ಮಂಗಳೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ

MANGALORE UNIVERSITY

(Accredited by NAAC Grade)

ಕ್ರಮಾಂಕ/No. : MU/ACC/CR.22/2025-26/A2

ಕುಲಸಚಿವರಕಛೇರಿ
ಮಂಗಳಗಂಗೋತ್ರಿ – 574 199
Office of the Registrar
Mangalagangothri – 574 199
ದಿನಾಂಕ/Date:31.07.2025

NOTIFICATION

Sub: Introduction of new soft core courses in Master of Business Administration [M.B.A.] Programme.

Ref: Academic Council approval vide agenda No.:ಎಸಿಸಿ:ಶೈ.ಮ.ಸಾ.ಸ.1:1 (2025-26) dtd 18.07.2025.

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The syllabus of new soft core courses in Master of Business Administration [M.B.A.] Programme which has been approved by the Academic Council at its meeting held on 18.07.2025 is hereby notified for implementation with effect from the academic year 2025-26 and onwards.

Copy of the Syllabus shall be downloaded from the University Website (www.mangaloreuniversity.ac.in)

REGISTRAR

To,

1. The Registrar (Evaluation), Mangalore University.
2. The Chairman, PG Board of Studies in MBA, Dept. of MBA, Mangalore University.
3. The Chairman, Dept. of MBA, Mangalore University.
4. The Principals of the Colleges concerned.
5. The Asst. Registrar (ACC), O/o the Registrar, Mangalore University.
6. The Director, DUIMS, Mangalore University – with a request to publish in the website.
7. Guard File.

Soft Core Group -7 : Business Analytics (3rd Semester)

Course Code	Course Title	Instruction Hours/Week	Duration of the Exam	Marks			Credit
				IA	Exam	Total	
MBAS 322	**Fundamentals of Business Analytics**	4	3	30	70	100	4
MBAS 323	**Data Analytics with Python and Power BI**	4	3	30	70	100	4
MBAS 324:	**Data Science**	4	3	30	70	100	4

Soft Core Group -7 : Business Analytics (4th Semester)

MBAS 422	**Data Visualization**	4	3	30	70	100	4
MBAS 423	**Big Data and Cloud Computing**	4	3	30	70	100	4
MBAS 424	**Application of Business Analytics**	4	3	30	70	100	4

Name of the Program: Master of Business Administration (MBA)
MBAS 322: FUNDAMENTALS OF BUSINESS ANALYTICS

Course Credits	No. of Hours Per Week	Total No. of Teaching Hours
4 Credits	4 Hours	56 Hours

Pedagogy: Classroom Lecture, Lab Exercises, Seminars, Assignments, Case Studies, etc.

Examination: 30 marks continuous evaluation and 70 marks final examination. For the 30 marks allocated to continuous evaluation, at least two practical examinations must be conducted.

Objectives:

1. To provide an overview of business analytics fundamentals, scope, and ethical aspects.
2. To build knowledge of data sources, pre-processing, and data quality.
3. To apply statistical techniques for analysing and interpreting business data.
4. To build practical data analysis skills using Excel for business decision-making.
5. To explore how analytics is applied across key business functions.
6. To train learners in decision modelling and optimization for practical applications.

Course Outcomes: On completion of this course, students will be able to:

1. Explain the role of different types of analytics in decision-making and ethical data use.
2. Identify and pre-process various data types while ensuring data quality.
3. Analyse business problems using appropriate statistical methods and interpret the results.
4. Solve business problems using Excel tools and create interactive dashboards.
5. Apply analytics techniques to improve performance in diverse business domains.
6. Formulate and solve optimization problems using decision models for better outcomes.

Syllabus	Hours
Module 1: Introduction to Business Analytics	7
Introduction of business analytics- definition, evolution, and scope. Types of analytics (descriptive, predictive, prescriptive) and their roles in decision-making. Analytics lifecycle and the difference between business analytics from business intelligence, and data science.	
Module 2: Data Sources and Data Quality	7
Introduction to structured, semi-structured, and unstructured data, and the difference between internal vs. external and primary vs. secondary sources. Data acquisition and pre-processing techniques- handling missing values, outliers, and noise. Importance of data quality and governance. Introduction to tools like Excel, SPSS, Power BI, Tableau, Python, and R for data handling and analysis. Emerging Business Analytics tools. **Lab Exercise** - Data Classification Task.	
Module 3: Statistical Techniques for Business Analytics (Theory and Lab Exercise)	13
Application of statistical methods to analyse business data. Descriptive statistics, correlation, linear regression - 2 variables, and basics of time series analysis. Importance of interpreting outputs and deriving insights to support strategic, data-driven decisions.	
Module 4: Excel for Business Analytics (Theory and Lab Exercise)	11
Excel for data analysis through lookup functions, pivot tables, charts, and conditional formatting. Application of Solver for optimization and performing scenario and sensitivity	

analyses. Build dashboards to communicate findings and solve practical business problems using Excel.	
Module 5: Analytics Applications in Business Functions	7
Application of analytics in marketing, finance, HR, HA, supply chain, and other domains. Perform customer segmentation, credit scoring, attrition analysis, and Attrition Dashboard creation and demand forecasting. **Lab Exercise** - RFM Analysis in Excel: Segment customers based on Recency, Frequency, and Monetary value using Excel formulas, Revenue Forecasting.	
Module 6: Decision Models and Optimization Techniques	11
Decision-making under certainty and uncertainty using linear and integer programming. Application of Decision Models and Optimization Techniques to resource allocation, logistics, and project selection. **Lab Exercise** - Linear Programming in Excel Solver, Decision Tree Construction, What-if Analysis, Forecasting Techniques.	

Reference:

1. Camm, J. D., Cochran, J. J., Fry, M. J., & Ohlmann, J. W. (2021). *Business analytics: Descriptive, predictive, prescriptive* (5th ed.). Cengage Learning.
2. Schniederjans, M. J., Schniederjans, D. G., & Starkey, C. M. (2014). *Business analytics: Principles, concepts, and applications*. Pearson.
3. Pochiraju, B., & Seshadri, S. (Eds.). (2019). *Essentials of business analytics: An introduction to the methodology and its applications*.
4. Nelson, G. S. (2018). *The analytics lifecycle toolkit: A practical guide for an effective analytics capability*.

Name of the Program: Master of Business Administration (MBA)
MBAS 323: DATA ANALYTICS WITH PYTHON AND POWER BI

Course Credits	No. of Hours Per Week	Total No. of Teaching Hours
4 Credits	4 Hours	56 Hours

Pedagogy: Classroom Lecture, Lab Exercises, Seminar, Assignments, Case studies, etc.

Examination: 30 marks continuous evaluation and 70 marks final examination. For the 30 marks allocated to continuous evaluation, practical examination(s) to be conducted along with other evaluation modes.

Objectives:

1. To introduce the foundational Python programming concepts essential for data analytics.
2. To equip learners with data manipulation and cleaning techniques using pandas and NumPy.
3. To familiarize students with Power BI's interface and tools for data connection and transformation.
4. To introduce data modelling concepts and DAX functions in Power BI for efficient data analysis.
5. To teach the creation and deployment of interactive dashboards using Power BI.
6. To develop skills in data manipulation and analysis using pandas and NumPy in Python.

Course Outcomes: On completion of this course, students will be able to:

1. Analyse and interpret marketing data for strategic decision-making and ROI evaluation.
2. Apply financial models and visualization tools to support financial planning and risk analysis.
3. Generate insights from hospital data to support strategic healthcare administration.
4. Build data models and apply DAX for calculations in Power BI.
5. Design and publish dynamic dashboards with interactive features.
6. Analyze and visualize data using pandas, NumPy, and Matplotlib.

Syllabus	Hours
Module 1: Introduction to Python Programming (Theory and Lab Exercise)	7
Introduction to Python Programming, Python syntax, variables, data types, and operators. Control structures: loops, conditional statements.	
Module 2: Data Analysis with Python (Theory and Lab Exercise)	10
Functions and modular coding. Lists, basics of tuples, dictionaries, sets, arrays, and String operations. Input/output handling. Writing reusable scripts.	
Module 3: Introduction to Power BI (Theory and Lab Exercise)	10
Power BI– Meaning, Significance and components. Power BI interface- Desktop and Service. Connecting to data sources (Excel, SQL, web, SharePoint). Data transformation with Power Query. Cleaning and shaping data. Creating basic reports and visualizations. Application of Python Scripts in data management and visualization. Data types, column	

transformations, renaming, replacing values.	
Module 4: Data Modelling and DAX (Theory and Lab Exercise)	
Process of creating Data Model in Power BI. Relationships between tables (one-to-many, many-to-many). Star and snowflake schema design. Introduction to DAX (Data Analysis Expressions). Calculated columns and measures. Aggregations- SUM, AVERAGE, COUNTROWS. Time intelligence- YTD, MTD, QTD. Measures vs. calculated columns.	
Module 5: Interactive Dashboards and Publishing (Theory and Lab Exercise)	10
Steps in creating an interactive Dashboard in Power BI. Designing advanced dashboards with slicers, filters, cards, and charts. Bookmarks, drill-downs, and tooltips. Power BI Service: workspace, reports, and dashboards. Sharing and publishing reports securely. Gateway setup and automatic refresh.	
Module 6: Analytics Artistry in Power BI	
Introduction to analytic artistry in Power BI, Graphical Glory, Smart Graphs, Texture size data in power BI, matrix mastery, Conditional formatting in texture data, Hierarchies in matrix, Filters & Slicers in Power BI, filters on different data types, Cards and KPI's in Power BI, Numeric cards, Texture Cards, Actions to enhance data visualisation, elements in power BI, Artificial Intelligence in Business Intelligence.	

Reference:

1. Data Action Lab. (2024). *Power BI for beginners*.
2. McKinney, W. (2017). *Python for data analysis: Data wrangling with pandas, NumPy, and IPython*. O'Reilly Media.
3. Motwani, B. (2020). *Data analytics using Python*. Wiley India Pvt. Ltd.
4. Mukhopadhyay, S., & Samanta, P. (2022). *Advanced data analytics using Python: With architectural patterns, text and image classification, and optimization techniques*.
5. Nelli, F. (2015). *Python data analytics: Data analysis and science using pandas, matplotlib, and the Python programming language*. Apress.
6. Microsoft Press. (2016). *Introducing Microsoft Power BI*. Microsoft Corporation.
7. Rego Consulting. (2024). *Power BI dashboards: Beginner*. Rego Consulting.
8. Microsoft Press. (n.d.). *Introducing Microsoft Power BI*. Microsoft Corporation.
9. Lalwani, L. (n.d.). *Power BI: An in-depth understanding*. Lokesh Lalwani.
10. Data Mozart. (2022). *End-to-end analytics with Microsoft Power BI*.

Name of the Program: Master of Business Administration (MBA)
MBAS 324: DATA SCIENCE

Course Credits	No. of Hours Per Week	Total No. of Teaching Hours
4 Credits	4 Hours	56 Hours

Pedagogy: Classroom Lecture, Lab Exercises, Seminars, Assignments, Case Studies, etc.

Examination: 30 marks continuous evaluation and 70 marks final examination. For the 30 marks allocated to continuous evaluation, practical examination(s) to be conducted along with other evaluation modes.

Objectives:

1. To introduce the fundamentals, lifecycle, and applications of data science across domains.
2. To develop skills in designing surveys and collecting data using digital and traditional methods.
3. To equip students with techniques to clean, pre-process, and manage large datasets.
4. To provide a foundation in machine learning concepts for data-driven decision-making.
5. To evaluate and optimize machine learning models effectively.
6. To create awareness of ethical, legal, and social issues in data handling and analysis.

Course Outcomes: On completion of this course, students will be able to:

1. Explain key concepts of data science and its relevance in real-world sectors.
2. Apply data collection techniques, including surveys and web scraping.
3. Clean and prepare raw data for analysis using tools like Python and Jupyter.
4. Build and evaluate basic ML models for classification and prediction.
5. Learners will evaluate models and improve them using validation and tuning techniques.
6. Identify and address ethical risks in data collection, modelling, and reporting.

Syllabus	Hours
Module 1: Introduction to Data Science	8
Introduction to Data Science – Evolution of Data Science: Growth & Innovation, Roles in Data Science, Data Science Cycle. Data Science in Business, Engineering, Public Policy, Education, HealthCare, in Sports and Entertainment. Trends and Issues in Data. Data and Datasets – Data, Types of Data, Datasets. Using Technology for Data – Spread sheet Programs, Programming Languages, Other Data Analysis/Visualization Tools.	
Module 2: Data Collection and Acquisition	8
Overview of Data Collection Methods - Types of Data, Collecting Data Through Experiments. Data sourcing methods from different DBMS- Mongo DB and MySQL. Survey Design and Implementation - Designing the Survey, Open-Ended Versus Closed-Ended Questions, Avoiding Bias in Survey Questions, Sampling Techniques, Sampling Error, Sampling Bias, Measurement Error. Web Scraping and Social Media Data Collection - Web Scraping, Social Media Data Collection.	
Module 3: Data Cleaning and Pre-processing	10
Steps in Pre-processing. Data Cleaning – Steps, Methods, Process, and Tools for Data	

Cleaning in Data Mining. Handling Missing Data and Outliers. Data Standardization, Transformation, and Validation. Data Normalization, Data Transformation, Dealing with Noisy Data, Data Validation, Data Aggregation, Text Pre-processing, Handling Large Datasets -Data Compression, Data Storage, Data Indexing, Data Chunking, Database Management Systems. **Lab Exercise** -Data Science with Python, Jupyter Notebook on Google Collaborator, Using Python to Scrape Data from the Web, Regular Expressions in Python, Parsing and Extracting Data, Processing and Storing Data.

Module 4: Basics of Machine Learning	9

Meaning and Introduction to Machine Learning. Difference between Artificial Intelligence, Machine Learning and Deep Learning. Data Pre-processing in machine learning, machine learning life cycle, supervised vs. Unsupervised Learning, Variations and Hybrid Models, Training and Testing a Model, Model Building, Measures of Accuracy – Classification, Overfitting and Underfitting, Classification Using Machine Learning.

Module 5: Model Evaluation and Optimization Techniques	13

Model evaluation fundamentals: distinguishing between in-sample and out-of-sample performance. Introduction to key performance metrics: confusion matrix, accuracy, precision, recall, F1-score, ROC-AUC for classification problems. Concept and calculation of Mean Squared Error (MSE) and R-squared (R^2) for regression. Residual analysis and plotting. Understanding bias-variance trade-off. Basics of cross-validation (K-fold) using scikit-learn. Hyper parameter tuning using Grid Search.

Module 6: Ethics in Data Science Cycle	8

Introduction. Ethics in Data Collection - Regulatory Compliance – GDPR and India's DPDP Act. Industry and Global Standards, Regulatory Compliance Teams, Privacy and Informed Consent, Data Security, Intellectual Property, Security for Quantitative and Qualitative Data, Data Sharing. Ethics in Data Analysis and Modeling - Bias and Fairness, Factors That Might Lead to Bias & Fairness. Potential Misuse of Data Analysis and Modeling, Data Anonymization, Data Validation. Ethics in Visualization and Reporting – Accurate Representation, Data Source Attribution, Accessibility, and Inclusivity

Reference:

1. Ault, S., Liao, S., & Musolino, L. (2025). *Principles of data science*. Open Stax.
2. Blum, A., Hopcroft, J., & Kannan, R. (2020). *Foundations of data science*. Cambridge University Press.
3. EMC Education Services. (2015). *Data science and big data analytics: Discovering, analyzing, visualizing, and presenting data*. Wiley.
4. Provost, F., & Fawcett, T. (2013). *Data science for business: What you need to know about data mining and data-analytic thinking*. O'Reilly Media.
5. Bharambe, M., & Patil, H. (2022). *Foundations of data science* (2nd ed.). MES's Abasaheb Garware College.
6. Khanna, A., Gupta, D., Bhattacharyya, S., Pólkowski, Z., & Castillo, O. (Eds.). (2020). *Data analytics and management*. Springer.
7. Akerkar, R., & Sajja, P. S. (2023). *Intelligent techniques for data science*. Springer.

Name of the Program: Master of Business Administration (MBA)
MBAS 422: DATA VISUALIZATION

Course Credits	No. of Hours Per Week	Total No. of Teaching Hours
4 Credits	4 Hours	56 Hours

Pedagogy: Classroom Lecture, Lab Exercises, Seminars, Assignments, Case studies, etc.

Examination: 30 marks continuous evaluation and 70 marks final examination. For the 30 marks allocated to continuous evaluation, practical examination(s) to be conducted along with other evaluation modes.

Objectives:

1. To introduce learners to the fundamentals and principles of effective data visualization.
2. To equip learners with techniques to choose and design appropriate charts for different data types.
3. To develop skills in exploratory data analysis and storytelling using visualization tools.
4. To analyse advanced visualization types and integrate real-time data into dashboards.
5. To introduce Tableau basics, navigation, and simple visualizations.
6. To provide training in advanced data connections and interactive dashboard features.

Course Outcomes: On completion of this course, students will be able to:

1. Identify core visualization principles and evaluate chart effectiveness.
2. Select and create appropriate visualizations for specific data patterns and contexts.
3. Analyse data visually and build compelling narratives using storytelling elements.
4. Design interactive dashboards using advanced visual types and live data sources.
5. Create basic dashboards and manage data and metadata in Tableau.
6. Build complex visualizations with LOD, filters, and storytelling tools.

Syllabus	Hours
Module 1: Foundations of Data Visualization	7
Introduction to data visualization and its importance in analytics and business decision-making. Keys Factors of Data Visualization. Data Visualization Tools. Types of charts and graphs. Colour – Components, Types of Colour mapping, colour theory, visual hierarchy, typography, and layout. Human perception and cognition in chart reading. Foundational guidelines for effective design.	
Module 2: Visualization Techniques and Design Best Practices	8
Choosing the right chart for the data type. Static vs. interactive visuals. Comparison, distribution, composition, and relationship visualizations. Application of design principles in real scenarios. Understanding accessibility and inclusivity in design. **Lab Exercise** – Chart types, Matching and Critique, and Seaborn Visualization.	
Module 3: Exploratory Data Analysis and Storytelling	8
Visual data profiling techniques: univariate and multivariate analysis. Detecting patterns, outliers, and trends. Developing narrative structures in dashboards and reports. Telling compelling data stories with Tableau and Excel. **Lab Exercise** - Bridging EDA (Exploratory Data Analysis) and reporting through consistent visual grammar.	
Module 4: Advanced Visualizations and Integration	14

Challenges in Data-synchronization from various Data sources and platforms. Creating geospatial (maps), temporal (time series), and hierarchical visualizations. Advanced Data Visualization Techniques - Interactive Dashboards, Automation Techniques using AI and ML. Geospatial Visualization, Heat Maps & Density Maps. Visualizing Geospatial Data - Geospatial Visualization - Choropleth Maps, Point Map, Proportional symbol map, Cluster Map – Types, Applications of Geospatial Visualization. **Lab Exercise** - Power BI visuals: Tree maps, Sankey diagrams, and decomposition trees. Integration of live data sources. Real-time dashboards and alerting mechanisms. Use of animations and transitions for dynamic insights delivery.	
Module 5: Introduction to Tableau (Theory and Lab Exercise)	8
Introduction to tableau, Key Features of Tableau, Navigation in Tableau, Types of Files and Data in Tableau, Extraction of Data from Tableau, Field Operations in Tableau, Metadata in tableau, editing metadata in tableau, Creating Tableau Worksheets, creating data visualization in tableau, Features of Tableau Dashboards, Building a Tableau Dashboard, Types of Tableau Dashboards.	
Module 6: Tableau with Metadata and Dashboarding (Theory and Lab Exercise)	11
Data connection methods in Tableau: joins, blending, unions. Working with metadata and editing data sources. Building dashboards with filters, actions, parameters, and storytelling features. Advanced chart types: bullet graphs, boxplots, scatter matrices. Data granularity and level of detail (LOD) calculations.	
Reference: 1. Knaflic, C. N. (2015). *Storytelling with data: A data visualization guide for business professionals*. Wiley. 2. Dougherty, J., & Ilyankou, I. (2021). *Hands-on data visualization: Interactive storytelling from spreadsheets to code*. O'Reilly Media. 3. Sosulski, K. (2019). *Data visualization made simple: Insights into becoming visual*. Routledge. 4. Singh, P. (2020). *Advance data visualization*. Lovely Professional University. 5. Basra, N. K., Singh, D., & Kaur, K. (2025). *Fundamentals of data handling and visualization*. Bhumi Publishing.	

Name of the Program: Master of Business Administration (MBA)
MBAS 423: BIG DATA AND CLOUD COMPUTING

Course Credits	No. of Hours Per Week	Total No. of Teaching Hours
4 Credits	4 Hours	56 Hours

Pedagogy: Classroom Lecture, Lab Exercises, Seminars, Assignments, Case studies, etc.

Examination: 30 marks continuous evaluation and 70 marks final examination. For the 30 marks allocated to continuous evaluation, practical examination(s) to be conducted along with other evaluation modes.

Objectives:

1. To understand Big Data characteristics, sources, and value in modern ecosystems.
2. To explore distributed frameworks and scalable architectures for Big Data.
3. To Learn real-time stream processing tools for high-velocity analytics.
4. To Grasp cloud computing principles, models, and services.
5. To Gain hands-on experience in secure cloud deployment and compliance.
6. To apply machine learning and BI tools for predictive analytics.

Course Outcomes: On completion of this course, students will be able to:

1. Explain Big Data's role and features in data-driven systems.
2. Use Hadoop, NoSQL, and distributed tools for scalable processing.
3. Apply Kafka and Flink for real-time data analytics.
4. Describe cloud models and deploy services via IaaS, PaaS, and SaaS.
5. Manage secure, compliant cloud services.
6. Build predictive models and BI dashboards for strategic insights.

Syllabus	Hours
Module 1: Introduction to Big Data and Ecosystem	7
Big Data and its importance. Characteristics of Big Data- Volume, Velocity, Variety, Veracity. Sources of Big Data and data acquisition techniques. Big Data storage and processing options. Tools and technologies: Greenplum, Informatica. Big v/s Thick data. Security, compliance, and governance for Big Data.	
Module 2: Scalable Computing and Distributed Data Frameworks	8
Scalable computing models and distributed processing in Big Data environments. Introduction to Hadoop ecosystem: HDFS, MapReduce, Hive, HBase. NoSQL databases and sharding techniques. Cloud-based storage and retrieval systems: Amazon S3 and Google Cloud Storage. Big Data ingestion and ETL pipelines. Data partitioning, replication, and consistency models.	
Module 3: Data-Driven Decision Making and Strategy (Theory and Lab Exercise)	10
Introduction to data as a strategic business asset. The value of data in modern organizations. Data-driven v/s intuition-based decision making. The role of data in functional areas – Marketing, Finance, HR, Operations. Frameworks for data-driven decision making - DIKW (Data-Information-Knowledge-Wisdom) model, Balanced	

Scorecard and KPI dashboards. **Lab Exercise** - dashboard creation that supports a strategic decision using Excel/ Tableau.	
Module 4: Cloud Computing Fundamentals and Services	11
Definition and evolution of cloud computing. Characteristics, advantages, and limitations of cloud models. Cloud service models: IaaS, PaaS, SaaS. Deployment models: Public, Private, Hybrid, Community. Virtualization, containers, and orchestration. Cloud infrastructure components: compute, storage, networking. Cloud-native application development.	
Module 5: Cloud Platforms, Labs, and Security Compliance	11
Understanding of Cloud Applications requirement, development and Deployment methods using AWS, Azure, or Google Cloud. Storage, compute, and networking services in practice. Identity and access management in cloud platforms. Data protection techniques: encryption, masking, and tokenization. Security risks in multi-tenant systems. Compliance standards and audit mechanisms: GDPR, HIPAA, ISO/IEC 27001.	
Module 6: Predictive Analytics and Business Intelligence Tools	11
Supervised and unsupervised learning methods: classification, regression, clustering. Techniques: K-means, hierarchical clustering, Apriori algorithm, anomaly detection. Model evaluation metrics and validation techniques. Understanding of Integration Techniques of ML models with Big Data. Overview of Business Intelligence tools: Cognos, Pentaho, MicroStrategy. **Lab Exercise** - Designing dashboards and visual analytics. Use of BI platforms in decision support systems and strategic planning.	
Reference: 1. Kumar, V., & Singh, A. (2021). *Big data analytics & cloud computing*. 2. Bahrami, M., & Singhal, M. (2015). Big data and cloud computing. 3. Zhang, Y. (2019). *Big data stream processing in the cloud* (Doctoral dissertation). Deakin University. 4. Abbott, D. (2014). *Applied predictive analytics: Principles and techniques for the professional data analyst*. Wiley 5. Kumar, V., & Singh, A. (2021). *Big data analytics & cloud computing*. 6. Kamal, R., & Saxena, P. (n.d.). *Big data analytics*. Tata McGraw-Hill.	

Name of the Program: Master of Business Administration (MBA)
MBAS 424: APPLICATION OF BUSINESS ANALYTICS

Course Credits	No. of Hours Per Week	Total No. of Teaching Hours
4 Credits	4 Hours	56 Hours

Pedagogy: Classroom Lecture, Lab Exercises, Seminars, Assignments, Case studies, etc.

Examination: 30 marks continuous evaluation and 70 marks final examination. For the 30 marks allocated to continuous evaluation, practical examination(s) to be conducted along with other evaluation modes.

Objectives:

1. To develop analytical skills for evaluating marketing performance using customer segmentation and campaign data.
2. To apply financial analytics techniques to enhance budgeting, forecasting, and investment decision-making.
3. To utilize HR analytics to interpret workforce trends and improve organizational decision-making.
4. To implement hospital data analytics for optimizing operations and improving patient care outcomes.
5. To analyse web data using metrics and tools to improve digital presence and user engagement.
6. To provide knowledge of key e-commerce analytics and their role in digital strategy.

Course Outcomes: On completion of this course, students will be able to:

1. Analyse and interpret marketing data for strategic decision-making and ROI evaluation.
2. Apply financial models and visualization tools to support financial planning and risk analysis.
3. Build HR dashboards and use predictive models to enhance workforce management.
4. Generate insights from hospital data to support strategic healthcare administration.
5. Track and evaluate web metrics to optimize digital content and user flow.
6. Use analytics to improve e-commerce performance.

Syllabus	Hours
Module 1: Marketing Analytics (Theory and Lab Exercise)	10

Meaning, characteristics, advantages and disadvantages of marketing analytics. Adoption and Application of Marketing Analytics. Customer Journey Mapping and the Process of Mapping (How to). Understanding the Metrics for Tracking Customer Experience - Customer Feedback Metrics & Behaviour Derived Customer Metrics. Introduction to Customer Lifetime Value (CLV). Basic formula of Customer Lifetime Value.

Lab Exercise: Summarizing Revenue Data: Month-wise and Product-wise. Slicing & Dicing of Data: Pareto Principle, Report Filters and Slicers. Demographic Analysis: Analyzing Sales Data by Age, Gender, Income and Location, Construction of Crosstabs of Two Demographic Variables. Using GETPIVOT Function for Pulling Data. Adding Data Labels and Data Tables. Compare the Sales Performance - ANOVA, MANOVA and Chi-Square

Module 2: Financial Analytics (Theory and Lab Exercise)	8
Definition and Scope of Financial Analytics. Key Components of Financial Analytics. Applications of Financial Analytics. Benefits of Financial Analytics. Challenges in Financial Analytics **Lab Exercise:** Excel functions for net present value (NPV), internal rate of return (IRR), and what-if scenarios. Use financial dashboards in Power BI or Tableau to track KPIs like profitability, liquidity, and operational efficiency.	
Module 3: Human Resource (HR) Analytics (Theory and Lab Exercise)	9
Importance and Scope of HR Analytics. Analytics for Key HR Processes - Recruitment and Hiring, Employee Performance Management, Employee Turnover and Retention, Compensation and Benefits, Employee Engagement and Satisfaction, Training and Development, Succession Planning, Talent Management. HR Analytics and Changing Role of HR Professionals **Lab Exercise:** Descriptive Analytics in HR: HR Dashboards using MS Excel, Slicing and Dicing of HR Data using MS Excel Pivot Table Applications, Data Visualization for Key HR processes.	
Module 4: Healthcare Analytics (Theory and Lab Exercise)	9
Introduction to Healthcare Analytics. Challenges in Healthcare Data Analysis. Healthcare Data Sources and Basic Analytics, Advanced Data Analytics for Healthcare, Applications and Practical Systems for Healthcare. Importance of data-driven strategies in operational efficiency and patient care in healthcare settings. Importance of analytics in strategic planning, resource optimization, and quality improvement in hospital administration. **Lab Exercise:** Use descriptive and predictive analytics to track infection control, emergency room wait times, and treatment outcomes. Visualize hospital metrics with dashboards and automate reporting using Excel and Power BI.	
Module 5: Web Analytics (Theory and Lab Exercise)	10
Web traffic data and digital strategy. Key web metrics- page views, bounce rates, session duration, click-through rate (CTR), and conversions. Usage of tools like Google Analytics and Tag Manager to track user behavior. Application of cohort analysis and funnel visualization to evaluate content and navigation paths. Analysis of A/B testing outcomes to optimize website elements for engagement and performance.	
Module 6: e-Commerce Analytics (Theory and Lab Exercise)	10
Introduction to e-Commerce. e-Commerce orders – Sales Revenue, Average order value (AOV), customer segmentation. Order to Analyse – Product performance, Return and Refund Rate, Customer lifetime value. Metrics and Key Performance Indicators – conversion rate, order frequency, Cart abandonment rate, Fulfilment Time, Customer review and rating. **Lab Exercise** : Visualizing, Dashboarding, and Reporting E-commerce Data and Analysis	
Reference: 1. Gupta, S., & Jathar, A. (2021). *Marketing analytics*. Wiley. 2. Winston, W. L. (2014). *Marketing analytics: Data driven techniques with Microsoft Excel*. Wiley.	

3. Hermann, C., & Burbary, K. (2018). *Digital marketing analytics* (2nd ed.). Que Publishing.
4. Maity, M., & Gurazada, P. (2021). *Marketing analytics for strategic decision making*. Oxford Higher Education.
5. Grigsby, M. (2015). *Marketing analytics: Strategic models and metrics*. Kogan Page.
6. Kozielski, R. (2018). *Measuring marketing analytics*. Emerald Publishing.
7. Hussain, J. (2022). *Financial analytics: The path to strategic value creation*. Wiley.
8. Rees, M. (2018). *Principles of financial modelling: Model design and best practices using Excel and VBA*. Wiley.
9. Subramanyam, K. R. (2014). *Financial statement analysis* (11th ed.). McGraw-Hill Education.
10. Bennett, M. J., & Hugen, D. L. (2016). *Financial analytics with R: Building a laptop laboratory for data science*. Cambridge University Press.
11. Yadav, R. S., & Maheshwari, S. (2021). *HR analytics*. Wiley.
12. Banerjee, P., Pandey, J., & Gupta, M. (2019). *HR analytics: Practical applications of HR analytics*. Sage.
13. Bhattacharya, D. K. (2017). *HR analytics*. Sage.
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