

**BACHELOR OF SCIENCE IN FINANCIAL TECHNOLOGY  
(BSFINTECH) (4 YEARS)  
134 CREDIT HOURS**

**Regulations Relating to the Degree of BS Financial Technology (FinTech)**

**a) Duration:**

The duration of the course for the Degree of **BS FinTech** shall not be less than **eight semesters** and not more than **twelve semesters**.

**b) Admission Eligibility Criteria:**

A candidate seeking admission to the BS FinTech program must fulfill the following requirement:

- i) A person holding **intermediate certificate, A-level or equivalent certificate** from any recognized institute with at least **50%** marks shall be eligible for admission to BS Fin tech program.
- ii) Admission will be on open merit basis; based on academic achievement in intermediate.
- iii) A candidate must not be more than 23 years of age on 1st October of the year of admission.

**c) Academic Standing / Passing Criteria**

**Grade Point Average:**

- Maximum Grade Point Average: **4.00**
- Minimum Grade Point Average for obtaining the BS FinTech degree: **2.50**

**(i) Minimum CGPA Requirement per Semester to Remain Enrolled:**

<b>Semester</b>	<b>Minimum CGPA</b>
1st	0.75
2nd	1.00
3rd	1.25
4 <sup>th</sup>	1.50
5 <sup>th</sup>	1.75
6 <sup>th</sup>	2.00
7 <sup>th</sup>	2.25
8 <sup>th</sup>	2.50

**Scheme of Study**  
**BACHELOR OF SCIENCE IN FINANCIAL TECHNOLOGY**  
**(BSFINTECH) (4 YEARS)**

SUMMARY	Cr. Hrs
General Courses	35
Allied/Interdisciplinary Courses	12
Disciplinary/Major Courses	83
Internship/Field Experience	03
Capstone Project	03
<b>Total</b>	<b>134</b>

**SEMESTER-I**

S. No	Course Code	Course Title	Credit Hours	Category	Remarks
1.	CSC-100	Application of Information and Communication Technologies (ICT)	3 (2-3)	General	Already Approved
2.	ENG-301	Functional English	3(3-0)	General	Already Approved
3.	IS-302	Islamic Studies/Ethics	2(2-0)	General	Already Approved
4.	SSH-303	Pakistan Studies	2(2-0)	General	Already Approved
5.	MGT-321	Fundamentals of Accounting	3(3-0)	Disciplinary	Already Approved
6.	MGT-411	Principles of Management	3(3-0)	Disciplinary	Already Approved
7.	FQ-301	Fehm e Quran-1	1(0-1)		Already Approved
<b>Total Credit Hours</b>			<b>17</b>		

**SEMESTER-II**

S. No	Course Code	Course Title	Credit Hours	Category	Remarks
1.	ENG-302	Expository Writing	3(3-0)	General	Already Approved
2.	SSH-302	Ideology and Constitution of Pakistan	2(2-0)	General	Already Approved
3.	SOS-302	Seerat Studies	2(2-0)	General	Already Approved
4.	MGT-391	Business Mathematics	3(3-0)	Allied	Already Approved
5.	ECON-302	Introduction to Microeconomics	3(3-0)	Allied	Already Approved Economics dept.
6.	MGT-322	Financial Accounting	3(3-0)	Disciplinary	Already Approved
7.	FQ-302	Fehm e Quran-II	1(0-1)		
<b>Total Credit Hours</b>			<b>17</b>		

### SEMESTER-III

S. No	Course Code	Course Title	Credit Hours	Category	Remarks
1.	MGT-424	Introduction to business finance	3(3-0)	Disciplinary	Already Approved
2.	MGT-351	Principles of Marketing	3(3-0)	Disciplinary	Already Approved
3.	SSH-301	Civics and Community Development	2(2-0)	General	Already Approved
4.	MGT-444	Digital Entrepreneurship	3(2-3)	General	Already Approved
5.	QR-401	Quantitative Reasoning-I	3(3-0)	General	Already Approved
6.	ECON-304	Introduction to Macroeconomics	3(3-0)	Allied	Already Approved Economics dept.
<b>Total Credit Hours</b>			<b>17</b>		

### SEMESTER-IV

S. No	Course Code	Course Title	Credit Hours	Category	Remarks
1.	MGT-525	Financial Management	3(3-0)	Disciplinary	Already Approved
2.	MGT-638	International Finance	3(3-0)	Disciplinary	Already Approved
3.	CSC-101	Programming fundamentals	4 (3-3)	Disciplinary	Already Approved IT department
4.	MGT-493	Business Research Methods	3(3-0)	Allied	Already Approved
5.	QR-402	Quantitative Reasoning-II	3(3-0)	General	Already Approved
6.	ANTH-401	Social Psychology	3(3-0)	General	Already Approved Anthropology
<b>Total Credit Hours</b>			<b>19</b>		

### SEMESTER-V

S. No	Course Code	Course Title	Credit Hours	Category	Remarks
1.	MGT-502	Principles of Auditing	3(3-0)	Disciplinary	Already Approved
2.	MGT-602	Business Taxation	3(3-0)	Disciplinary	Already Approved
3.	MGT-351	Principles of Marketing	3(3-0)	Disciplinary	Already Approved
4.	CSC-103	Database systems	4 (3-3)	Disciplinary	Already Approved IT department
5.	MGT-597	Financial Markets & Institutions	3(3-0)	Disciplinary	Already Approved
6.	TOQ-501	Translation of Quran	NC		Already Approved
<b>Total Credit Hours</b>			<b>16</b>		

### SEMESTER-VI

S. No	Course Code	Course Title	Credit Hours	Category	Remarks
1.	MGT-599	Financial Reporting	3(3-0)	Disciplinary	Already Approved
2.	FINT-501	Data structure & Algorithms in financial analysis	3(2-3)	Disciplinary	NEW
3.	MGT-631	Securities Analysis & Portfolio Management	3(3-0)	Disciplinary	Already Approved
4.	FINT-502	Artificial Intelligence in business decision	3(3-0)	Disciplinary	NEW
5.	FINT-503	Fintech and financial Transformation	3(3-0)	Disciplinary	NEW
<b>Total Credit Hours</b>			<b>15</b>		

### SEMESTER-VII

S. No	Course Code	Course Title	Credit Hours	Category	Remarks
1.	FINT-601	Block chain technology for business	3(3-0)	Disciplinary	NEW
2.	FINT-602	Business analytics	3(3-0)	Disciplinary	NEW
3.	MGT-512	Organizational Behavior	3(3-0)	Disciplinary	Already Approved
4.		ELECTIVE-I	3(3-0)	Disciplinary	NEW
5.		ELECTIVE-II	3(3-0)	Disciplinary	NEW
<b>Total Credit hours</b>			<b>15</b>		
6.	MGT-698	Internship	3(0-6)		Already Approved
<b>Total Credit Hours</b>			<b>18</b>		

### SEMESTER-VIII

S. No	Course Code	Course Title	Credit Hours	Category	Remarks
1.	MGT-632	Introduction to Financial Risk Management	3(3-0)	Disciplinary	Already Approved
2.	MGT - 606	Accounting information system	3(3-0)	Disciplinary	Already Approved
3.		ELECTIVE-III	3(3-0)	Disciplinary	NEW
4.		ELECTIVE-IV	3(3-0)	Disciplinary	NEW
<b>Total Credit hours</b>			<b>12</b>		
5.	MGT-699	Project	3(0-6)		Already Approved
<b>Total Credit Hours</b>			<b>15</b>		

## **Elective courses**

<b>Sr. No.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>	<b>Remarks</b>
1	FINT-611	Digital Derivatives & Fintech Advances	3(3-0)	New course
2	FINT-612	Financial Modeling & Simulations	3(3-0)	New course
3	FINT-613	Fintech-Enhanced Stock Trading	3(3-0)	New course
4	FINT-614	Fintech Startups and Entrepreneurship	3(3-0)	New course
5	FINT-621	Cryptography for Finance	3(3-0)	New course
6	FINT-622	Digital Banking	3(3-0)	New course
7	CSC-251	Web Technologies	3(2-3)	Already approved in UIIT
8	FINT-623	Machine Learning in Finance	3(3-0)	New course
9	FINT-624	Data Visualization	3(3-0)	New course
10	CSC-202	Information Security	3 (2-3)	Already approved in UIIT

## Outlines of New Core Courses

### **FINT-501: Data Structures & Algorithms in Financial Analysis**

**Course Description:** This course applies data structures and algorithms to financial analysis. Students learn to model, process, and interpret financial data efficiently using appropriate algorithmic approaches.

**Course Objectives:**

- Understand key data structures and their applications in finance.
- Implement algorithms for time-series and financial modeling.
- Use optimization techniques for financial decision-making.

**Learning Outcomes:**

- Represent financial problems using data structures.
- Apply searching, sorting, and traversal algorithms.
- Build efficient models for portfolio and risk analysis.

**Course Contents:**

- Basic Data Structures (Arrays, Lists, Stacks, Queues)
- Trees, Heaps, Hash Tables
- Searching and Sorting Algorithms
- Graphs and Applications in Financial Networks
- Time-Series Data Structures and Financial Indicators

**Recommended Books:**

- Gün, M., & Kartal, B. (Eds.). (2025). *Machine Learning in Finance: Trends, Developments and Business Practices in the Financial Sector*. Cham: Springer
- Cormen, T. H. et al. (2022). *Introduction to Algorithms* (4th ed.). MIT Press.
- Narasimhan, R. (2023). *Financial Statements and Analysis* (2nd ed.).

### **FINT-502: Artificial Intelligence in Business Decision**

**Course Description:**

This course explores how artificial intelligence (AI) is applied to enhance business decision-making. It focuses on data-driven strategies, AI tools, and intelligent systems that support strategic, tactical, and operational decisions.

**Course Objectives:**

- Introduce the fundamentals of artificial intelligence.
- Explore AI applications in various business functions.
- Enable students to use AI tools for better decision-making.
- Understand the ethical and managerial implications of AI.

**Learning Outcomes:**

- Explain basic AI concepts and technologies.
- Identify AI applications in marketing, finance, HR, and operations.
- Apply machine learning for predictive analysis.

- Evaluate the impact of AI on business decision processes.

### **Course Contents:**

- Introduction to Artificial Intelligence and Business Use-Cases
- Machine Learning and Decision-Making
- AI in Marketing and Customer Insights
- AI in Financial Forecasting and Risk Management
- Intelligent Systems in Human Resource Management
- AI in Supply Chain and Operations
- Natural Language Processing and Chatbots
- Decision Support Systems using AI
- Ethical, Legal, and Social Issues in AI
- Hands-on with AI Tools (e.g., Power BI, Python basics)

### **Recommended Books:**

- Constantiou, I., Joshi, M. P., & Stelmaszak, M. (Eds.). (2024). *Research handbook on artificial intelligence and decision making in organizations*. Edward Elgar Publishing
- Russell, S., & Norvig, P. (2021). *Artificial Intelligence: A Modern Approach*. Pearson.
- Sharda, R., Delen, D., & Turban, E. (2020). *Analytics, Data Science, and Artificial Intelligence: Systems for Decision Support*. Pearson.
- Alpaydin, E. (2021). *Introduction to Machine Learning*. MIT Press.

## **FINT-503 Fintech and Financial Transformation**

### **Course Description:**

This course explores the impact of financial technology (Fintech) on the financial services industry and examines transformative innovations like blockchain, robo-advisors, mobile payments, and digital banking.

### **Course Objectives:**

- Understand Fintech trends and innovations.
- Analyze digital disruption in financial systems.
- Evaluate regulatory challenges and transformations.

### **Learning Outcomes:**

- Describe Fintech ecosystem and technologies.
- Evaluate the impact of Fintech on traditional finance.
- Identify regulatory and ethical issues in digital finance.

### **Course Contents:**

- Introduction to Fintech and Digital Transformation
- Mobile Banking and Payment Systems
- Blockchain, Smart Contracts, and Cryptocurrencies
- Robo-Advisors and AI in Finance
- Fintech Regulation and Compliance

### **Recommended Books:**

- The Economics of FinTech: Understanding Digital Transformation in Financial Services  
*Publisher: MIT Press (2024)*
- Arner, D. (2020). The RegTech Book. Wiley.
- Schueffel, P. (2021). Fintech: A Research Framework.

## **FINT-601: Block chain Technology for Business**

### **Course Description:**

This course introduces blockchain technology with a focus on its real-world business applications. Students will learn about decentralized systems, smart contracts, and how blockchain can transform industries like finance, supply chain, and healthcare.

### **Course Objectives:**

- Understand the technical and conceptual foundation of blockchain.
- Explore blockchain applications across various sectors.
- Evaluate smart contracts and decentralized apps (DApps).
- Discuss security, privacy, and regulatory issues in blockchain.

### **Learning Outcomes:**

- Define blockchain and describe how it works.
- Compare traditional databases with decentralized ledgers.
- Design and evaluate use-cases involving smart contracts.
- Analyze risks and benefits of blockchain adoption.

### **Course Contents:**

- Blockchain Fundamentals and Distributed Ledger Concepts
- Hash Functions and Cryptographic Keys
- Bitcoin, Ethereum, and Public Blockchains
- Smart Contracts and Decentralized Applications (DApps)
- Blockchain in Financial Services
- Blockchain in Supply Chain Management
- Blockchain in Healthcare and Real Estate
- Initial Coin Offerings (ICOs) and Token Economy
- Blockchain Governance and Regulatory Landscape
- Emerging Trends: Web 3.0 and the Metaverse

### **Recommended Books:**

- Mougayar, W. (2023). *The Business Blockchain*. Wiley.
- Narayanan, A. et al. (2016). *Bitcoin and Cryptocurrency Technologies*. Princeton University Press.
- Drescher, D. (2017). *Blockchain Basics*. Apress.

## **FINT-602: Business Analytics**

### **Course Description:**

This course provides foundational knowledge in business analytics. It focuses on using data to gain insights, make informed decisions, and optimize business performance using tools such as Excel, Power BI, and basic statistics.

### **Course Objectives:**

- Understand data types and sources relevant to business analytics.
- Use statistical tools to interpret and visualize data.
- Apply predictive and prescriptive analytics techniques.
- Integrate business analytics into strategic planning.

### **Learning Outcomes:**

- Explain the role of business analytics in decision-making.
- Apply descriptive, predictive, and prescriptive analytics.
- Use visualization tools to represent data trends.
- Solve real-world problems using analytical methods.

### **Course Contents:**

- Introduction to Business Analytics and Data Types
- Data Collection, Cleaning, and Preprocessing
- Descriptive Statistics and Data Visualization
- Predictive Analytics: Regression and Classification
- Time Series Forecasting
- Prescriptive Analytics and Optimization Models
- Dashboards and Reporting Tools (Excel, Power BI)
- Analytics Applications in Marketing, Finance, and HR
- Ethics in Data Analytics
- Capstone Project: Real-Time Business Data Analysis

### **Recommended Books:**

- Sharda, R., Delen, D., & Turban, E. (2023). *Business Intelligence, Analytics, Data Science, and AI* (5th ed.). Pearson.
- Evans, J. R. (2021). *Business Analytics*. Pearson.
- Provost, F., & Fawcett, T. (2013). *Data Science for Business*. O'Reilly Media.

## **Outlines of New Elective Courses**

### **FINT-611: Digital Derivatives & Fintech Advances**

#### **Course Description:**

This course explores the evolving landscape of derivatives in the digital era, covering innovations such as cryptocurrency derivatives, decentralized finance (DeFi), and algorithmic trading platforms. It focuses on the impact of fintech on traditional derivative instruments and risk management practices.

#### **Course Objectives:**

- Understand the structure and pricing of digital derivatives.
- Explore the role of fintech in transforming derivatives markets.
- Analyze the use of blockchain and smart contracts in derivatives.
- Examine regulatory and risk management considerations in digital derivatives.

#### **Learning Outcomes:**

- Define and classify various digital derivatives.
- Apply pricing models for cryptocurrency and tokenized assets.
- Evaluate platforms offering derivative trading (e.g., Binance, Uniswap).
- Assess fintech innovations and regulatory challenges in the derivatives market.

#### **Course Contents:**

- Introduction to Derivatives: Futures, Options, and Swaps
- Digital Assets and the Rise of Crypto Derivatives
- Blockchain Technology in Derivative Contracts
- Smart Contracts and Decentralized Derivative Platforms
- Risk Management in Crypto Derivative Trading
- Algorithmic Trading and High-Frequency Trading in Derivatives
- Stablecoins and Synthetic Assets
- Regulatory Landscape for Digital Derivatives
- Comparative Analysis: Traditional vs. Digital Derivatives
- Case Study: Derivatives on Ethereum, Bitcoin, and DeFi Protocols

#### **Recommended Books:**

- Machine Learning in Finance: Trends, Developments and Business Practices in the Financial Sector (2025)
- Hull, J. C. (2021). *Options, Futures, and Other Derivatives*. Pearson.
- Schär, F. (2021). *Decentralized Finance: On Blockchain- and Smart Contract-Based Financial Markets*. Federal Reserve Bank of St. Louis Review.
- Narayanan, A. et al. (2016). *Bitcoin and Cryptocurrency Technologies*. Princeton University Press.

## **FINT-612: Financial Modeling & Simulations**

### **Course Description:**

This course develops financial modeling skills using Excel, Python, or other relevant tools. It emphasizes building models for valuation, forecasting, and scenario analysis, incorporating Monte Carlo simulations and sensitivity testing.

### **Course Objectives:**

- Develop spreadsheet modeling techniques for financial analysis.
- Simulate real-world financial scenarios and assess risk.
- Enhance decision-making using data-driven financial models.
- Integrate financial theories into dynamic models.

### **Learning Outcomes:**

- Construct financial statements and valuation models.
- Perform forecasting, budgeting, and ratio analysis.
- Apply Monte Carlo simulation and scenario analysis.
- Use Excel/Python for financial data analysis.

### **Course Contents:**

- Basics of Financial Modeling and Spreadsheet Design
- Building Integrated Financial Statements
- Valuation Techniques: DCF, Multiples, and NPV
- Forecasting Sales, Costs, and Cash Flows
- Sensitivity and Scenario Analysis
- Monte Carlo Simulation for Financial Risk
- Modeling Capital Budgeting and Investment Appraisal
- Python for Financial Simulations (Introductory Level)
- Case Study: M&A or Startup Valuation Model
- Final Project: Comprehensive Financial Model

### **Recommended Books:**

- Financial Modeling in Practice: A Concise Guide for Intermediate and Advanced Level by Michael Rees
- Benninga, S. (2014). *Financial Modeling*. MIT Press.
- Tjia, J. (2018). *Building Financial Models*. McGraw-Hill Education.
- Day, K. (2022). *Python for Finance*. Packt Publishing.

## **FINT-613: Fintech-Enhanced Stock Trading**

### **Course Description:**

This course examines the influence of fintech on modern stock trading, including algorithmic trading, robo-advisory platforms, and AI-based trading strategies. It explores how technology is reshaping investor behavior, market efficiency, and trading strategies.

### **Course Objectives:**

- Understand fintech innovations in stock trading.
- Analyze algorithmic and high-frequency trading techniques.
- Evaluate the performance of AI-enhanced trading models.
- Explore regulatory and ethical concerns in automated trading.

### **Learning Outcomes:**

- Describe the evolution of fintech in stock markets.
- Build and back-test trading strategies using algorithms.
- Interpret market data using technical and quantitative tools.
- Understand the role of robo-advisors and mobile trading apps.

### **Course Contents:**

- Introduction to Fintech in Capital Markets
- Overview of Electronic and Algorithmic Trading
- Technical Indicators and Quantitative Strategies
- High-Frequency Trading and Market Microstructure
- Machine Learning in Stock Price Prediction
- Backtesting Strategies Using Python or TradingView
- Robo-Advisors and Personalized Investment Platforms
- Social Trading and Behavioral Finance Insights
- Ethics and Regulation in Algorithmic Trading
- Final Project: Strategy Design and Performance Analysis

### **Recommended Books:**

- FinTech Strategy: Linking Entrepreneurship, Finance, and Technology (2019)
- Algorithmic Trading and DMA: An Introduction to Direct Access Trading Strategies" by Barry Johnson
- Chan, E. (2017). *Algorithmic Trading: Winning Strategies and Their Rationale*. Wiley.
- Patel, Y. (2021). *Fintech Trading Strategies*. Independently Published.
- Narang, R. (2014). *Inside the Black Box: A Simple Guide to Quantitative and High-Frequency Trading*. Wiley

## **FINT-614: Fintech Startups and Entrepreneurship**

### **Course Description:**

This course focuses on the innovation and startup ecosystem within the fintech industry. It explores how entrepreneurs identify opportunities, design fintech business models, and navigate the regulatory, technical, and financial challenges of launching a fintech startup.

### **Course Objectives:**

- Understand the fintech startup ecosystem.
- Analyze key success factors and challenges for fintech ventures.
- Develop viable fintech business models.
- Explore funding, pitching, and scaling strategies for startups.

### **Learning Outcomes:**

- Identify gaps in financial services that can be solved with technology.
- Design and evaluate fintech business models.
- Pitch fintech startup ideas and build go-to-market strategies.
- Understand regulatory and investment aspects of fintech entrepreneurship.

### **Course Contents:**

- Introduction to Fintech Innovation and Disruption
- Fintech Market Trends and Opportunity Mapping
- Lean Startup Methodology and MVP Design
- Fintech Business Models (B2B, B2C, B2B2C)
- Regulatory Compliance and Risk in Startups
- Fundraising: Angel Investors, VCs, and Crowdfunding
- Building Teams and Scaling Fintech Startups
- Fintech Product Development and UX Design
- Legal and Ethical Issues in Fintech Startups
- Case Studies: Stripe, Robinhood, Revolut, and local fintechs

### **Recommended Books:**

- Arner, D. et al. (2020). *The Rise of FinTech: Risks and Regulatory Challenges*. Oxford.
- Fintech Founders: Inspiring Tales from the Entrepreneurs Who Are Changing Finance by Agustín Rubini (2019)
- Maurya, A. (2012). *Running Lean*. O'Reilly Media.
- Kumar, A. (2022). *Fintech Founders: Inspiring Tales from the Entrepreneurs Who Are Changing Finance*. Wiley.

## **FINT-621: Cryptography for Finance**

### **Course Description:**

This course introduces cryptographic principles and how they are applied in financial systems for secure transactions, authentication, privacy, and blockchain technology. It bridges the technical and applied aspects of cryptography in the financial domain.

### **Course Objectives:**

- Introduce core cryptographic techniques used in finance.
- Explain the role of cryptography in secure digital payments and blockchain.
- Explore encryption, hashing, and digital signatures.
- Analyze real-world cryptographic protocols in fintech applications.

### **Learning Outcomes:**

- Understand symmetric and asymmetric encryption.
- Apply cryptographic methods to financial systems and digital wallets.
- Explain how cryptography ensures blockchain security.
- Evaluate cybersecurity threats in fintech and crypto environments.

### **Course Contents:**

- Basics of Cryptography: Terminology and History
- Symmetric and Asymmetric Encryption
- Public Key Infrastructure (PKI) and Certificates
- Hashing and Secure Hash Algorithms (SHA)
- Digital Signatures and Authentication
- Cryptography in Blockchain and Smart Contracts
- Cryptographic Protocols in Banking & Payments
- Zero-Knowledge Proofs and Advanced Topics
- Cybersecurity in Financial Applications
- Practical Demos: Encryption Tools and Wallet Security

### **Recommended Books:**

- "Cryptography: Theory and Practice" by Douglas R. Stinson and Maura B. Paterson (2018)
- Paar, C., & Pelzl, J. (2010). *Understanding Cryptography*. Springer.
- Ferguson, N., & Schneier, B. (2011). *Cryptography Engineering*. Wiley.
- Bonneau, J. et al. (2016). *Bitcoin and Cryptocurrency Technologies*. Princeton University Press.

## **FINT-622: Digital Banking**

### **Course Description:**

This course provides an in-depth understanding of the digital transformation in banking. It covers neobanking, open banking, mobile payment systems, and how technologies such as AI and APIs are reshaping banking services and customer experiences.

### **Course Objectives:**

- Examine digital trends shaping the banking sector.
- Analyze the architecture and operations of digital banks.
- Understand the role of fintech in redefining customer-centric banking.
- Explore the regulatory, risk, and cybersecurity dimensions of digital banking.

### **Learning Outcomes:**

- Compare traditional vs. digital banking models.
- Understand the use of APIs, AI, and cloud in banking operations.
- Evaluate customer experience strategies in digital banking.
- Analyze risks, compliance, and cybersecurity in digital banks.

### **Course Contents:**

- Overview of Digital Banking Transformation
- Architecture of Neobanks and Challenger Banks
- Mobile Banking and Payment Ecosystems
- Open Banking & API Integration
- AI, Chatbots, and Personalized Banking Services

- KYC, AML, and Regulatory Compliance in Digital Banking
- Risk Management and Cybersecurity in Digital Banks
- Cloud Infrastructure and Scalability in Banking
- Customer Experience and Digital Onboarding
- Case Studies: N26, Monzo, Chime, and Pakistani Digital Banking Initiatives

### **Recommended Books:**

- Digital Bank: Strategies to Launch or Become a Digital Bank" by Chris Skinner (2023)
- King, B. (2018). *Bank 4.0: Banking Everywhere, Never at a Bank*. Wiley.
- Kotecha, H. (2020). *Digital Bank: Strategies to Launch or Become a Digital Bank*. Independently published.
- McKinsey Reports & World Bank Digital Finance Insights.

## **FINT-623: Machine Learning in Finance**

### **Course Description:**

This course explores the application of machine learning algorithms in the financial industry. It covers topics such as stock price prediction, risk modeling, fraud detection, and customer behavior analysis using supervised and unsupervised learning techniques.

### **Course Objectives:**

- Understand machine learning concepts and algorithms used in finance.
- Apply supervised and unsupervised learning techniques to financial data.
- Use machine learning models to predict stock prices, detect fraud, and manage risk.
- Implement machine learning algorithms using Python or R.

### **Learning Outcomes:**

- Develop machine learning models for financial applications.
- Analyze financial data using regression, classification, and clustering algorithms.
- Implement predictive analytics for stock and asset price forecasting.
- Evaluate and improve machine learning models for financial accuracy.

### **Course Contents:**

- Introduction to Machine Learning and Financial Applications
- Supervised Learning: Linear Regression, Logistic Regression
- Unsupervised Learning: Clustering, Principal Component Analysis
- Time Series Forecasting for Financial Data
- Neural Networks and Deep Learning for Finance
- Fraud Detection and Anomaly Detection with ML
- Risk Assessment Models and Credit Scoring
- Machine Learning for Portfolio Management
- Backtesting Machine Learning Models
- Ethics and Bias in Financial Machine Learning

### **Recommended Books:**

- Machine Learning in Finance: From Theory to Practice" by Matthew Dixon, Igor Halperin, and Paul Bilokon (2023)
- He, K., & Wu, J. (2020). *Machine Learning for Financial Engineering*. Springer.
- Tsay, R. (2018). *Analysis of Financial Statements and Machine Learning*. Wiley.
- Shmueli, G., & Bruce, P. (2017). *Data Mining for Business Analytics*. Wiley.

## **FINT-624: Data Visualization**

### **Course Description:**

This course covers the principles of effective data visualization and the tools used to present data insights clearly. It includes creating visualizations for various data types, interactive dashboards, and using tools like Tableau, Power BI, and Python libraries (e.g., Matplotlib, Seaborn).

### **Course Objectives:**

- Understand the theory behind effective data visualization.
- Learn to create insightful charts and graphs.
- Use modern visualization tools to create interactive reports.
- Develop the ability to present complex data in a simple and accessible format.

### **Learning Outcomes:**

- Design and create clear, informative visualizations of complex data.
- Use tools like Tableau, Power BI, and Python libraries to develop visual dashboards.
- Understand how different types of charts are used for different data sets.
- Communicate data insights effectively to non-technical stakeholders.

### **Course Contents:**

- Introduction to Data Visualization Principles
- Understanding Data Types and Visualization Techniques
- Creating Static Visualizations: Charts, Graphs, and Maps
- Interactive Dashboards and Visualizations with Tableau or Power BI
- Data Cleaning and Transformation for Visualization
- Data Storytelling and Communicating Insights
- Advanced Visualizations: Heatmaps, Treemaps, and Sankey Diagrams
- Visualization for Business Intelligence
- Case Study: Financial, Marketing, and Healthcare Dashboards
- Ethics in Data Visualization

### **Recommended Books:**

- Interactive Data Visualization for the Web by Scott Murray (2017)
- Knaflic, C. (2015). *Storytelling with Data: A Data Visualization Guide for Business Professionals*. Wiley.
- Cairo, A. (2016). *The Functional Art: An Introduction to Information Graphics and Visualization*. Pearson.
- Murray, S. (2016). *Interactive Data Visualization for the Web*. O'Reilly Media.