

- Environmental Protection Agency (EPA, USA) – Sustainable Materials Management: The Road Ahead (Report)
- UNEP (United Nations Environment Programme) – Sustainable Resource Management: Global Trends and Practices

Teaching Pedagogy/Methodology:

- Lectures for conceptual foundations and theoretical frameworks.
- \Case Studies of companies practicing sustainable supply chain and materials management.
- Workshops/Practicals on eco-label evaluation and sustainable design strategies.
- Seminars and Group Discussions on emerging trends like Industry 5.0 and circular economy.
- Projects/Assignments involving real-world audits of green procurement and waste management systems.
- Industry Expert Talks/Webinars to give practical exposure.
- **SWAYAM Reference:** SWAYAM references for blended learning (as NEP 2020 recommends integrating online modules. Since SWAYAM directly doesn't have a course titled "Sustainable Materials Management", the closest and most relevant course available is:
- **SWAYAM:** Solid and Hazardous Waste Management - Institution: IIT Kharagpur, **Instructor:** Prof. Brajesh Kr. Dubey, **Course Focus:** Waste management, resource recovery, sustainable practices — all integral to Sustainable Materials Management.
- **Alternate useful SWAYAM course:** Introduction to Circular Economy, Institution: IIT Roorkee, Instructor: Prof. Gaurav Dixit, **Course Focus:** Circular economy frameworks that directly link to Unit III (Circular Economy and Resource Optimization).

Semester-VII

DISCIPLINE SPECIFIC ELECTIVE- DSE I- 7.1

Semester-VII

Business Research Methodology in Material Management

Offered by Commerce Department, College of Vocational Studies

Credit Distribution, Eligibility and Pre-requisites the Course

Course Title & Code	Total Credits	Lectures	Tutorial	Practical	Eligibility	Prerequisite of the course
Business Research Methodology in Material Management	4	3	1	-		

Learning Objectives:

- Understand various research methodologies applicable to material management.
- Formulate research problems and hypotheses.
- Design and conduct empirical research.
- Apply quantitative and qualitative methods to supply chain and material flow problems.
- Analyze data using relevant statistical tools.
- Interpret findings and develop actionable insights for material management decisions.

Learning Outcomes :

- By the end of this course, students will be able to:
- Explain the role of research in material management and its contribution to effective decision-making in inventory control, procurement, and logistics operations.
- Formulate clear and focused research problems relevant to material management, and develop appropriate research questions and hypotheses.
- Conduct thorough literature reviews to identify knowledge gaps and support research in the context of material handling, warehousing, and supply chain management.
- Design effective research methodologies (qualitative, quantitative, or mixed methods) tailored to investigate material management challenges.
- Select and apply appropriate data collection techniques, such as surveys, interviews, observations, and secondary data analysis, in the context of warehouse audits, supplier evaluations, and logistics performance studies.
- Employ statistical tools and software (e.g., Excel, SPSS, R) for data analysis and interpretation of findings related to forecasting, inventory performance, and material flow.
- Critically analyze research data to derive meaningful conclusions and recommendations for material management strategy and operations.
- Assess the reliability and validity of research instruments, ensuring the integrity and relevance of research findings in material management applications.
- Demonstrate ethical research practices in data collection, analysis, reporting, and stakeholder engagement.

Course Outline:

Units	Course Outline	
Unit-I	Introduction to Research in Material Management Role of research in logistics and material management Research process overview Types of research: basic vs. applied, quantitative vs. qualitative Case studies in material management research Importance of literature reviews Sources of literature: academic journals, industry reports Identifying research gaps Formulating research problems, objectives, and hypotheses	(10Hours)
Unit II	Research Design and Data Collection Methods	(11Hours)

	<p>Exploratory, descriptive, and causal research Cross-sectional vs. longitudinal studies Case study and action research methods Primary vs. secondary data Surveys, interviews, focus groups Observational methods in warehouses and inventory systems Best practices in instrument design (questionnaires, interview guides)</p>	
Unit III	<p>Sampling & Scaling Techniques</p> <p>Population and sample definitions Probability vs. non-probability sampling Sample size calculation Sampling in warehouse audits and vendor performance studies</p> <p>Variables and measurement scales Reliability and validity Likert scales, semantic differential scales Application to vendor evaluation, quality ratings</p>	(12Hours)
Unit IV	<p>Measures of central tendency and dispersion</p> <p>Data visualization techniques Use of Excel/SPSS for basic analysis Hypothesis testing, t-tests, ANOVA Correlation and regression analysis Applications in demand forecasting and inventory optimization Introduction to SPSS, R, Excel, NVivo (for qualitative data) Forecasting tools in material management (e.g., Arena, Minitab)</p>	(12 Hours)

Suggested Readings:

1. Cooper, D. R. & Schindler, P. S. (2017). Business Research Methods (12th ed.). McGraw-Hill.
2. Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2021). Business Research Methods (10th ed.). Cengage.
3. Kothari, C. R. (2014). Research Methodology: Methods and Techniques (3rd ed.). New Age International.
4. Saunders, M., Lewis, P., & Thornhill, A. (2019). Research Methods for Business Students (8th ed.). Pearson.
5. Uma Sekaran & Roger Bougie (2020). Research Methods for Business. Wiley.
6. Hair, J. F., et al. (2020). Essentials of Business Research Methods. Routledge.
7. Harvard Business Review (HBR) articles on applied research and HR analytics
8. SPSS User Manual and online tutorials.
9. YouTube Channels: Crash Course on Statistics, SPSS Tutorials, Excel Tips.

Other Suggestive Reading Materials/References:

1. Kothari, C.R. (2019). *Research Methodology: Methods and Techniques*. New Age International Publishers.
2. Sekaran, U., & Bougie, R. (2019). *Research Methods for Business: A Skill-Building Approach*. Wiley.
3. Cooper, D.R., & Schindler, P.S. (2014). *Business Research Methods*. McGraw-Hill.
4. Zikmund, W.G., Babin, B.J., Carr, J.C., & Griffin, M. (2013). *Business Research Methods*. Cengage Learning.
5. Malhotra, N.K. (2010). *Marketing Research: An Applied Orientation*. Pearson.
6. Bryman, A., & Bell, E. (2015). *Business Research Methods*. Oxford University Press.
7. Saunders, M., Lewis, P., & Thornhill, A. (2016). *Research Methods for Business Students*. Pearson.
8. Hair, J.F., Wolfinbarger, M., Money, A.H., Samouel, P., & Page, M. (2015). *Essentials of Business Research Methods*. Routledge.
9. Creswell, J.W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. SAGE Publications.
10. Flick, U. (2018). *An Introduction to Qualitative Research*. SAGE Publications.

Teaching Pedagogy/Methodology:

- **Lectures:** To introduce theoretical concepts and frameworks.
- **Case Studies:** Analysis of real-world business scenarios to apply research methods.
- **Workshops:** Hands-on sessions using digital tools like SPSS, Excel, and online survey platforms.
- **Group Discussions:** Collaborative exploration of research topics and methodologies.
- **Mini Project:** Conducting a primary research survey on an **SWAYAM Portal Reference: For a comprehensive course on Business Research Methods, refer to the SWAYAM portal: https://onlinecourses.swayam2.ac.in/cec20_mg14/preview**

Semester-VII

DISCIPLINE SPECIFIC ELECTIVE (DSE-I 7.2)

Strategic Procurement and Supplier Relationship Management

Offered by Commerce Department, College of Vocational Studies

Credit Distribution, Eligibility and Pre-requisites the Course

Course Title & Code	Total Credits	Lectures	Tutorial	Practical	Eligibility	Prerequisite of the course
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