



**College of Humanities
Master of Financial
Technology-
Fin Tech**

**Artificial Intelligence for
Financial Technology**
FNT 626

Lecture 0

**Prepared By:
Dr. Abeir Moussa**



Artificial Intelligence for Financial Technology
FNT 626- AI for Fin Tech

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Introduction to The Program



Master of Financial Technology- Fin Tech

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Introduction to The Program

Master of Financial Technology – Fin Tech

The Master of Financial Technology focuses on developing Fin Tech services. The program emphasizes the systematic understanding of new digital models in financial services, how technology and innovation are changing financial practices, quantitative finance skills, and applying technologies to financial services.

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Introduction to The Program Cont.

Program Learning Outcomes:

- Implement different financial technologies using advanced algorithms with a clear understanding of software and hardware architectures.
- Use statistical and quantitative analysis and predictive and exploratory models to make financial decisions.
- Conceptualize, analyze, design, and implement digital services for building Fin Tech applications.
- Analysis, design, and implement artificial intelligence systems, including biometrics, prediction systems, and object recognition.

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Introduction to The Program Cont.

- **Teaching Methodology:**

The program courses are delivered online and the concepts of courses will be delivered using a combination of lectures, discussions, and dialogue around cases. Each course's main material and reference will be the suggested textbooks and related materials. Live discussions and slides are additional resources that are prepared by the professor.

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Introduction to The Program Cont.

- **Program Study Plan**

3 semesters (one academic year), 30 credit hours of credit toward graduation as follow;



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Introduction to The Program Cont.

Course	Credit Hours
<u>1st Term</u>	
FNT611 Foundations of Fin Tech	3 Hours
FNT613 Business Analysis	3 Hours
FNT615 Finance Concepts	3 Hours
<u>2nd Term</u>	
FNT622 Database Design	3 Hours
FNT625 Cybersecurity Concepts	3 Hours
FNT626 Artificial Intelligence for Fin Tech	3 Hours
FNT628 Cryptocurrencies	3 Hours
<u>3rd Term</u>	
FNT631 Data Analytics	3 Hours
FNT633 Machine Learning in Finance	3 Hours
MGM510 Risk Management	3 Hours



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Introduction to The Program Cont.

Study Plan	
<u>Week</u>	<u>Topic</u>
Week 1	Orientation lecture
Week 2	Lecture, Discussion, Quiz
Week 3	Lecture, Discussion, Quiz
Week 4	Lecture, Discussion, Quiz
Week 5	Lecture, Discussion, Quiz The last date for withdrawal the course or the semester
Week 6	Lecture, Discussion, Quiz
Week 7	Lecture, Discussion, Quiz
Week 8	Lecture, Discussion, Quiz
Week 9	Lecture, Discussion, Quiz
Week 10	Lecture, Discussion, Quiz
Week 11	Lecture, Discussion, Quiz
Week 12	Discussion
Week 13	Final Exam

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Introduction to The Program Cont.

- **Language of Study**

The study will be delivered in English. However, explanations will be provided in both English and Arabic

General Information

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- **Course Credit Hours: 3 credit hours**

The main textbook and other related material that will be used as a reference for the course is mentioned in the course syllabus. Additionally, some additional resources; lecture notes and slides will be prepared by the professor and provided for the students on the model.

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- **Course Description**

This course is designed to provide a comprehensive understanding of the applications, challenges, and opportunities of artificial intelligence (AI) in the financial sector. The course will explore how AI technologies are transforming various aspects of the financial industry, including banking, insurance, investment, and risk management. From AI theory to machine learning modelling, this course provides a powerful introduction to and overview of the use of AI financial industry in practice in a real-world context. The course takes a sober look at the power and limitations of AI, and how it can be effectively deployed in the financial industry. This course will provide students with insights into the latest AI tools, techniques, and best practices that are reshaping the financial landscape. Also, will empower them to hold the ground in conversations around AI and machine learning as well as formulate their own informed opinions.

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- **Course Objectives**

This course aims at;

- providing the participants a structured approach to cover the key concepts, applications, and implications of AI in the financial industry,
- ensuring that participants understand the Fundamentals of AI and Machine Learning,
- Ensuring the participants gain the Practical Skills in AI Tools and Techniques in the financial industry

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- Course Learning Outcomes:

Upon completion, Students should be able to;

1. Understand the Fundamentals of AI, machine learning, and deep learning, and their relevance to the financial industry.
2. Examine how AI is revolutionizing banking operations, customer service, fraud detection, credit scoring, and personalized financial services.
3. Explore the use of AI algorithms for investment analysis, portfolio management, algorithmic trading, and market prediction in the financial markets.
4. Understand how AI is utilized in underwriting, claims processing, risk assessment, customer engagement, and fraud detection within the insurance sector.
5. Explore the ethical implications and regulatory challenges associated with the adoption of AI in the financial industry, including data privacy, transparency, and bias mitigation.
6. Analyse real-world case studies and practical applications of AI in finance, and gain insights into successful AI implementation strategies and best practices.
7. Discuss emerging trends, future developments, and potential opportunities for AI in the financial industry, including the impact of quantum computing, natural language processing, and explainable AI.

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- Course Content

Chapter 1: Foundations of artificial intelligence and machine learning

Chapter 2: Explaining explainable AI

Chapter 3: Responsible AI

Chapter 4: AI governance frameworks for the banking sector

Chapter 5: Machine learning, alternative data, and the regulation of consumer credit markets and AI-based consumer credit underwriting

Chapter 6: The promises and perils of robo-advisers

Chapter 7: Regulating AI trading from an AI lifecycle perspective

Chapter 8: Opportunities and use cases of AI in the insurance industry

Chapter 9: Regulation of the use of artificial intelligence for investment in the insurance industry

Chapter 10: Regulating artificial intelligence in finance and other regulated industries

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- **Course Content**

Chapter 1: Foundations of artificial intelligence and machine learning. The chapter includes the following;

- Artificial Intelligence
- Fundamentals of Machine Learning
- Key Concepts in AI and Machine Learning
- Neural Networks and Deep Learning
- Algorithms and Models
- Data Preprocessing and Feature Engineering

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- **Course Content**

Chapter 2: Explaining explainable AI. The chapter includes the following;

- the Need for Explainable AI
- Ethical and Regulatory Considerations
- Interpretable Models and Techniques
- Linear Models and Decision Trees
- Local Interpretable Model-Agnostic Explanations (LIME)
- Shapley Values and Feature Importance
- Visualizing and Communicating Model Explanations
- Visual Explanations and Dashboards
- Natural Language Explanations

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- **Course Content**

Chapter3: Responsible AI. The chapter includes the following;

- Responsible AI
- Ethical Frameworks and Guidelines
- Bias in AI
- Fairness Metrics and Evaluation
- Transparency and Explainability
- Privacy and Security in AI
- Data Privacy and Protection
- Cybersecurity and AI Vulnerabilities
- Accountability and Governance
- Establishing AI Governance Frameworks
- Responsible AI in Practice

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- **Course Content**

Chapter4: AI governance frameworks for the banking sector. The chapter includes the following;

- Role of AI Governance Frameworks
- Regulatory Landscape and Compliance
- Regulatory Guidelines for AI in Banking
- Ethical Considerations and Responsible AI
- Risk Management and Model Governance
- Risk Assessment and Model Validation
- Data Privacy and Security
- Data Privacy and Confidentiality
- Cybersecurity and AI Vulnerabilities
- Implementing AI Governance Frameworks
- Establishing AI Governance Committees
- Case Studies and Best Practices

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- Course Content

Chapter5: Machine learning, alternative data, and the regulation of consumer credit markets and AI-based consumer credit underwriting. The chapter includes the following;

- Machine Learning in Consumer Credit
- The Role of Alternative Data in Credit Assessment
- The Regulatory Landscape and Compliance in Consumer Credit Markets
- The Regulatory Guidelines for AI-Based Credit Underwriting
- The Ethical Considerations and Responsible AI in Consumer Credit
- The Risk Management and Model Governance in Consumer Credit Underwriting
- The Model Governance and Explainable AI in Consumer Credit
- The Data Privacy and Security in AI-Based Consumer Credit Underwriting
- The Data Privacy and Confidentiality in Consumer Credit
- The Cybersecurity and AI Vulnerabilities in Consumer Credit
- Implementing AI-Based Consumer Credit Underwriting
- Establishing AI Governance Committees for Consumer Credit
- Case Studies and Best Practices in AI-Based Consumer Credit Underwriting

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- Course Content

Chapter 6: The promises and perils of robo-advisers. This chapter includes the following;

- Understanding Robo-Advisers
- Role of Robo-Advisers in Wealth Management
- Advantages and Promises of Robo-Advisers
- Accessibility and Affordability
- Automation and Efficiency
- Challenges and Perils of Robo-Advisers
- Regulatory Compliance and Fiduciary Responsibility
- Human Oversight and Investor Protection
- Data Privacy and Security in Robo-Advisory Services
- Data Privacy and Confidentiality
- Cybersecurity and AI Vulnerabilities in Robo-Advisory Platforms
- Balancing Promises and Perils of Robo-Advisers
- Establishing Ethical Guidelines and Best Practices
- Case Studies and Lessons Learned

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- **Course Content**

Chapter 7: Regulating AI trading from an AI lifecycle perspective. This chapter includes the following;

- Introduction to AI in Trading
- The AI Lifecycle in Trading
- Regulatory Landscape for AI Trading
- Risks and Ethical Considerations
- Regulatory Framework Proposal
- Analysis of AI trading incidents and regulatory responses
- The Future of AI Trading Regulation

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- **Course Content**

Chapter 8: Opportunities and use cases of AI in the insurance industry. This chapter includes the following;

- Introduction to AI in the Insurance Industry
- Enhancing Customer Experience with AI
- Risk Assessment and Underwriting
- Claims Processing and Management
- Product Development and Pricing
- AI in Marketing and Sales for Insurance
- Regulatory Compliance and Reporting
- Operational Efficiency and Cost Reduction
- Challenges and Ethical Considerations
- Case Studies in AI Insurance Applications
- The Future of AI in Insurance

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- **Course Content**

Chapter 9: Regulation of the use of artificial intelligence for investment in the insurance industry. The chapter includes the following;

- Overview of artificial intelligence in the insurance industry
- Importance of regulation for AI investments
- The Evolution of AI in Insurance Investment
- Potential Benefits of AI in Insurance Investment
- Risks and Challenges
- Regulatory Considerations for AI Investments
- Best Practices for Regulating AI in Insurance
- Examples of successful AI investment regulation in insurance
- The Future of AI Regulation in Insurance Investment

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- **Course Content**

Chapter 10: Regulating artificial intelligence in finance and other regulated industries. The chapter includes the following;

- Introduction to AI Regulation
- Cross-Industry Regulatory Challenges
- Ensuring transparency and accountability in AI systems
- International Regulatory Perspectives
- Comparison of AI regulatory approaches in different countries
- Global standards and cooperation on AI governance
- Industry Self-Regulation and Ethical Guidelines
- Case studies of self-regulation in practice
- Developing a Regulatory Framework for AI

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- **Teaching activities and Strategies**

The Intended Learning Outcomes will be achieved by achieving the following teaching strategies and activities

- Lectures
- Weekly Discussion
- Weekly Quizzes
- Final Exam

- **General Introduction**

Artificial Intelligence (AI) has emerged as a transformative force in the financial industry, revolutionizing traditional practices and reshaping the way financial institutions operate. With its ability to analyze vast amounts of data, identify patterns, and make complex decisions, AI is driving innovation and efficiency across various sectors within finance.



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Evolution of AI in Finance

The integration of AI in finance represents a significant evolution from traditional methods of data analysis and decision-making. From algorithmic trading to risk assessment and fraud detection, AI has become an indispensable tool for financial institutions seeking to enhance their operations and deliver superior services to clients.

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The Role of AI in Finance

AI technologies, including machine learning algorithms, natural language processing, and predictive analytics, are being leveraged to automate processes, enhance customer experiences, and optimize decision-making in the financial sector. These technologies enable financial institutions to analyze vast volumes of data, detect patterns, and derive actionable insights, leading to more informed and efficient operations.

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Key Applications of AI in Finance

Risk Management: AI algorithms are employed to assess and mitigate financial risks, enabling institutions to make informed decisions and optimize their risk management strategies.

Fraud Detection: AI-powered systems can detect anomalies and patterns indicative of fraudulent activities, providing a proactive approach to combating financial fraud.

Customer Service and Personalization: AI-driven chatbots and virtual assistants are enhancing customer interactions, providing personalized recommendations, and streamlining customer service processes.

Algorithmic Trading: AI algorithms analyze market data, identify trends, and execute trades at speeds and volumes that surpass human capabilities.

Credit Scoring and Underwriting: AI models are utilized to assess creditworthiness, automate underwriting processes, and improve the accuracy of lending decisions.

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Benefits of AI in Finance

The adoption of AI in the financial industry offers several advantages, including:

Enhanced Risk Management

Improved Operational Efficiency

Personalized Customer Experiences

Enhanced Fraud Detection and Prevention

Data-Driven Decision Making

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Ethical and Regulatory Considerations

As AI continues to permeate the financial sector, ethical and regulatory considerations are paramount. Ensuring transparency, fairness, and compliance with data privacy regulations is essential in the responsible deployment of AI technologies within finance.

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Future Outlook

The future of AI in the financial industry holds immense potential for further innovation and disruption. Advancements in AI technologies, coupled with the integration of machine learning and predictive analytics, are poised to drive continued transformation and create new opportunities for financial institutions.

Conclusion

AI is reshaping the financial industry, offering unprecedented capabilities to streamline operations, mitigate risks, and deliver personalized services. As financial institutions continue to embrace AI, the industry is poised for a future defined by innovation, efficiency, and enhanced customer experiences.

The End of Lecture

Thank You