Institute of Business & Economic Research (IBER)

United International **University**

Institute of Business and Economic Research

UNITED INTERNATIONAL UNIVERSITY

Course outline for

PGD in Supply Chain Management (SCM)



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Institute of Business and Economic Research

UNITED INTERNATIONAL UNIVERSITY

Institute of Business and Economic Research (IBER)

Term – I (3 Courses)

Post Graduate Diploma in
Supply Chain Management (PGDSCM)

COURSE OUTLINE
Fundamentals of Supply Chain Management

PART A- INTRODUCTION

Course No. / Code : PGDSCM-101
Course Title : **Fundamentals of Supply Chain Management**
Course Instructor : Syeda Samira Sharmin
Adjunct Faculty, IBER, UIU
Senior General Manager, Sales & Marketing, Laser Treat

PART B - Module Structure
(10 Modules, 1 Mid-Term & 2 Final Examination)

Week	Topic(s)
Week 01	Introduction & Basics of Supply Chain Management
Week 02	Functions Involved in Supply Chain Management
Week 03	Basics of Procurement & Its Key Principles
Week 04	Procurement Functions & Purchasing
Week 05	Supplier Selection Process
Week 06	Negotiation
Week 07	Contract Management – Pros and Cons
Week 08	Customer Service in Supply Chain Management
Week 09	Outsourcing in Supply Chain Management
Week 10	Global Supply Chain

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PGD in Supply Chain Management

COURSE OUTLINE
Purchasing & Procurement Management

PART A- INTRODUCTION

Course No. / Code : PGDSCM-102
Course Title : **Purchasing & Procurement Management**
Course Instructor : Md. Sakif Bin Solaiman
Adjunct Faculty, IBER, UIU

PART B - COURSE CONTENT

Week	Topic(s)
Week 01	Introduction to Procurement
Week 02	Procurement Steps
Week 03	Sourcing Strategy
Week 04	Strategic Management of Obtaining Quotations
Week 05	Negotiation
Week 06	Foreign Procurement
Week 07	Landed Cost
Week 08	Contract Management
Week 09	Managing Purchasing & Supplier Relationships
Week 10	Presentations + Quiz
Week 11	Midterm Exam + Doubt-Clearing Session
Week 12	Semester Final

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PGD in Supply Chain Management

COURSE OUTLINE
Production and Operations Management

PART A- INTRODUCTION

Course No. / Course Code	: **PGDSCM 103**
Course Title	: **Production and Operations Management**
Course Instructor	:

Dr. Md Qamruzzaman
Professor, School of Business & Economics, UIU
Email: qamruzzaman@bus.uiu.ac.bd
Room# 315/B (Level 3)

Course Overview (What you'll master)

- Design and improve operations processes across manufacturing and services
- Plan capacity, match supply with demand, and reduce flow time/variability
- Manage projects in operations using CPM/PERT, crashing, and resource leveling
- Build and run quality systems (TQM/Lean/Six Sigma, SPC control charts)
- Forecast aggregate demand and translate it into SOP/aggregate plans
- Design inventory policies (EOQ, safety stock, reorder points, multi-echelon)

Course Learning Outcomes (CLOs)

1. Explain core operations strategies and their link to supply chain performance.
2. Map and analyze processes; quantify capacity, cycle time, WIP, and bottlenecks.
3. Plan and control projects using network methods; evaluate time-cost trade-offs.
4. Design quality systems using TQM principles, SPC, and continuous improvement.
5. Produce defendable aggregate demand forecasts and measure accuracy.
6. Select and tune inventory policies (deterministic stochastic) to target service levels.
7. Integrate forecasting, SOP, and inventory to support profitable execution.

Module Structure (6 Modules 2 Classes Each)

M1. Introduction to Operations SCM (Classes 1–2)
Focus: Role of operations in competitive strategy; process view; flow metrics.
Key topics: SCOR overview; process mapping (SIPOC, VSM); Little's Law; capacity bottlenecks; variability queues; lean principles (waste, pull, takt, kanban).
Hands-on: Map a local process; compute capacity CT; quick kaizen ideas.

M2. Fundamentals of Project Management for Operations (Classes 3–4)
Focus: Planning controlling improvement/launch projects.
Key topics: WBS; CPM/PERT; critical path slack; crashing; resource leveling; Gantt; Agile vs. waterfall in ops; stage-gate for NPI.
Hands-on: Build a project network; crash to a deadline; create a one-page project charter.

M3. Fundamentals of Quality Total Quality Management (Classes 5–6)
Focus: Designing quality into processes and culture.
Key topics: TQM principles; Cost of Quality; DMAIC; 7 QC tools; process capability (Cp/Cpk); control charts (X-bar, R, p, c); root cause (Ishikawa, 5-Whys).
Hands-on: Construct control charts from sample data; capability analysis; A3 report.

M4. Fundamentals of Inventory Management (Classes 7–8)
Focus: Why we hold inventory how it behaves.
Key topics: Inventory roles; ABC/XYZ; demand types; lead time variability; holding/shortage/ordering costs; EOQ extensions; service levels; fill rate vs. cycle service.
Hands-on: ABC classification; EOQ with sensitivity; safety stock intuition.

M5. Inventory Management Multi-Echelon Control (Classes 9–10)
Focus: Practical policies and network effects.
Key topics: Continuous review (Q,r); periodic review (P,S); safety stock under uncertainty; bullwhip effect mitigation; pooling; base-stock in multi-echelon; vendor-managed inventory (VMI).
Hands-on: Compute reorder points; simulate policy performance; set target service levels.

M6. Aggregate Demand Forecasting SOP (Classes 11–12)
Focus: From forecast to aggregate plan.
Key topics: Forecasting hierarchy (strategic operational); moving average, exponential smoothing (SES/Holt/Holt-Winters); MAPE/MAE/RMSE; bias; causal models; scenario planning; SOP aggregate planning (chase, level, hybrid).
Hands-on: Build forecasts in Excel; compare accuracy; draft a one-page SOP.

Capstone Project (Integrative)
Goal: For a local firm (manufacturing or service), build a mini-SOP that links forecasting □aggregate plan □Inventory policy with a quality/SPC element and a time-boxed improvement project plan.

Deliverables: (1) 8□lide executive brief; (2) Excel model (forecasts, plan, inventory policy); (3) 1-page SPC/A3 improvement.

Rubric highlights: Problem framing (15), analytical rigor (30), integration across modules (25), practicality cost/benefit (20), clarity (10).

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Institute of Business and Economic Research (IBER)
Term – II (3 Courses)

Post Graduate Diploma in
Supply Chain Management (PGDSCM)

COURSE OUTLINE
Logistics and Transport Management

PART A- INTRODUCTION

Course No. / Code : PGDSCM-201
Course Title : **Logistics and Transport Management**
Course Instructor : Mohammad Mamun Chowdhury
Adjunct Faculty, IBER, UIU
Head of Supply Chain, Rahimafrooz Storage Power

PART A- Course Content

Class / Week	Topic(s)
Class 1	Overview of Logistics and Transportation
Class 2	Designing a Distribution Network
Exam	**Quiz**
Class 3	Network Design in Supply Chain
Class 4	Designing Global Supply Chain Networks
Class 5	Managing Transportation in Supply Chain
Exam	**Mid-Term Exam**
Class 6	Transportation and Packaging
Class 7	International Logistics Terms and Practices (Part 1)
Class 8	International Logistics Terms and Practices (Part 2)
Class 9	3PL & Reverse Logistics
Class 10	Assignment Presentation
Exam	**Final Exam**

Post Graduate Diploma in
Supply Chain Management (PGDSCM)

COURSE OUTLINE
Inventory and Distribution Management

PART A- INTRODUCTION

Course No. / Code : PGDSCM-202
Course Title : **Inventory and Distribution Management**
Course Instructor : Syeda Samira Sharmin
Adjunct Faculty, IBER, UIU
Senior General Manager, Sales & Marketing, Laser Treat

PART B - Module Structure
(10 Modules, 1 Mid-Term & 2 Final Examination)

Week	Topic(s)
Week 01	Basics of Inventory and Distribution Management
Week 02	Where Inventory Management Takes Place & Key Terms
Week 03	Inventory Models & ABC Analysis
Week 04	Inventory Replenishment Strategy
Week 05	Collaborative Inventory Management
Week 06	Inventory Forecasting Techniques
Week 07	Inventory Policies in Modern Management
Week 08	Inventory Policies in Modern Management – Part 2
Week 09	Lean Inventory Management
Week 10	Sustainability in Inventory Management

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Post Graduate Diploma in Supply Chain Management (PGDSCM)

COURSE OUTLINE
Supply Chain Analytics

PART A- INTRODUCTION

Course No. / Course Code	: PGDSCM-203
Course Title	: Supply Chain Analytics
Course Instructor	: Dr. Md Qamruzzaman Professor, School of Business & Economics, UIU Email: qamruzzaman@bus.uiu.ac.bd Room#: 315/B (Level 3)

Course Objectives
The objective of this course is to equip PGD students with the analytics toolkit that turns supply-chain data into decisions. The course develops skills in data wrangling and visualization, demand forecasting, inventory and replenishment design under uncertainty, optimization for production, logistics and network design, and risk/sustainability analytics. By the end, students will be able to quantify trade-offs among cost, service, and risk and communicate actionable recommendations.

PART B-LEARNING RESOURCES
Required materials and handouts will be provided from time to time.

Reference books and resources
1) Chopra, S. & Meindl, P. (Latest ed.). Supply Chain Management: Strategy, Planning, and Operation. Pearson.
2) Simchi-Levi, D., Kaminsky, P., Simchi-Levi, E. (Latest ed.). Designing and Managing the Supply Chain. McGraw-Hill.
3) Silver, E., Pyke, D., Thomas, D. (Latest ed.). Inventory Management and Production Planning and Scheduling. Wiley.
4) Hyndman, R. & Athanasopoulos, G. Forecasting: Principles and Practice (FPP3). OTexts (open access).
5) Winston, W. Operations Research: Applications and Algorithms (or Practical Management Science). Cengage.
6) Selected articles, cases, and datasets provided by the instructor.

Software/Tools
Excel (Solver), Python (pandas, numpy, statsmodels, scikit-learn, PuLP or OR-Tools), optional: SQL (SQLite/BigQuery sandbox), Power BI/Tableau.

PART C: CONTENT OF THE COURSE

Modules at a glance (6 modules x 2 classes)
M1. Data Foundations & Descriptive Analytics for SCM
M2. Predictive Analytics & Demand Forecasting
M3. Inventory & Uncertainty Analytics
M4. Prescriptive Analytics: Optimization for Planning & Logistics
M5. Supply Network Variability & Bullwhip
M6. Risk, Sustainability & Decision Apps

CLASS-WISE BREAKDOWN

Module M1 — Data Foundations & Descriptive Analytics for SCM (Classes 1–2)
What you learn: SCM data models (orders, shipments, inventory, BOM, locations), data quality, joins & reshaping, KPI trees (OTIF, fill rate, forecast bias, ICC), SCOR metric mapping, best-practice visualization.
Key topics

- SQL for supply-chain tables; star schema vs. OLTP extracts
- Data cleaning, outlier checks, time-series indexing; reproducible notebooks
- KPI definition & diagnostic analytics (Pareto/ABC, cohort, contribution margins)
- Storytelling with dashboards (inventory turns, service level, OTIF, lead-time scatter)

Lab: Build a KPI dashboard (Python + Excel).
Mini-case: Diagnose service-level slippage with 3 months of DC data.

Module M2 — Predictive Analytics & Demand Forecasting (Classes 3–4)
What you learn: Select and evaluate forecasting models; detect bias/seasonality; incorporate causal drivers.
Key topics

- Forecasting workflow; train/validation/test, cross-validation for time series
- Moving average, SES, Holt/Holt-Winters; ARIMA/ARIMAX basics; feature engineering (events, promos, holidays); hierarchical & grouped forecasting; accuracy metrics (MAE, RMSE, MAPE, sMAPE) and bias
- When ML helps: regularized regression, gradient boosting for promo-lift

Lab: Compete two approaches (Holt-Winters vs. ARIMAX) on SKU-family data; compare MAPE and bias.

Mini-case: Executive brief recommending a forecasting method per demand class (A/B/C; smooth vs. intermittent).

(Built to mirror analytics & forecasting emphases seen in MITx and Rutgers materials.) edX+1

Module M3 — Inventory & Uncertainty Analytics (Classes 5–6)

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What you learn: Translate forecast error into safety stock and policy parameters; balance cost vs. service.

Key topics

- Demand/lead-time variability; service levels (cycle vs. fill rate); safety-stock math
- Policies: continuous review (Q,r)(Q,r)(Q,r), periodic (P,S)(P,S)(P,S); EOQ extensions, quantity discounts
- Newsvendor for single-period items; multi-item ABC/XYZ segmentation; intermittent demand (Croston/SBA, service-level tweaks)

Lab: Calibrate (Q,r)(Q,r)(Q,r) for target fill rates under variable lead time; stress-test with Monte Carlo.

Mini-case: Intermittent spare parts—choose policy & justify service-cost trade-offs.

Module M4 — Prescriptive Analytics: Optimization for Planning & Logistics (Classes 7–8)

What you learn: Formulate and solve LP/MIP models for production planning, transportation, and facility location.

Key topics

- LP building blocks (decision variables, objective, constraints); sensitivity analysis
- Production & capacity planning; S&OP alignment; transportation/assignment models
- Network design: p-median/facility location; intro to routing (VRP variants, heuristics)
- Solver ecosystem: Excel Solver vs. PuLP/OR-Tools; modeling tips

Lab: Build a production-distribution LP that trades off cost, capacity, and service; run scenarios.

Mini-case: Recommend a facility footprint change with quantified cost-to-serve impact. (Optimization focus aligns with prescriptive analytics strands in Georgia Tech SCL's certificate.) Supply Chain and Logistics Institute+1

Module M5 — Supply Network, Flow Variability & Bullwhip (Classes 9–10)

What you learn: Diagnose and mitigate variability propagation; design multi-echelon policies and buffers.

Key topics

- Lead-time decomposition; decoupling points; pooling & risk-sharing
- Bullwhip effect analytics and mitigation (information sharing, order smoothing, smaller lot sizes, shorter lead times)
- Multi-echelon inventory logic (base-stock, service allocation), VMI/consignment analytics
- Scenario analysis & what-if simulation for S&OP

Lab: Simulate a [illegible] echelon system; quantify bullwhip; test mitigation levers.

Mini-case: Set echelon service targets for a 3-node network and show working capital impact.

Module M6 — Risk, Sustainability & Decision Apps (Classes 11–12)

What you learn: Model uncertainty and resilience; build decision apps; embed ESG metrics.

Key topics

- Monte Carlo for supply risk; scenario stress testing; safety-capacity trade-offs
- ESG/Scope-3 aligned metrics (CO_2/ton-km, waste, defect ppm), supplier scorecards
- Price & promotion analytics basics (elasticity, cannibalization signals)
- Rapid decision apps: turn models into a user-facing tool (dashboard + solver)

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