



Indian Institute Of Technology
Roorkee (IIT Roorkee)

Executive Program in AI for E-Commerce and Quick Commerce

Type

Executive Program

Mode

Online

Duration

6 Months

Total fees

₹ 90,000

Indian Institute Of Technology Roorkee (IIT Roorkee)

The Executive Program in AI for E-Commerce & Quick Commerce by the Continuing Education Centre (CEC), IIT Roorkee equips professionals to understand how AI powers modern digital retail. With e-commerce platforms generating vast data, organisations rely on AI to drive efficiency, speed, and customer experience. This program covers key applications of machine learning, NLP, generative AI, and big data across search, recommendations, demand forecasting, pricing, and fraud detection. Through hands-on learning and real-world problem solving, participants learn to turn insights into action. Delivered via live online sessions and campus immersion, it enables professionals to bridge analytics with business execution.

Key features

- ◆ A Legacy of Excellence
- ◆ Academic Depth with Industry Relevance
- ◆ Programmes are designed to bridge theory with application, enabling professionals to apply learning directly in business and technology contexts.
- ◆ Learn from distinguished faculty recognised for their research, academic depth, and ability to translate complex concepts into practical insights.
- ◆ Future-Focused Curriculum

Executive Program in AI for E-Commerce and Quick Commerce

Highlights

- ◆ Build applied expertise in AI, machine learning, NLP, Generative AI and big data for digital commerce.
- ◆ Explore practical applications across recommendations, demand forecasting, pricing, fulfilment and fraud detection.
- ◆ Learn through real-world case studies from leading e-commerce and quick-commerce businesses.
- ◆ Gain hands-on exposure to tools such as Python, Power BI, Tableau, Elasticsearch and LLM-based systems.
- ◆ Participate in optional campus immersion opportunities and earn a certificate from CEC, IIT Roorkee.

Learning outcomes

- ◆ Apply AI and machine learning techniques to solve high-impact e-commerce and quick-commerce challenges.
- ◆ Design recommendation systems, demand-forecasting models and intelligent search solutions.
- ◆ Optimise pricing, inventory, fulfilment and last-mile operations using data-driven approaches.
- ◆ Analyse transaction, clickstream and customer-behaviour data to generate actionable insights.
- ◆ Translate AI outputs into clear business recommendations for product, marketing and operations teams.

Eligibility Criteria

Target Audience: Professionals currently working in or aspiring to enter the retail, e-commerce, or quick commerce sectors who wish to integrate AI into their operations.

Technical Background: Individuals with a foundational understanding of data analytics (e.g., proficiency in Excel) who are ready to transition to Python-based data science workflows.

Educational Level: Graduates or diploma holders seeking an executive-level understanding of how AI architectures drive modern digital commerce businesses.



Curriculum Overview (continued)

Module I: Foundations of AI & Data (18 subjects)

- ◆ AI Evolution: Traditional E-Commerce vs. AI-First & Q-Commerce
- ◆ Data Types I: Structured Data (Transactions Logistics Inventory)
- ◆ Data Types II: Unstructured Data (Clickstream Images Reviews)
- ◆ The Data Pipeline I: Data Flow from Clickstream to Order Management
- ◆ The Data Pipeline II: Integration with Logistics and Fulfilment Systems
- ◆ Case Study: Meesho – A Game-Changer in Indian E-Commerce
- ◆ Data Architecture: Introduction to Data Lakes and Warehouses
- ◆ Real-Time Pipelines: Streaming Data for Immediate Insights
- ◆ Data Capture: Implicit Signals (Dwell Time Heatmaps) vs. Explicit Ratings
- ◆ Identity Resolution: Stitching User Journeys Across Web App and Offline Channels
- ◆ Ecosystem Strategy: Platform-Based Growth and Diversification
- ◆ Case Study: Alibaba Group – Fostering an E-Commerce Ecosystem
- ◆ Python for Retail: Key Libraries (Pandas PySpark) for Commerce
- ◆ Q-Commerce Economics: Unit Economics Speed and Profitability Models
- ◆ Fulfilment Models: 10-Minute Delivery vs. Next-Day Delivery Logistics
- ◆ Governance: Handling PII GDPR and DPDP Compliance in Retail
- ◆ Case Study: Kent County Council – Implementing IT for E-Government
- ◆ Case Study: The Ultimate Bluff – Partygaming.com



Curriculum Overview (continued)

Module II: EDA & Visualization (24 subjects)

- ◆ Data Hygiene: Automated Cleaning of Catalogue Data (Missing Attributes)
- ◆ Outlier Detection I: Identifying Bulk Buyers and Resellers
- ◆ Outlier Detection II: Detecting Pricing Glitches and Anomalies
- ◆ Feature Engineering I: Creating Temporal Features (Days Since Last Purchase)
- ◆ Feature Engineering II: Behavioural Features (Average Basket Size Return Rate)
- ◆ Case Study: Data Modelling and Management for Big Data
- ◆ Segmentation Logic: Introduction to K-Means Clustering
- ◆ User Grouping: Implementing Segmentation on Transaction Data
- ◆ RFM Analysis I: Calculating Recency Frequency and Monetary Scores
- ◆ RFM Analysis II: Interpreting Scores for Marketing Action
- ◆ Cohort Analysis: Tracking Customer Retention Month-over-Month
- ◆ Case Study: DesiFirangi.com – Building a Niche E-Commerce Portal
- ◆ Geospatial Analytics I: Mapping Demand Density
- ◆ Geospatial Analytics II: Heatmaps for Dark Store Planning
- ◆ Dashboarding 101: Building a Command Centre in Power BI or Tableau
- ◆ Metric Tracking: Real-Time Monitoring of Order Volumes and Cancellations
- ◆ Sales Estimation: Applying Analytics to Predict Sales
- ◆ Case Study: E-Commerce Analytics for CPG Firms (A)
- ◆ Funnel Visualisation: Mapping View to Add-to-Cart to Checkout
- ◆ Drop-Off Analysis: Identifying Friction Points in the User Journey
- ◆ Cart Abandonment: Analytics for Recovery Strategies
- ◆ Advanced Storytelling: Visualising Conversion Rates Effectively
- ◆ Visualising Cohorts: Creating Heatmaps for Long-Term Retention
- ◆ Visualisation Project: Building the Executive Dashboard Prototype



Curriculum Overview (continued)

Campus Immersion 1 (7 subjects)

- ◆ Two-Day Campus Immersion at IIT Roorkee
- ◆ Faculty Sessions
- ◆ Industry Networking
- ◆ Executive Reporting: Automating Weekly Business Review Slides
- ◆ Workshop on Storytelling with Data
- ◆ Peer Group Assignments
- ◆ Question-and-Answer Session with Industry Mentors



Module 3: Rec Systems (18 subjects)

- ◆ Recommendation-System Fundamentals: Understanding the User-Item Matrix
- ◆ Sparsity Issues: Handling Missing Data in Large Catalogues
- ◆ Collaborative Filtering I: User-Based vs. Item-Based Approaches
- ◆ Collaborative Filtering II: Matrix Factorisation Techniques
- ◆ Content-Based Filtering: Using Metadata and Descriptions
- ◆ The Cold Start Problem: Handling New Users or Items with No History
- ◆ Hybrid Systems: Combining Behavioural Data with Product Metadata
- ◆ Context Awareness: Injecting Time Weather and Location Signals
- ◆ Session-Based Recommendations I: Handling Anonymous Users
- ◆ Session-Based Recommendations II: Real-Time Product Suggestions
- ◆ Architecture: Latency Requirements for Live Recommendations
- ◆ Real-World Examples: Analysing Recommendation-System Architectures in Action
- ◆ Upsell Strategy: Algorithms for Recommending Premium Versions
- ◆ Cross-Sell Strategy: Frequently Bought Together Affinity Mapping
- ◆ Evaluation Metrics I: Precision at K and Recall
- ◆ Evaluation Metrics II: Normalised Discounted Cumulative Gain
- ◆ Affinity Mapping: Association Rule Mining Logic
- ◆ Case Study: Housing.com – Disrupting the House Search Process



Curriculum Overview (continued)

Module 4: Forecasting & Ops (30 subjects)

- ◆ Time-Series Fundamentals: Decomposing Trend Seasonality and Noise
- ◆ Statistical Models: Implementation of ARIMA
- ◆ Prophet Model: Facebook Prophet for Retail Forecasting
- ◆ Event Modelling: Handling Shock Events (Flash Sales Rain)
- ◆ Baseline Metrics: Calculating MAPE and RMSE
- ◆ Case Study: The Internet of Things – Shaping the Future of E-Commerce
- ◆ Deep Learning: LSTMs for Non-Linear Demand Patterns
- ◆ Hyperlocal Demand: Predicting Demand by Pincode or Zone
- ◆ Spike Detection: Managing High-Velocity Order Influxes
- ◆ Platform Strategy: Curated vs. Open Marketplace Models
- ◆ Supply-Chain Statistics: Interpreting Optimisation Outputs
- ◆ Case Study: Pepperfry.com – Turning the Tables on Disruption
- ◆ Inventory Balancing: Inter-Store Stock Transfer Algorithms
- ◆ Perishability AI: Predicting Wastage for Fresh Grocery
- ◆ Replenishment Logic: Automated Reorder-Point Calculation
- ◆ Bullwhip Effect: Supply-Chain Dynamics in Perishables
- ◆ Case Study: Warehousing Enhancements for E-Commerce Growth
- ◆ Case Study: Easy Flower – Flowers Meet Business and Technology
- ◆ Route Optimisation: Solving Vehicle-Routing Problems
- ◆ ETA Prediction: Machine Learning for Accurate Delivery-Time Estimation
- ◆ Batching Logic: Combining Multiple Orders for Individual Riders
- ◆ Rider Allocation: Matching Supply to Demand Spikes
- ◆ Case Study: Improving Last-Mile Productivity at Paack
- ◆ Case Study: Snapdeal – A Nightmare or a Benefit in Reverse Logistics?
- ◆ Price Elasticity: Calculating Sensitivity to Price Changes
- ◆ Dynamic Pricing I: Rules-Based vs. AI-Based Strategies
- ◆ Dynamic Pricing II: Reinforcement Learning for Surge Pricing
- ◆ Markdown Optimisation: Optimal Discounting for Clearance
- ◆ Surge Logic: Algorithms Behind Peak-Hour Pricing
- ◆ Case Study: Lessons from More Than 1000 E-Commerce Pricing Tests



Curriculum Overview (continued)

Module 5: Customer Analytics (12 subjects)

- ◆ Customer Lifetime Value Basics
- ◆ Marketing-Mix Modelling: Budget Allocation Across Facebook and Google
- ◆ Attribution Modelling I: Last-Click vs. First-Click
- ◆ Attribution Modelling II: Algorithmic Attribution
- ◆ ROAS Optimisation: AI in Digital Advertising Optimisation
- ◆ Growth Strategy: Data-Led Growth in Competitive Markets
- ◆ Transaction Fraud: Detecting Stolen Cards and Payment Anomalies
- ◆ Abuse Detection: Identifying Wardrobing or Return Abuse
- ◆ Bot Detection: Stopping Promotional-Code Hunting Scripts
- ◆ Risk Pipelines: Real-Time Fraud-Detection Architectures
- ◆ Ethical Regulation: Regulatory Challenges in Internet Models
- ◆ Industry Example: PayPal and Stripe Real-Time Fraud Pipelines



Curriculum Overview (continued)

Module 6: GenAI & NLP (18 subjects)

- ◆ NLP Foundations: Tokenisation and Sentiment Analysis
- ◆ Entity Extraction: Extracting Brand and Size from Search
- ◆ Vector Databases: Introduction to Embeddings
- ◆ Semantic Search: Moving Beyond Keyword Matching
- ◆ Review Mining: Extracting Product Defects from User Feedback
- ◆ Case Study: Twiggie – E-Commerce with Semantic Search
- ◆ LLM Integration: Fine-Tuning Large Language Models for Commerce
- ◆ RAG Architecture I: Retrieval-Augmented Generation Basics
- ◆ RAG Architecture II: Chat with Catalogue Implementation
- ◆ Support Automation: Flows for Where Is My Order Tickets
- ◆ AI Agents: Deploying Autonomous Support Agents
- ◆ Industry Case: Klarna and Intercom AI Support Agents
- ◆ Content Factory: Generating Product Titles and Descriptions
- ◆ Visual AI: Automatically Tagging Product Images
- ◆ Multilingual AI: Real-Time Translation for Tier-2 and Tier-3 Markets
- ◆ Voice Commerce: Speech-to-Text for Mobile-First Users
- ◆ Generative Design: AI for Marketing Creatives
- ◆ Generative AI Ethics: Bias and Hallucination in Commerce



Curriculum Overview (continued)

Module 7: Capstone Project (12 subjects)

- ◆ Problem Selection: Choosing a Track (Recommendations Churn Pricing)
- ◆ Data Preparation I: Acquiring the Required Dataset
- ◆ Data Preparation II: Cleaning and Feature Engineering
- ◆ Metric Definition: Business KPIs vs. Model KPIs
- ◆ Execution Risk: Trade-Offs Between Speed and Stability
- ◆ Case Study: 24x7 at Full Speed – Accelerated Time to Market
- ◆ Baseline Modelling: Establishing a Dummy-Model Benchmark
- ◆ Advanced Modelling: Hyperparameter Tuning and Iteration
- ◆ Deployment I: Creating a Streamlit Dashboard or API
- ◆ Deployment II: Model Serving and Latency Optimisation
- ◆ Insight Generation: Translating Model Outputs into Business Slides
- ◆ Presentation Preparation: Structuring the Defence Story

Campus Immersion 2: Project Defense & Career Guidance (6 subjects)

- ◆ Final Capstone Defence: Project Presentations
- ◆ Peer Review and Feedback
- ◆ Career Guidance: Resume Reviews and AI Roles
- ◆ Strategic Scaling: Innovation in Emerging Markets
- ◆ Case Study: Building India's Leading E-Commerce Company – mjunction
- ◆ Certification and Programme Wrap-Up

Fee Structure

Fee heads	Year 1	Total
Program Fee	₹ 90,000	₹ 90,000
Total	₹ 90,000	₹ 90,000