cambridge University Press.
2. Edwards, M. R., and Edwards, K. (2021). *Predictive HR analytics: Mastering the HR metric* (2nd ed.). Kogan Page.

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT 609	SUPPLY CHAIN AND LOGISTICS MANAGEMENT	4	0	0	4

Course Objective:

To analyze the supply chain scenario and to make the students understand the insights of supply Chain Management Process, and to enhance the understanding of Trade logistics and modes of transportation in supply chain integration and sustainable supply chain strategic skills among the students.

Course Outcomes:

1. Describe the foundational concepts, structure, objectives, and strategies of Supply Chain Management, and explain coordination mechanisms such as Push-Pull strategies and the Bullwhip Effect.
2. Analyze and apply best practices in supply chain implementation, evaluate performance through benchmarking, and explore emerging technologies and trends like 3PL/4PL, RFID, and IT in supply chains.
3. Explain the evolution and integration of trade logistics, and assess transportation decisions including the selection of 3PL providers in both domestic and international logistics contexts.
4. Evaluate the processes and challenges in order processing, packaging, and warehousing, including documentation, material handling, and storage functions in international trade logistics

Module 1: Supply Chain Foundations *(12 Hours)*

Objectives for Supply Chain Management, Supply Chain Management and structure, Supply Chain decisions, Customer and Supplier Interface for Supply Chain Management, importance of Supply Chain Management, Elements & functions and Key issues of Supply chain Management, Strategies of Supply Chain Management, Integrating and Coordinating the Supply Chain: The Push- Pull Mechanism, Bullwhip Effect Integration of Supply Chain Management Components, Creating and managing the Supply Chain, Managing uncertainty in Supply Chain.

Module 2: Supply chain Implementation, Performance Benchmarking and best practices ***(08 Hours)***

Implementing Supply Chain Management, SCOR Model, Supply Chain performance benchmarking, Performance measures for Agile Supply Chains. Tierization of suppliers, Reverse Logistics, Vendor Managed Inventory, Milk Round System, Bar Coding, Trends in the use of 3PL and 4PL providers, Hub and Spoke Concept, Postponement Strategy, Cross Docking, Drop-Shipping, Risk pooling, Trans-Shipment, RFID, Lean Operations Technique, Need and role of IT for Supply Chain.

Module 3: Integrated Logistics and Transportation Management ***(10 Hours)***

Introduction to Trade logistics, Evolution and Development of Trade Logistics: Physical Distribution, Internally Integrated Logistics, Externally Integrated Logistics, International Trade Logistics. Importance of Trade Logistics. Introduction to Integrated Logistics, Choosing a 3PL Provider. Importance of Transportation Decision, Factors affecting the Choice of Transportation

Module 4: Order Processing, Packaging and Warehousing ***(10 Hours)***

Challenges in Information Processing, Logistics Information system, Logistics Operations System, Acknowledgement and Scrutiny of an Export Order, Clarification and Order Confirmation. Need for Packaging in Trade Logistics, Packing Vs Packaging, Packing List Vs Packing Note, Packaging and Transport Hazards, Choice of Packing Material for International Logistics. Concept of Warehousing, Need for Warehousing, Functions of warehousing, Benefits of warehousing, Types of Warehousing, Documents in warehousing.

Text Book:

1. Ram Singh, International Trade Logistics, Oxford Publications.

Reference Books:

1. Sunil Sharma, Supply Chain Management Concepts, Practices and Implementation, Oxford Publication,2015
2. Ajay K Garg , Production and Operations Management , Tata Mc Graw Hill,2012.
3. D.K Agrawal, Textbook of Logistics and Supply Chain Management, Macmillan,2003

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT 610	SOURCING MANAGEMENT	4	0	0	4

Course Objective:

This course aims to provide students with a comprehensive understanding of sourcing and purchasing management in supply chains. It introduces foundational concepts including sourcing activities, purchasing functions, and the roles and responsibilities of purchase managers. The course equips learners with the skills to evaluate supplier efficiency through vendor rating and selection methods, and guides them in making informed make-or-buy decisions. Students will gain insights into pricing strategies and negotiation techniques critical to sourcing effectiveness. Furthermore, the course highlights key legal aspects of procurement, including contract law, GST, and tendering processes, with a special emphasis on public sector purchasing and e-tendering practices.

Course Outcome:

1. Explain the fundamental concepts of sourcing and purchasing, differentiate between sourcing and procurement, and analyze the role and responsibilities of a purchase manager, including the make-or-buy decision process.
2. Evaluate supplier performance using vendor rating and selection methods, and assess factors affecting supplier efficiency including the development and identification of international suppliers.
3. Analyze various pricing strategies and identify the objectives and influencing factors of pricing, along with applying negotiation techniques to sourcing decisions.
4. Interpret the legal framework governing purchasing activities, including relevant Indian laws, and outline the procedures and principles of public procurement and tendering processes including e-tendering.

Module 1: Introduction to sourcing *(8 Hours)*

Introduction to sourcing, sourcing Vs Procurement, sourcing activities, purchasing, purchasing cycle, 8R's of purchasing, characteristics of a purchase manager, Risks to considered by purchasing manager, Make and Buy Decision: An Introduction.

Module 2: Evaluating Suppliers Efficiency *(10 Hours)*

Vendor Rating, Vendor selection, Vendor Development, Need for measuring supplier performance, categories of supplier, supplier evaluation and selection process, vendor rating process, factor affecting the selection of optimal suppliers or vendor rating, supplier evaluation methods/ vendor rating methods, advantage of vendor/ supplier rating, identify and evaluating the international suppliers.

Module 3: Price determination and Negotiation *(10 Hours)*

Pricing: Objective of pricing, factors influencing pricing, types of pricing strategies, Negotiation in sourcing: Meaning of negotiation, types, process, skill for successful negotiation, obstacles to negotiating.

Module 4: Legal aspects of Purchasing Management, Public Purchasing, Tendering *(12 Hours)*

Legal Aspect of purchasing Management: An Introduction, The Indian contract act, 1872, GST, Law of carriage of Goods. Public Purchasing: Procurement process, fundamental principle of public buying. Tendering: Introduction, tendering process, e-tendering.

Reference Books:

1. Fred Sollish, John Semanik, Strategic Global Sourcing Best Practices, John Wiley and Sons Inc., Publications,2011
2. Olivier Bruel, Strategic Sourcing Management: Structural and Operational Decision–making, KoganpagePublications,2017
1. 3.Sathit Parniangtong, Supply Management: Strategic Sourcing, Springer Publications,2016

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT 611	SUPPLY CHAIN ANALYTICS	4	0	0	4

Course Objective:

This course aims to provide students with a deep understanding of the principles and practices of Supply Chain Analytics. It focuses on the application of analytical tools and models to support decision-making in forecasting, inventory management, network design, and demand planning. The course also emphasizes the role of predictive modelling, uncertainty representation, and strategic fit in designing flexible and responsive supply chains in a dynamic business environment.

Course Outcomes:

1. Explain the core concepts of supply chain management and analytics, evaluate supply chain strategies, drivers, and planning approaches, and assess strategic fit for achieving supply chain goals.
2. Apply forecasting methods such as time series and exponential smoothing to supply chain decisions, analyze demand variability and seasonality, and measure forecast accuracy using appropriate error metrics.
3. Analyze inventory management techniques in multi-echelon supply chains and design efficient network models, considering location decisions, global networks, and uncertainty in distribution.
4. Utilize supply chain analytics tools including predictive modeling and decision trees to handle uncertainty, determine optimal product availability, and evaluate future trends and challenges in supply chain management.

Module 1: Understanding and defining Supply Chain Analytics ***(10 Hours)***

Introduction to SCM, Analysis in SCM, Supply Chain Planning, Different views of Supply Chain, Supply Chain Strategy, Supply Chain Driver, Developing Supply Chain Strategy, Strategic fit in Supply Chain.

Module 2: Forecasting for Supply Chain decisions ***(10 Hours)***

Forecasting in Supply Chain, Bull Whip effect and Time Series Analytics, Exponential Smoothing method of Forecasting, Measures of Forecasting Errors, Tracking Signal and Seasonality Models, Forecasting using multiple characteristics in Demand Data and Inventory Management in Supply Chain

Module 3: Inventory Management & Network Design in Supply Chain ***(10 Hours)***

Inventory Management in Supply Chain environment, Multi echelon inventory management ,Network design in Supply Chain, Network design of Global Supply Chain, Alternate Channel of Distribution, Location decision in Supply Chain, Network Optimization Models, Network Design in Uncertain Environment , Flexibility in Supply Chain.

Module 4: Analytics in Supply Chain Management ***(10Hours)***

Optimal level of product availability in Supply chain. Time value of money in Supply Chain, Different types of analytics in Supply chain, Predictive modeling in forecasting in Supply Chain, representation of uncertainty in Supply Chain, Using decision tree for handling uncertainty, trends, challenges and future of supply chain.

Text Book:

1. T.A.S Vijayaraghavan , Supply Chain Analytics Ist Edition, 2021 Wiley Publications

Reference Book:

1. NPTEL Supply Chain Analytics Course PPT.
2. Supply Chain Analytics: Beginner's Guide - Second Edition 2nd Edition, Blokdyk, Create Space Independent Publishing Platform.

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT 612	FINANCIAL ANALYTICS	4	0	0	4

Course Objectives:

To provide students with a sound knowledge on how to gauge the relationship and effect among various financial data and make future predictions.

Course Outcomes:

After completion of this course the students will be able to:

1. Know the basics of financial data and software used in analysis those data.
2. Study the stationarity nature of data and bring them to stationary form.
3. Measure the short-run and long-run association among time series data.
4. Understand the basic requirements of panel data and various regression models to deal with panel data.

Module 1:

Data Analytics: Meaning, Types of Data: Source, distribution, scale, nature, structure such as Cross-Section Data, Time Series and Panel Data, Classical Linear Regression Model and diagnostic tests. Introduction to Software: Excel, Gretl, Eviews and Stata.

Module 2:

Time Series Analysis I: Stationary and Non-stationary Time series, Test of Stationarity, Stationary at Level, Stationary at Difference, Auto Regressive, Moving Average, ARMA Models of Stationary Time Series. Variance modelling: ARCH and GARCH, Summary Statistics, ACF, PACF, Correlogram,

Module 3:

Time Series Analysis II: Causality Between Variables: Granger Causality Test, Co-integration, Vector Auto Regression, Vector Error Correction Model.

Module 4:

Panel Data Analysis: Summary Statistics, Ordinary Least Squares Regression: Meaning, Dignostic Tests: Normality, Hetroscedasticity, Linearity, Multicolinearity, Autocorrelation. Fixed Effect and Random Effect Regression.

Readings:

1. Brooks Chris, (2002). Introductory Econometrics for Finance, Cambridge
2. Cambell, J.Y, Andrew, W. L.O & Mackinlay, A.C. (1996). The Econometrics of Financial Markets. Princeton, NJ: Princeton University Press.
3. Tsay, R.S. (2010). Analysis of Financial Time Series. (3rded.). New York, NY: John Wiley.
4. Enders, W. (2013). Applied Econometric Time Series. John Wiley.
5. Koop, G. (2006). Analysis of Financial Data. John Wiley.

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT 613	MARKETING ANALYTICS	4	0	0	4

Course Objective:

To develop expertise in leveraging data and analytics to optimize marketing strategies, understand customer behavior, and drive personalized engagement.

Course Outcomes:

1. Utilizing segmentation techniques and customer personas for targeted marketing strategies.
2. Applying marketing mix modeling and A/B testing to optimize campaign performance and budget allocation.
3. Evaluating CLV and predicting churn to inform retention strategies.
4. Using digital analytics and personalization methods to enhance customer experience across channels.

Module 1: Customer Segmentation & Targeting (*8 Hours)*

RFM (Recency, Frequency, Monetary) analysis, Behavioral segmentation using clustering techniques. Developing customer personas based on data. Management Focus: Tailoring marketing campaigns and product offerings.

Module 2: Marketing Mix Modeling & Campaign Optimization *(10 Hours)*

Attribution modeling (multi-touch) for marketing channels. Measuring ROI of marketing campaigns. A/B testing in marketing for conversion optimization. Management Focus: Allocating marketing budget effectively across channels.

Module 3: Customer Lifetime Value (CLV) & Churn Prediction *(12hours)*

Methods for calculating CLV (historical, predictive). Strategies for increasing CLV and reducing churn. Predictive modelling for identifying at-risk customers. Management Focus: Customer retention strategies and personalized interventions.

Module 4: Digital Analytics & Personalisation *(12Hours)*

Web analytics fundamentals (Google Analytics, Adobe Analytics). Understanding user journeys and conversion funnels. Introduction to recommender systems (collaborative filtering, content-based - conceptual). Personalization strategies across channels (email, web, app).

Textbooks:

1. Kumar, V., & Petersen, A. "Statistical Methods in Customer Relationship Management", 1st Edition, Wiley.
2. Wedel, M., & Kamakura, W. A. "Market Segmentation: Conceptual and Methodological Foundations", 2nd Edition, Springer.

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT 614	HUMAN RESORCE MANAGEMENT ANALYTICS	4	0	0	4

Course Objective:

This course aims to develop analytical competencies in Human Resource Management by integrating data-driven decision-making, HR metrics, and emerging technologies. It equips students with the skills to interpret and apply HR data using analytical tools and predictive models, ensuring ethical governance. The course prepares students to align human capital strategies with organizational objectives through evidence-based, tech-enabled HR practices.

Course Outcomes:

Upon successful completion of the course, students will be able to:

5. Explain the foundational concepts, frameworks, and strategic significance of HR analytics and apply ethical principles and data governance practices in analytics implementation. *(Module 1: Understand, Apply)*
6. Develop HR metrics and dashboards using data from various HR systems and interpret trends to support evidence-based decision-making. *(Module 2: Apply, Analyze)*
7. Apply statistical and machine learning techniques for predictive HR analytics, including workforce forecasting, attrition prediction, and talent modeling. *(Module 3: Apply, Analyze)*
8. Evaluate the use of AI, ONA, and other digital technologies in HR, and design responsible analytics solutions aligned with organizational goals and ethical standards. *(Module 4: Evaluate, Create)*

Module 1: Foundations of HR Analytics and Value Frameworks *(10 Hours)*

Introduction to HR analytics: Evolution, scope, and contemporary relevance; Strategic role of analytics in evidence-based HRM; Frameworks: Analytics Process Model (APM), LAMP, and HCM:21; Human capital valuation and its business impact; Types and levels of HR

analytics: Descriptive, Diagnostic, Predictive, Prescriptive; Ethical use of people data, algorithmic bias, and legal compliance (GDPR, DPDP).

Module 2: HR Metrics, Dashboards, and Data Interpretation *(10 Hours)*

HR data sources: HRIS, surveys, ATS, exit interviews, L&D platforms; Designing and applying HR metrics across the employee lifecycle (recruitment, onboarding, training, performance, engagement, retention); KPI development and benchmarking best practices; HR Scorecard vs Balanced Scorecard; Creating impactful HR dashboards; HR analytics tools and software's.

Module 3: Predictive Analytics and Talent Intelligence *(10 Hours)*

Forecasting models for strategic workforce planning; Attrition prediction using statistical and ML techniques (logistic regression, decision trees); L&D analytics: Skill gap mapping, training ROI analysis; Performance modeling and variable pay optimization; DEI analytics using demographic and sentiment data; Internal mobility models.

Module 4: AI, Future Skills, and Ethical Analytics in HR *(10 Hours)*

Applications of AI/ML in HR: Resume parsing, sentiment analysis, chatbot automation; Organizational Network Analysis (ONA) for collaboration mapping; Skill-based talent frameworks and internal gig marketplaces; Calculating and communicating ROI for strategic HR interventions; Responsible AI: Bias detection, fairness, explainability in HR algorithms; HR analytics maturity model and digital transformation trends in the HR tech landscape.

Text Books:

5. Koene, B. A. S., and Colakoglu, S. N. (Eds.). (2024). *HRM and digital transformation: Practice, research and pedagogy*. Springer.
6. Weller, I. (2023). *HR analytics: Understanding the uses and impacts of HR metrics and data.* Routledge.
7. Tambe, P., Cappelli, P., & Yakubovich, V. (2022). *The future of HR: Using analytics to drive business success*. Harvard Business Review Press.
8. Fitz-enz, J., and Mattox, J. R. (2022). *People analytics in the era of Big Data: Changing the way you attract, acquire, develop, and retain talent* (2nd ed.). Wiley.

Reference Books:

3. Minbaeva, D. (2022). *Strategic HR analytics: Measurement, tools, and strategies*. Cambridge University Press.
4. Edwards, M. R., and Edwards, K. (2021). *Predictive HR analytics: Mastering the HR metric* (2nd ed.). Kogan Page.

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT BA 603	BUSINESS STATISTICS AND ANALYTICAL FOUNDATIONS	4	0	0	4

Course Objective

To provide a robust foundation in statistical concepts and methodologies essential for advanced business analytics, ensuring all students have a common and strong quantitative base.

Course Outcomes

1. Understanding distinctions between descriptive, predictive, and prescriptive analytics and developing regression forecasting fundamentals.
2. Applying predictive insights through feature selection, data preparation, and effective communication of model results.
3. Applying statistical modeling in business scenarios and translating results into actionable insights.
4. Recognizing ethical considerations in predictive analytics, including bias, privacy, and explainability.

Module 1: Analytics, Regression & Forecasting Fundamentals ***(10 Hours)***

Distinction from descriptive and prescriptive analytics, Assumptions of regression and diagnostics for model validation, Basic Model Evaluation Metrics: For Regression: Mean Absolute Error (MAE), Root Mean Squared Error (RMSE) – managerial interpretation. For Classification: Accuracy, Confusion Matrix (True Positives, False Positives, True Negatives, False Negatives) – understanding their business implications. Concept of overfitting and underfitting in simple terms. Common business problems solved by predictive analytics (e.g., customer churn, sales forecasting, credit risk).

Module 2: Applying & Communicating Predictive Insights ***(12 Hours)***

Feature Selection & Data Preparation for Prediction:(Understanding the importance of relevant variables (features) for a model. Conceptual overview of data scaling and one-hot

encoding (without deep dives into the mechanics).Handling missing values and outliers in the context of predictive modeling.) , Case Studies in Foundational Predictive Analytics:Analyzing real-world simplified business cases where predictive models are used (e.g., predicting website conversion rates, assessing loan applicant risk).Discussion of data sources and challenges in collecting data for predictive tasks. Communicating Predictive Model Results: Translating model output (e.g., regression coefficients, classification probabilities) into clear, actionable business insights. Developing effective narratives and visualizations for predictive findings. Presenting model confidence and limitations to business leaders. Management Focus: Bridging the gap between data science and business strategy.

Module 3: Business Applications of Statistical Modelling *(8 Hours)*

Case studies on applying regression for sales forecasting, cost prediction, risk assessment. Understanding the limitations of statistical models and ethical considerations in data collection. Communicating statistical findings to non-technical stakeholders.

Module 4: Ethical Considerations in Predictive Analytics *(6 Hours)*

Awareness of potential biases in data leading to biased predictions. Privacy concerns related to using personal data for prediction. The importance of model explainability (interpreting why a prediction was made, conceptually)

Textbooks:

1. James, G., Witten, D., Hastie, T., & Tibshirani, R. "An Introduction to Statistical Learning", 2nd Edition, Springer.
2. Bowerman, B. L., O'Connell, R. T., & Murphree, E. S. "Business Statistics in Practice", 8th Edition, McGraw-Hill Education.

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT BA 604	DATA ANALYSIS LIFE CYCLE	4	0	0	4

Course Objective

To provide students with a comprehensive understanding of the end-to-end data analysis life cycle, from problem definition and data acquisition to model deployment, communication of insights, and continuous improvement.

Course Outcomes

1. Framing business problems within DALC frameworks and aligning analytics initiatives with strategy.
2. Acquiring and preparing data while conducting exploratory analysis to discover initial insights.
3. Building and evaluating models conceptually to drive business implications.
4. Deploying insights, communicating findings, and continuously improving analytical solutions while measuring business value.

Module 1: Foundations of the Data Analysis Life Cycle & Problem Framing ***(10Hours)***

Overview of the Data Analysis Life Cycle: Introduction to DALC frameworks (e.g., CRISP-DM, SEMMA, Agile Analytics). Understanding the iterative and interconnected nature of DALC stages. Role of different stakeholders (business users, data analysts, data scientists, data engineers) at each stage. Business Understanding & Problem Framing: Translating ambiguous business challenges into clear, actionable analytical questions. Identifying key business objectives and metrics. Stakeholder interviews, requirements gathering, and managing expectations. Developing a "Statement of Work" or "Analytics Project Charter." Data-Driven Culture & Analytics Strategy: Fostering a data-driven mindset within an organization. Aligning individual analytical projects with the broader corporate data strategy. Identifying opportunities for data to create competitive advantage. Project Management for Analytics Initiatives: Basic project planning for analytics (scope, timeline,

resources). Risk identification and mitigation in data projects. Agile methodologies in analytics (e.g., sprints for analytics projects).

Module 2: Data Acquisition, Preparation & Exploratory Analysis *(10 Hours)*

1. Data Sources & Acquisition Strategies: Internal vs. External data sources (CRM, ERP, web logs, social media, open data). Methods of data collection (databases, APIs, web scraping – conceptual). Introduction to Big Data concepts (Volume, Velocity, Variety) and their impact on acquisition. Conceptual: Data Lakes, Data Warehouses, and Data Marts as destinations. 2. Data Preparation: Cleaning, Transformation & Integration: Challenges of "dirty data" (missing values, outliers, inconsistencies). Strategies for data cleaning and validation (managerial and conceptual technical approaches). Data integration from disparate sources (conceptual ETL/ELT processes). Feature engineering: creating new variables for analysis (conceptual). Data Quality & Governance: Establishing data quality standards and metrics. Roles and responsibilities in data governance. Impact of poor data quality on business decisions. Data security, privacy, and compliance considerations (e.g., GDPR, CCPA). Exploratory Data Analysis (EDA) & Initial Insights: Techniques for initial data exploration (summary statistics, visualization). ○ Identifying patterns, trends, and anomalies. Formulating initial hypotheses for further analysis.

Module 3: Analytical Modeling, Evaluation & Interpretation *(12 Hours)*

Choosing the Right Analytical Approach: Matching business questions to analytical techniques (e.g., forecasting for prediction, clustering for segmentation, regression for drivers). Overview of common model types (regression, classification, clustering, time series). Introduction to machine learning concepts: supervised vs. unsupervised learning. Model Building Fundamentals (Conceptual & Tool-Driven): Data splitting (training, validation, test sets). Conceptual understanding of algorithms (e.g., how a decision tree makes decisions, how linear regression works). Model Evaluation & Validation: Key metrics for different model types (MAE, RMSE, R-squared for regression; Accuracy, Precision, Recall, F1-Score, AUC-ROC for classification). Understanding overfitting and underfitting and their implications. Cross-validation concepts for robust evaluation. Interpreting Model Results & Business Implications: Translating statistical/algorithmic outputs into clear,

actionable business insights. ○ Understanding feature importance and drivers. Scenario analysis based on model predictions.

Module 4: Insight Deployment, Communication & Continuous Improvement (10 Hours)

Deployment & Operationalization of Analytical Solutions:Bridging the "last mile" from model to action. Methods of deployment (e.g., integrating models into business applications, automated reporting). Conceptual: Introduction to MLOps (Model Operationalization) principles – monitoring, re-training, versioning. Change management: encouraging adoption of data-driven decisions. Data Storytelling & Effective Communication: Crafting compelling narratives from data. Tailoring messages for different audiences (technical, executive, operational). Principles of effective data visualization for communication (going beyond dashboards). Presentation skills for analytical insights. Monitoring, Maintenance & Continuous Improvement: Setting up performance monitoring for deployed models and dashboards. ○ Recognizing model drift and trigger points for retraining. establishing feedback loops from business users to analytics teams. Iterative improvement cycles for analytical products. Measuring Business Value & ROI of Analytics: Frameworks for quantifying the financial and strategic impact of analytical projects (e.g., increased revenue, cost savings, improved efficiency, enhanced customer experience). Developing KPIs and metrics to track the success of analytical initiatives. Post-implementation review and benefit realization. Data Privacy, Security & Compliance: Understanding key data privacy regulations (GDPR, CCPA, etc.) and their impact on data analysis. Best practices for data anonymization, pseudonymization, and encryption (conceptual).

Textbooks:

1. Provost, F., & Fawcett, T. "Data Science for Business", 1st Edition, O'Reilly Media.
2. Baesens, B. "Analytics in a Big Data World: The Essential Guide to Data Science and its Applications", 1st Edition, Wiley.

Course Category	Course Code	Course Title	L	P	T	Credits
DSE	MGT BA 605	ADVANCED BUSINESS ANALYTICS LAB-1	4	0	0	4

Course Objective

To provide hands-on experience in applying machine learning techniques and analytical tools to solve business problems

Course Outcomes

1. Implementing predictive models like logistic regression, decision trees, and clustering for customer insights.
2. Creating dashboards and visualizations to highlight key performance metrics and operational patterns.
3. Solving optimization and simulation problems using Excel Solver and modeling efficiencies.
4. Exploring AI techniques such as sentiment analysis and generative AI to enhance marketing and analytical tasks.

Contents

1. Build and evaluate a Logistic Regression model to predict customer churn 2. Forecast daily sales using a simple linear regression model with time-based features.
2. Apply a Decision Tree model to classify loan applicants as low or high-risk based on provided features.
3. Segment customers using K-Means clustering based on provided RFM (Recency, Frequency, Monetary) values.
4. Identify anomalous data points in a small operational dataset using Isolation Forest.
5. Create a single-page interactive dashboard showing key sales performance indicators (KPIs).
6. Visualize product performance trends and comparisons to identify top/bottom performers.

7. Build a dashboard to track headcount trends and employee turnover rates 9. Visualize website traffic sources and basic page views
8. Use Excel Solver to find the optimal production quantities for two products given two resource constraints to maximize profit.
9. Simulate a simple resource allocation problem (e.g., assigning tasks to two workers with varying efficiencies) to estimate overall completion time.
10. Perform sentiment analysis on a small, provided list of product reviews using a pre-trained NLP model.
11. Experiment with a Generative AI model to produce short marketing copy for two different products/campaigns based on specific prompts.