



BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, Pilani
Hyderabad Campus

SECOND SEMESTER 2022-2023

Course Handout (Part II)

Date: 16/01/2023

In addition to part I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course Number : MF F422
Course Title : Supply Chain Modelling and Empirical Analysis
Instructor In-charge : PHANEENDRA KIRAN CHAGANTI

Course Description : Contexts, issues and challenges in supply chain modelling and empirical analysis, buyer-supplier relationship, cultural implications, Primary and secondary data collection, questionnaire design, Model development and analysis with Statistical Packages such as SMARTPLS3, SPSS, Hugin and AMOS, Value Stream Mapping, Life Cycle Modelling, Model development and analysis with OpenLCA and EVSM, cost benefit analysis, Digital supply chain and Performance modelling, case studies

1. Scope & Objectives of the Course:

The course provides students with the opportunity to get clarity and insight into the application of various supply chain modelling approaches and empirical analysis for evidence driven decision making in supply chain. The objectives of the course are:

- To introduce concept of decision making on the basis of multiple experts' opinion on various different supply chain problems, practices and strategies.
- To develop skill sets to analyze the qualitative data with a focus on empirical modelling for data driven decisions in supply chain.
- To develop model for life cycle analysis for measuring environmental sustainability in supply chain.
- To understand and analyse the various aspects of digital supply chain and its impact on supply chain performance.

2. Text Books:

Text Book 1: Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016), A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Sage publications.

Text Book 2: Bouchery, Yann, Charles J. Corbett, Jan C. Fransoo, and Tarkan Tan, eds. Sustainable supply chains: A research-based textbook on operations and strategy. Springer, 2016.

3. References:

[RB1] Hair Jr, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). Advanced Issues In Partial Least Squares Structural Equation Modeling. Sage publications.



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[RB2] Garson, G. D. (2016). Partial Least Squares: Regression and Structural Equation Models. Asheboro, NC: Statistical Associates Publishers .

4.Course Plan:

Lect. No.	Topic to be Covered	Learning Objectives	Chapter in the Text Book
1-2	Overview of supply chain modelling and empirical analysis	Contexts, issues and challenges in supply chain modelling and empirical analysis, Application in supply chain with a special focus on buyer-supplier relationship and cultural implications	T1+Research papers
3-5		Questionnaire development for experts' judgement/opinion, alternative analysis with multiple experts' opinion, cause-effect group classification, driver-dependency classification.	T1+Research papers
6-8		Two case studies on applications Multi-Attribute Decision Models in supply chain.	T1+Research papers
		Learning the model development using Multi-Attribute Decision Models	Laboratory class
9-16	Data Collection	Primary and secondary data, questionnaire design, sample size, data cleaning, Overview of Statistical Packages such as SMARTPLS3, SPSS, AMOS	T1+Research papers
		Learning the different concepts of model development using Statistical Packages such as SMARTPLS3, SPSS, AMOS	Laboratory class
17-23	Structural Equation Modeling	Measurement, Measurement Scales, Coding, Data Distributions, Structural Equation Modeling (SEM) with Partial Least Squares Path Modeling, Path Models with Latent Variables	T1+Research papers
		Case studies and Development of Structural Equation Model	Laboratory class
24-32	Modelling Heterogeneous Data	The Parametric Approach to PLS-Multi-Group Analysis (MGA); Measurement Invariance; Modeling Unobserved Heterogeneity; Continuous Moderator Effects	T1+Research papers
		Application of Modelling Heterogeneous Data in supply chain	Case Studies and Laboratory Class
33-37	Life Cycle Modelling	Overview of Life Cycle Assessment (LCA) and its application areas, Measuring Environmental	T2+Research papers



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		Impacts in Supply Chains, Primary and Secondary Data collection, Model Development and analysis	
		Life Cycle Assessment with model development and analysis	Case Studies and Laboratory Class
38-40	Digital supply chain and Performance modelling	Overview of Supply chain digitalization and its impact on supply chain performance, supply chain performance measures and performance measurement system, Supply chain performance assessment, Value Stream Mapping, Cost Benefit Analysis	Research Papers and Case Studies
		Recent case studies on digital supply chain, cost benefit analysis considering LCA	Case Studies and Laboratory Class

5. Evaluation Component

S. No.	Evaluation Component	Duration	Max. Marks	Date & Time	Nature
1	Mid-Semester Examination	90 Min	40 (20%)	13/03 9.30 - 11.00AM	CB/OB
2	Lab		40(20%)		OB
3	Project/Case Study /Article Presentations		40 (20%)		OB
4	Comprehensive Examination	180min	80 (40%)	08/05 FN	CB/OB

6. Chamber Consultation: To be announced in the class.

7. Notices: All notices concerning this course will be displayed on the CMS only.

8. Make-Up Policy: No students will be allowed to take make up without prior permission. For the case study and assignment / article/class presentation, no make ups will be granted.

9. Academic Honesty and Integrity Policy: *Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.*

Instructor -in - Charge



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