Toronto AI School

Master Program in AI for FinTech & Financial Systems

Week 1 – Foundations of AI in Finance

Session	Topics Covered
Day 1 – FinTech Ecosystem	- Overview of FinTech industry - AI transformation in banking - Financial data types and sources - Financial regulations in North America - Digital banking architecture - Case Study: TD Bank digital transformation - Case Study: JPMorgan AI strategy
Day 2 – Financial Data Infrastructure	- Financial transaction data pipelines - Data warehousing for banking - Financial data governance - Risk data modeling - Real-time transaction processing - Case Study: Visa payment infrastructure - Case Study: Stripe financial data pipelines
Day 3 – AI Opportunities in Finance	- AI in trading systems - AI credit scoring systems - Fraud detection systems - AI for financial forecasting - AI robo-advisors - Case Study: Wealthfront robo-advisor - Case Study: PayPal fraud detection

Week 2 – Machine Learning for Finance

Session	Topics Covered
Day 1 – Financial Prediction Models	- Stock price prediction models - Market volatility prediction - Time series forecasting - Portfolio optimization models - Quantitative trading algorithms - Case Study: Renaissance Technologies trading AI - Case Study: Goldman Sachs predictive analytics
Day 2 – Credit Risk Modeling	- Loan risk prediction models - Customer credit scoring - Risk analytics pipelines - Default probability modeling - Financial risk dashboards - Case Study: FICO credit scoring systems - Case Study: LendingClub risk models

Day 3 – Fraud Detection AI	- Fraud detection machine learning - Transaction anomaly detection - Fraud risk scoring models - Financial cybersecurity analytics - Anti-money laundering systems - Case Study: Mastercard fraud detection AI - Case Study: American Express fraud analytics

Week 3 – Algorithmic Trading

Session	Topics Covered
Day 1 – Quantitative Trading Systems	- Trading algorithms fundamentals - Market microstructure - High-frequency trading systems - AI trading strategies - Backtesting trading models - Case Study: Citadel trading infrastructure - Case Study: Two Sigma quant models
Day 2 – Trading Data Pipelines	- Market data ingestion - Financial data streaming systems - Trading signal pipelines - Feature engineering for trading - Trading simulation environments - Case Study: NASDAQ trading infrastructure - Case Study: Bloomberg market data systems
Day 3 – Risk Management Systems	- Portfolio risk analytics - Value at Risk models - Stress testing models - Market risk dashboards - Trading compliance systems - Case Study: BlackRock risk platform - Case Study: hedge fund risk systems

Week 4 – AI in Banking

Session	Topics Covered
Day 1 – Digital Banking AI	- AI chatbots for banking - Customer support automation - Customer financial insights - Personal finance assistants - AI banking dashboards - Case Study: Bank of America Erica AI assistant - Case Study: HSBC digital banking AI
Day 2 – Loan Processing Automation	- AI loan underwriting systems - Mortgage risk models - Loan approval automation - Financial document analysis - Credit risk automation - Case Study: Rocket Mortgage automation - Case Study: FinTech loan platforms

Day 3 – Banking Analytics	- Customer lifetime value models - Customer segmentation AI - Cross-selling recommendation engines - Banking marketing analytics - Churn prediction models - Case Study: Capital One analytics systems - Case Study: Wells Fargo customer analytics

Week 5 – FinTech Infrastructure

Session	Topics Covered
Day 1 – Payment Systems	- Payment processing architecture - Digital wallet systems - Payment fraud detection - Financial APIs - Transaction security systems - Case Study: PayPal infrastructure - Case Study: Square payment systems
Day 2 – Blockchain & Crypto AI	- Blockchain fundamentals - Cryptocurrency analytics - AI for crypto trading - Smart contract analytics - Blockchain fraud detection - Case Study: Coinbase trading analytics - Case Study: Chainalysis crypto investigation
Day 3 – FinTech Platforms	- Financial SaaS platforms - Banking APIs - Open banking systems - FinTech platform architecture - Financial product innovation - Case Study: Plaid financial APIs - Case Study: Revolut FinTech platform

Week 6 – Financial NLP

Session	Topics Covered
Day 1 – Financial Document AI	- NLP for financial reports - Earnings report analysis - Financial document summarization - Risk disclosure analysis - Financial text classification - Case Study: Bloomberg NLP systems - Case Study: SEC filing analytics
Day 2 – Market Sentiment Analysis	- News sentiment analysis - Social media market sentiment - Investor sentiment analytics - Trading signals from news - Financial NLP pipelines - Case Study: hedge fund sentiment AI - Case Study: Twitter market sentiment models

Day 3 – AI Assistants for Finance	- AI financial advisors - Investment assistants - AI tax advisory systems - Financial research assistants - AI wealth management copilots - Case Study: Morgan Stanley AI advisors - Case Study: robo-advisor platforms

Week 7 – FinTech Security

Session	Topics Covered
Day 1 – Financial Cybersecurity	- Banking cybersecurity threats - Payment fraud protection - Secure financial infrastructure - Transaction monitoring systems - Security analytics for banks - Case Study: SWIFT banking cyber attack - Case Study: financial cybercrime investigation
Day 2 – Regulatory Compliance	- Financial regulations overview - Anti-money laundering compliance - KYC systems - Financial data governance - Compliance monitoring systems - Case Study: AML monitoring systems - Case Study: regulatory fintech compliance
Day 3 – Financial Risk Systems	- Operational risk analytics - Financial risk dashboards - Fraud investigation systems - Compliance automation - Enterprise risk analytics - Case Study: global bank risk systems - Case Study: FinTech compliance automation

Week 8 – AI Infrastructure for Finance

Session	Topics Covered
Day 1 – Cloud AI for Finance	- Cloud architecture for banks - Financial ML pipelines - Scalable AI infrastructure - Financial data security - Cloud-based analytics - Case Study: AWS banking platforms - Case Study: Google Cloud financial analytics
Day 2 – Real-Time Financial AI	- Real-time fraud detection - Streaming financial analytics - Transaction monitoring pipelines - Financial event processing - Low-latency AI systems - Case Study: Visa real-time fraud detection - Case Study: Mastercard AI payment monitoring

Day 3 – FinTech Data Platforms	- Financial data lakes - Enterprise financial analytics - Risk data warehouses - Financial reporting systems - AI financial dashboards - Case Study: Bloomberg data platforms - Case Study: Refinitiv financial analytics

Week 9 – AI Products for Finance

Session	Topics Covered
Day 1 – FinTech Product Design	- Designing FinTech AI products - AI financial SaaS platforms - Banking APIs - Financial data products - Investment analytics tools - Case Study: Robinhood trading platform - Case Study: Wealthsimple fintech platform
Day 2 – AI Startups in Finance	- FinTech startup ecosystems - AI financial innovation - Financial product-market fit - Building AI financial tools - FinTech venture landscape - Case Study: Stripe startup growth - Case Study: Klarna FinTech innovation
Day 3 – Financial Innovation	- Future of AI in finance - Decentralized finance systems - AI financial research - Next-generation banking platforms - Global FinTech trends - Case Study: digital bank evolution - Case Study: AI hedge fund platforms

Week 10 – Capstone FinTech AI Projects

Session	Topics Covered
Day 1 – Financial Prediction Systems	- Build stock prediction model - Develop trading signal system - Design portfolio optimization tool - Create financial dashboard - Deploy trading ML pipeline - Project: algorithmic trading AI - Project: financial risk prediction system
Day 2 – Fraud Detection Systems	- Build fraud detection AI - Create anomaly detection model - Develop transaction monitoring dashboard - Deploy fraud detection API - Integrate financial analytics - Project: payment fraud detection system - Project: AML monitoring platform

Day 3 – FinTech AI Startup	- Design FinTech SaaS product - Build financial analytics platform - Create AI investment advisor - Deploy cloud financial AI system - Present FinTech innovation project - Project: AI robo-advisor - Project: financial analytics SaaS