Maulana Abul Kalam Azad University of Technology, West Bengal
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Syllabus of BBA (Supply Chain Management)
Effective from academic session 2023-2024

Curriculum structure 7th and 8th Semester

Sem	Major (Offline)	Minor (Blended Mode) (Management)	Skill Enhancement (Online /Sessional)	Total Credits
VII	FY BSCM701 Digital Supply Chain and Industry 4.0 (5 credits) FY BSCM702 Supply Chain Analytics (5 credits) FY BBAGB703 Introduction to Research Methodology (4 Credits)	M10: Software Project Management / Introduction to Cyber Security and Cyber Laws/ Machine Learning with Python (4 credits) M11: Digital Marketing / Data Analysis and Interpretation/ Data Analysis & Reporting using SAS (4 credits)		22
VIII	FY BBAGB801 Sustainable Business and Project Finance (5 credits) FY BBAGB802 Advanced Business Research (5 credits)		FY BBAGB 881A: Capstone or FY BBAGB 881B: Research project 12 credits	22

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Semester VII

COURSE TITLE	**Digital Supply Chain and Industry 4.0**			**Credits**	**5**
Course Code	**FY BSCM701**	**Course Category**	**4 Yr UG**	**L-T-P**	**5:0:0**

	COURSE OUTCOMES	**BTL/Mapped Module**
1	Explain the fundamental concepts of digital supply chain transformation and Industry 4.0.	BTL 2/M1
2	Identify and describe key enabling technologies such as IoT, AI, blockchain, and digital twins in supply chain applications.	BTL 2/M2
3	Apply digital tools and frameworks to analyse supply chain processes such as procurement, production, and logistics.	BTL 3/ M3
4	Analyze the impact of digital transformation on supply chain performance, resilience, and sustainability.	BTL 4/M4
5	Evaluate strategic decisions in designing and managing digitally enabled global supply chain networks.	BTL 5/M5

Prerequisites: NIL

MODULE – 1: Evolution and foundations of digital supply chains	
Traditional supply chains; integrated supply chains; agile and lean supply chains; emergence of digital supply chains; drivers of digital transformation; benefits and challenges; digital supply chain framework; industry trends and future outlook.	12L
MODULE – 2: Digital transformation and strategic supply chain design	
Digital transformation in supply chains: concept and enablers; digital maturity models; digital business models; customer-centric supply chains Data-driven decision-making in supply networks; strategic role of digital integration; competitive advantage through digital supply chains.	12L
MODULE – 3: Industry 4.0 technologies in supply chains	
Overview of industry 4.0; internet of things (IoT) applications in supply chains; artificial intelligence and machine learning in operations Big data and cloud computing; blockchain for traceability and transparency; digital twins; cyber-physical systems; smart manufacturing and connected supply networks.	15L
MODULE – 4: Digital visibility and real-time supply chain information systems	
Role of real-time information in digital supply chains; data capture technologies (barcodes, QR codes, RFID); warehouse and logistics automation systems GPS-enabled tracking and visibility; control towers in supply chains; information flow integration across procurement, production, and distribution; role of ERP and cloud platforms in supply chain coordination.	15L
MODULE – 5: Digital decision support in operations (light analytics in SCM)	
Demand pattern visualization using digital tools; basic forecasting logic for operational planning; simple trend and seasonality identification; forecast accuracy concepts (basic error awareness only) Inventory visibility and classification through digital systems; EOQ	12L

and safety stock as decision rules enabled by digital data; supplier evaluation using digital scorecards; total cost of ownership (TCO) in digital procurement decisions.	
MODULE – 6: Digital logistics, distribution and supply network optimization	
Digital warehouse design and location intelligence (Center of gravity concept); smart warehousing and space utilization systems; transport mode selection supported by digital platforms; route optimization using digital tools Last-mile delivery systems in e-commerce and quick commerce; supply chain network visibility; role of platforms in logistics coordination; sustainability and efficiency in digital logistics systems.	9L
TOTAL	**75 Hrs**

TEXTBOOKS	
1.	Wang, Y. and Pettit, S., Digital Supply Chain Transformation: Emerging Technologies for Sustainable Growth, Ubiquity Press (Cardiff University Press), ISBN-13: 978-1911653349
2.	Gilchrist, A., Industry 4.0: The Industrial Internet of Things, Apress, ISBN-13: 978-1484220467
REFERENCE BOOK	
1.	Pettit, S. and Wang, Y., E-Logistics: Managing Your Digital Supply Chains for Competitive Advantage, Kogan Press, ISBN-13: 978-1789661194
2.	MacCarthy, B.L. and Ivanov, D., The Digital Supply Chain, Elsevier, ISBN-13: 978-0323916141
3.	Sahlot P., K.E.K. V, and Wankhere V. A., Industry 4.0 for Manufacturing Systems: Concepts, Technologies, and Applications, CRC Press, ISBN-13: 978-0323916141
4.	Mrugalska B., Karwowski W., and Ahram T.Z.,Industry 4.0 and Intelligent Manufacturing Technologies, Routledge, ISBN-13: 978-1040423301

Suggested schedule of sessions

Modules	**No. of sessions**	**Weightage (%)**
Evolution and foundations of digital supply chains	12	16%
Digital transformation and strategic supply chain design	12	16%
Industry 4.0 technologies in supply chains	15	20%
Digital visibility and real-time supply chain information systems	15	20%
Digital decision support in operations (light analytics in SCM)	12	16%
Digital logistics, distribution and supply network optimization	9	12%
Total	**75**	**100%**

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COURSE TITLE	**Supply Chain Analytics**			**Credits**	**5**
Course Code	**FY BSCM702**	**Course Category**	**4 Yr UG**	**L-T-P**	**5:0:0**

	COURSE OUTCOMES	**BTL/Mapped Module**
1	Explain the role of data, metrics, and performance measurement in supply chain decision-making.	BTL 2/M1
2	Apply basic forecasting, inventory, logistics, and procurement analytical techniques using spreadsheet tools.	BTL 3/M2
3	Analyze demand patterns, inventory requirements, logistics alternatives, and supplier performance using relevant supply chain data.	BTL 4/M3
4	Evaluate supply chain decisions using performance metrics, forecast accuracy measures, cost analyses, and supplier scorecards.	BTL 5/M4
5	Develop data-driven recommendations to improve efficiency, responsiveness, and effectiveness across supply chain operations.	BTL 6/M5

Prerequisites: NIL	
MODULE – 1: Introduction to supply chain analytics and performance measurement	
Supply chain flows: goods, information, and cash; role of data in supply chain decision-making; evolution from intuition-based to data-driven management; applications of analytics in supply chains Key performance indicators (KPIs); delivery performance metrics; order accuracy; customer return rates; introduction to the cash-to-cash cycle and working capital implications.	12L
MODULE – 2: Demand forecasting and forecast accuracy analysis	
Demand patterns and demand visualization; trends, seasonality, cyclical and random variations; forecasting concepts and applications; simple moving average (SMA); exponential smoothing Forecasting using Excel; forecast errors and their causes; mean absolute deviation (MAD); mean absolute percentage error (MAPE); improving forecast accuracy.	15L
MODULE – 3: Inventory analytics and stock control models	
Inventory costs and inventory performance; carrying costs and stockout costs; ABC inventory analysis; inventory classification using Excel; economic order quantity (EOQ); reorder decisions; safety stock concepts; buffer inventory calculations; balancing service levels and inventory investment.	15L
MODULE – 4: Logistics and distribution analytics	
Warehouse location decisions; center of gravity method; warehouse performance metrics; space utilization analysis; order picking efficiency Transport mode selection using cost-speed trade-offs; transportation cost analysis; routing fundamentals; delivery path optimization; logistics performance measurement.	15L
MODULE – 5: Procurement and sourcing analytics	
Supplier performance measurement; supplier evaluation criteria;	8L

weighted supplier scorecards; supplier ranking using Excel; procurement analytics; total cost of ownership (TCO); purchase price versus lifecycle cost; sourcing decision support.	
MODULE – 6: Technology-enabled supply chain analytics applications	
Data capture technologies in supply chains; barcodes; QR codes; RFID systems; logistics data generation and collection GPS-based tracking systems; real-time visibility in supply chains; e-commerce and quick-commerce delivery analytics; technology-enabled operational decision-making.	10L
TOTAL	**75 Hrs**

TEXTBOOKS	
1.	Vijayaraghavan, T.A.S., Supply Chain Analytics, Wiley India, ISBN-13: 978-9354243431
REFERENCE BOOK	
1.	Vandeput, N., Data Science for Supply Chain Forecasting, De Gruyter, Berlin, Germany, ISBN-13: 978-3110671100
2.	Banerjee, T., & Banerjee, A., Business Analytics: Text and Cases [with dedicated Supply Chain Operational Analytics modules], SAGE Publications India, New Delhi., ISBN-13: 978-9353287108

Suggested schedule of sessions

Modules	**No. of sessions**	**Weightage (%)**
Introduction to supply chain analytics and performance measurement	12	16%
Demand forecasting and forecast accuracy analysis	15	20%
Inventory analytics and stock control models	15	20%
Logistics and distribution analytics	15	20%
Procurement and sourcing analytics	8	10%
Technology-enabled supply chain analytics applications	10	14%
Total	**75**	**100%**

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Semester VII

COURSE TITLE	**Introduction to research methodology**			**Credits**	**5**
Course Code	**FY BFS703**	**Course Category**	**4 Yr UG**	**L-T-P**	**4:0:1**

	COURSE OUTCOMES	**BTL/Mapped Module**
1	Understand the fundamental concepts, purposes, and types of research and their applications across various disciplines	BTL 2/M1
2	Explain the stages of the research process, research ethics, and the role of literature review in developing research studies.	BTL 2/M2
3	Apply appropriate sampling techniques, data collection methods, and basic statistical tools to address research problems.	BTL 3/M3
4	Analyze research problems, scholarly literature, and collected data to establish relationships, patterns, and research gaps.	BTL 4/M4
5	Evaluate the suitability of research designs, methodologies, findings, and ethical considerations for different research contexts.	BTL 5/M5
6	Design and develop a research proposal by formulating research questions, objectives, hypotheses, methodology, and reporting procedures for a selected problem.	BTL 6/M6

Prerequisites: NIL	
MODULE – 1: Meaning, scope and significance of social research	
Types of Research: (a) Pure and Applied, (b) Exploratory, Descriptive, (c) Experimental; Steps in Social Research & types; Conceptualization and Formulation of Hypothesis.	7L
MODULE – 2: Research process and research design	
Meaning of research design, features of good design, Different research designs - Experimental and non-experimental designs, Cross-sectional and longitudinal studies, Case studies, Mixed-methods research, Important concepts related to research design Research problems, problem formulation, design structure and research process steps; Literature Review: Concept, necessity, research gap, reference, and plagiarism	8L
MODULE – 3: Data collection	
Sources and types of Data; Method of Data Collection - (a) Survey, (b) Observation, (c) Questionnaire & Scheduled, (d) Interview, (e) Case Study Questionnaire and Form Design - Techniques used in designing the Questionnaire, Questionnaire design and structure, Scales used in Questionnaires Measurement and Scaling - Types of measurement scale and their applicability, tests of measurement, scaling techniques.	15L
MODULE – 4: Sampling	
Sampling design, concept of sample and census survey; types of sampling, probabilistic and non-probabilistic sampling, sampling techniques; determination of sample size	15L
MODULE – 5: Data presentation and data analysis	
Graphical presentation of Data - Basic Tables, Charts and Diagrams for data presentation; frequency distribution	20L

Data Editing, Data Coding and Data Cleaning Descriptive statistics: Central Tendency, Dispersion, Skewness and Kurtosis, Introduction to Bi-variate techniques (Theory only)	
MODULE – 6: Reporting and report presentation	
Structure of Report – Content or report format – Basic presentation of text and style of reporting - Use of table /graph heading and subheading – Style of referencing used.	10L
TOTAL	**75 Hrs**

TEXTBOOKS	
1.	Kothari, C.R, Research Methodology – Methods and Techniques, NewAge International Ltd.
2.	Das, N. G., Statistical Methods, Tata McGrawHill
REFERENCE BOOK	
1.	U. Sekharan and R Bougie, Research Methods for Business, John Wiley and Sons
2.	D.R. Cooper and P.S. Schindler, Business Research Methods, Tata McGraw–Hill
3.	S. N. Murthy and U. Bhojanna, Business Research Methods, Excel Books
4.	J. K. Das, Business Mathematics and Statistics, Academic Publishers

Suggested schedule of sessions with tutorials

Modules	**No. of sessions**	**Weightage (%)**
Meaning, scope and significance of social research	7	10%
Research Process and Research Design	8	10%
Data Collection	15	20%
Sampling	15	20%
Data Presentation and Data Analysis	20	30%
Reporting and Report Presentation	10	10%
Total	**75**	**100%**

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Semester VIII

COURSE TITLE	**Sustainable Business and Project Finance**		**Credits**	**5**
Course Code	**FY BSCM801**	**Course Category**	**4 Yr UG**	**L-T-P**	**5:0:0**

	COURSE OUTCOMES	**BTL/Mapped Module**
1	Explain the concepts, principles, and frameworks of sustainable business, ESG management, and sustainable finance.	BTL 2/M1
2	Apply project appraisal techniques and sustainability principles in evaluating business and investment opportunities.	BTL 3/M2
3	Analyse sustainability challenges, project feasibility, financing alternatives, and project risks in business contexts.	BTL 4/M3
4	Evaluate investment and project decisions using financial, environmental, social, and governance criteria.	BTL 5/M4
5	Develop sustainable business and project financing recommendations that balance economic, environmental, and social objectives.	BTL 6/M5

Prerequisites: NIL	
MODULE – 1: Foundations of sustainable business and ESG management	
Concept of sustainability and sustainable development; triple bottom line approach; environmental, social and governance (ESG) principles Stakeholders and sustainability; sustainability challenges in business; corporate sustainability strategies; sustainability reporting; global sustainability frameworks and standards.	10L
MODULE – 2: Sustainable finance and responsible investment	
Concept and evolution of sustainable finance; responsible investment principles; ESG investing; green finance and climate finance Sustainable financial products; green bonds and social bonds; impact investing; role of financial institutions in promoting sustainability.	12L
MODULE – 3: Sustainable business practices and circular economy	
Sustainable operations management; sustainable supply chains; resource efficiency and waste reduction; circular economy concepts Renewable energy adoption; sustainable procurement practices; carbon footprint management; business models for sustainability.	14L
MODULE – 4: Introduction to project finance and project appraisal	
Nature and characteristics of projects; project life cycle; project identification and selection; feasibility studies; market feasibility; technical feasibility; financial feasibility Project costs and benefits; time value of money; project appraisal techniques including payback period, net present value (NPV), internal rate of return (IRR), and profitability index (PI).	15L
MODULE – 5: Project financing structure and risk management	
Sources of project finance; debt and equity financing; project capital structure; public-private partnerships (PPP); project cash flow analysis Project risk identification; financial risk, operational risk, market risk, and environmental risk; risk mitigation strategies; sensitivity and scenario analysis.	15L
MODULE – 5: Sustainable project finance and emerging trends	

Integration of ESG factors in project evaluation; financing renewable energy and infrastructure projects; green project finance; sustainable infrastructure development; climate-related financial risks; sustainable development goals (SDGs) and project investments Fintech and digital innovations in sustainable finance; future trends in sustainable business and project finance.	9L
TOTAL	**75 Hrs**

TEXTBOOKS	
1.	Ray, R., Sustainable Business Strategies (1st Edition), McGraw Hill Education (India) Pvt. Ltd., ISBN-13: 978-9364441674
2.	Yescombe, E.R., Principles of Project Finance (2nd Edition), Academic Pr, ISBN-13: 978-0123910585
REFERENCE BOOK	
1.	Srivastava, V. and Rajaraman, V., Project and Infrastructure Finance, Oxford University Press, ISBN-13: 978-9364441674
2.	Blackburn, W.R., The Sustainability Handbook: The Complete Management Guide to Achieving Social, Economic and Environmental Responsibility, Routledge, ISBN-13: 978-1634604543

Suggested schedule of sessions

Modules	**No. of sessions**	**Weightage (%)**
Foundations of sustainable business and ESG management	10	14%
Sustainable finance and responsible investment	12	16%
Sustainable business practices and the circular economy	14	18%
Introduction to project finance and project appraisal	15	20%
Project financing structure and risk management	15	20%
Sustainable project finance and emerging trends	9	12%
Total	**75**	**100%**

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Semester VIII

COURSE TITLE	**Advanced Business Research**			**Credits**	**5**
Course Code	**FY BFS802**	**Course Category**	**4 Yr UG**	**L-T-P**	**4:1:0**
	COURSE OUTCOMES			**BTL/Mapped Module**	
1	Understand the concepts, procedures, and assumptions of hypothesis testing, including parametric and non-parametric tests such as z-test, t-test, Chi-square, Mann–Whitney U test, and Kruskal–Wallis test along with interpretation of p-values and statistical significance.			BTL 2/M1	
2	Apply bivariate statistical techniques such as correlation, scatter diagrams, Karl Pearson's correlation, rank correlation, and regression analysis using Excel, SPSS, or Jamovi to analyze relationships between variables.			BTL 3/M2	
3	Analyze multivariate data using techniques such as multiple regression, partial correlation, ANOVA and interpret model diagnostics including R^2, adjusted R^2, multicollinearity, normality, and homoscedasticity.			BTL 4/M3	
4	Evaluate statistical models such as logistic regression and factor analysis by interpreting outputs, comparing models with linear regression, and assessing suitability using tests like Bartlett's test and exploratory factor analysis.			BTL 5/M4	
5	Develop and interpret data-driven research findings using statistical software (Excel/SPSS/Jamovi) by integrating hypothesis testing, regression analysis, ANOVA, logistic regression, and factor analysis for managerial decision-making			BTL 6/M5	
Prerequisites: NIL					
MODULE – 1: Hypothesis Testing					
Meaning, Procedure, Parametric tests of hypothesis (t test, z test), Nonparametric tests of hypothesis (Chi-square Test, Mann–Whitney U Test, Kruskal–Wallis Test), Errors (Type I & II), Significance levels & p-values				8L	
MODULE – 2: Bivariate Data Analysis					
Bivariate frequency distribution, Correlation Analysis, Correlation and Scatter Diagram – Karl Pearson's Correlation Coefficient – Rank Correlation – Correlation Coefficient for Bivariate Frequency Distribution, Regression Analysis using Excel/ SPSS/ Jamovi				12L	
MODULE – 3: Quantitative Research Methods					
Introduction to Multivariate Analysis - Assumptions of multivariate techniques, Multiple regression model concept and model specification, Multiple Correlation, Partial Correlation, Multicollinearity, Normality and homoscedasticity, Goodness of fit (R^2 and Adjusted R^2), Model diagnostics. ANOVA and MANOVA-Basic Principles, One-way ANOVA, Two-way ANOVA, Interaction effects, Post hoc tests Introduction to Logistic Regression - Concept, Logistic Regression vs Linear Regression, Model Building and Interpretation Introduction to Factor analysis, Barlett test, EFA and factor extraction				16L	

MODULE – 4: Technology, Innovation and Customer Relationship Management	
ANOVA and MANOVA - Basic Principles, One-way ANOVA, Two-way ANOVA, Interaction effects, Post hoc tests using Excel/ SPSS/ Jamovi Introduction to Logistic Regression - Concept, Logistic Regression vs Linear Regression, Model Building and Interpretation using Jamovi Introduction to Factor analysis, Barlett test, EFA and factor extraction using Jamovi	24L
Tutorial	**15L**
TOTAL	**75 Hrs**

TEXTBOOKS	
1.	Kothari, C.R., Research Methodology – Methods and Techniques, New Age International Ltd
2.	Scheffe, H., The Analysis of Variance, John Wiley
REFERENCE BOOK	
1.	Bhattacharya, G.K. & Johnson R.A., Concepts & Methods of Statistics, John Wiley
2.	D.R. Cooper and P.S. Schindler, Business Research Methods, Tata McGraw–Hill
3.	S. N. Murthy and U. Bhojanna, Business Research Methods, Excel Books
4.	Biswas, S., A Linear Model Approach to Regression Analysis and its Applications, New Central Book Agency

Suggested schedule of sessions with tutorials

Modules	**No. of sessions**	**Weightage (%)**
Hypothesis Testing	10	13%
Bivariate Data analysis	15	20%
Quantitative Research Methods	20	27%
Hands On Sessions using software	30	40%
Total	**75**	**100%**