

## Module Outline

<b>Professional Qualification:</b>	Associate Fintech Professional (CPFinT(A)) (QF Level 5)
<b>Programme Title:</b>	Professional Certificate for ECF on Fintech
<b>Module Title:</b>	Fundamental Fintech Tools and Applications (M4)*
<b>Credit:</b>	20 (21 contact hours, 3 examination hours and about 176 self-study hours)
<b>Teaching/Training Activities:</b>	Training Class
<b>Pre-requisite:</b>	N.A.
<b>Remarks</b>	<p>1. Exemption will be granted for practitioners who have passed any of the following training/ professional programme(s)</p> <p><b>a. Training Programme (University Degree)</b></p> <ul style="list-style-type: none"><li>• BEng Fintech of Chinese University of Hong Kong; or</li><li>• MSc Fintech of Chinese University of Hong Kong; or</li><li>• BSc Computational Finance and Financial Technology of City University of Hong Kong; or</li><li>• Associate of Science (Financial Technology) of College of International Education, Hong Kong Baptist University; or</li><li>• MSc Finance (Fintech and Financial Analytics) of Hong Kong Baptist University; or</li><li>• BSc (Hon) Financial Technology and Artificial Intelligence of Hong Kong Polytechnic University; or</li><li>• Doctor Financial Technology of Hong Kong Polytechnic University; or</li><li>• BCom (Hon) in Financial Technology of Hong Kong Shue Yan University; or</li><li>• MSc Fintech of Hong Kong University of Science and Technology; or</li><li>• Advanced Diploma in FinTech of HKU SPACE; or</li><li>• BASc Financial Technology of University of Hong Kong; or</li></ul>

- MSc Fintech of University of Hong Kong; or
  - MSc Financial Technology and Data Analytics of University of Hong Kong; or
- b. An RP who has completed at least one of the certifications in any one of the following specialist areas from key market players or service/platform providers is eligible to apply for exemption on Module 4 of the ECF Fintech Core Level training programme:**
- Artificial Intelligence and Big Data Analytics: e.g. AWS Machine Learning – Specialty, Microsoft AI Engineer, AWS Data Analytics – Specialty, Microsoft Data Engineer, Microsoft Data scientist, Google Data Analytics, etc.
  - Cloud Computing for Business Applications: e.g. AWS Certified Cloud Practitioner, GCP Associate Cloud Engineer, Alibaba Cloud Certified Associate-Cloud Computing, Microsoft Certified: Azure Fundamentals, etc.
  - Blockchain and Distributed Ledger Technology: e.g. Blockchain Certification Course (from EC Council), P. G. Diploma in Blockchain Technology (from UpGrad), Certified Enterprise Blockchain Architect (CEBA), Blockchain Technology — EdX, Blockchain Fundamentals Certificate (from ISACA), etc.
2. \*Pitched at QF Level 5

### Professional Qualification Objective

This Professional Qualification is developed to nurture a broad and sustainable talent pool of entry level and junior level Fintech practitioners for the banking industry. Learners will be equipped with professional knowledge and technical expertise to better respond to innovative financial and technological trends.

### Professional Qualification Intended Outcomes (PQIOs) for M1, M2, M3 and M4

Upon completion of the Professional Qualification, candidates should be able to:

PQIO 1:	Acquire the key aspects of Fintech application in banking and financial services
PQIO 2:	Demonstrate in-depth knowledge of the legal and regulatory framework for Fintech governing banking and financial services in Hong Kong
PQIO 3:	Acquire essential knowledge of the financial system, banking products and services
PQIO 4:	Integrate and apply Fintech skills and knowledge to tackle banking and financial services industry challenges and develop practical recommendations or solutions

PQIO 5:	Analyse latest digital developments in Hong Kong and overseas and identify new opportunities for Fintech innovation in banking products, services, and platform
PQIO 6:	Apply the essential principles and industry standards to support the design, development, and promotion of Fintech solutions.

### Module Objective

The module aims to introduce the fundamentals of Machine Learning, Artificial Intelligence, and data analytics with hands-on Natural Language Processing (NLP) and deep learning applications using well-known tools; to introduce cloud computing concepts, services, underlying technologies, charges and budgeting, and provides hands-on experience on container deployment and orchestration to launch business applications; to introduce the concepts and applications of the blockchain technology by covering major blockchains solutions/framework and the architecture of blockchain-based applications.

### Module Intended Outcomes (MIOs) & Units of Competencies (UoCs)

Upon completion of the Module 4, candidates should be able to:

MIOs	Intended Outcome / Competence	Unit of Competencies (UoCs)
MIO 1:	Understand the fundamental concepts of financial technologies (i.e. artificial intelligence, data analytics, cloud computing and blockchain technologies) for Fintech applications in the banking industry.	109580L5/ 107594L5 109365L5 107438L5
MIO 2:	Apply appropriate tools, frameworks, programming techniques and services of financial technologies in various use cases in the banking industry.	109580L5/ 107594L5 109365L5 109379L5 107438L5 107442L5 109379L5

### Assessment Activity

Type of Assessment Activity	PQIO/MIO	Weighting (%)
Examination	MIO 1 - 2	100%

### Examination Format and Duration

Time allowed: 3 hours

The examination consists of:

Section A - 50 Multiple Choice Questions

Section B - 2 out of 3 Short Questions

Examination passing rate: 60% (Combined Mark for both sections)

### CPFinT(A) Certification Requirement

- Completion of Module 1-4 of the ECF on Fintech (Core Level) training; and
- Pass in all examinations of Module 1-4; and
- Having at least 1 year of relevant work experience in Fintech projects and / or any of the functions in Fintech Solution Development, Fintech Product Design, Fintech Strategy and Management or Regtech; and
- Currently as a Relevant Practitioner

### Syllabus

<b>Chapter 1: Tools and Applications for Artificial Intelligence and Big Data Analytics</b>	
1	- History and Definition of terminologies
2	- General framework/steps to perform data analytics
3	- Machine learning algorithms and evaluation metrics
4	- Current Development Trend (NLP & Deep Learning/ Pattern Recognition, Biometric Authentication) with use cases and applications such as news analysis, time series data analysis
<b>Chapter 2: Tools and Applications for Cloud Computing</b>	
1	- Cloud computing as a paradigm
2	- Key enabling technologies
3	- Service models and types of clouds
4	- Virtualization, containers and orchestration
5	- Serverless technologies
6	- Charges and budgeting
7	- Cloud and FinTech
<b>Chapter 3: Tools and Applications for Blockchain and Distributed Ledger Technology</b>	
1	- What is Blockchain?
2	- Cryptocurrency and other applications of Blockchain
3	- Major Blockchain Solutions/Frameworks for Application Development
4	- Application development using Hyperledger Fabric
5	- Introduction of the team structure/organization of personnel for adopting Fintech to plan/design/implement banking products/services

### Recommended Readings

#### Essential Readings:

1. McKinney, Wes (2017). Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython. O'Reilly Media

2. Pandas [[https://pandas.pydata.org/docs/getting\\_started/index.html](https://pandas.pydata.org/docs/getting_started/index.html)]
3. Kaggle [<https://www.kaggle.com/>]
4. Armbrust et al (2009). Above the Clouds: A Berkeley View of Cloud Computing. 25 pages. [<https://www2.eecs.berkeley.edu/Pubs/TechRpts/2009/EECS-2009-28.pdf>]
5. Virtualization Overview White Paper. 11 pages. [<https://www.vmware.com/pdf/virtualization.pdf>. VMware.]
6. Cloudflare. What is the cloud? [<https://www.cloudflare.com/learning/cloud/what-is-the-cloud/>. Cloudflare Inc.]
7. Surianarayanan, Chellammal & Pethuru Raj Chelliah (2019). Essentials of Cloud Computing: A Holistic Perspective. Springer Nature.
8. Androulaki, E., Barger, A., Bortnikov, V., Cachin, C., Christidis, K., De Caro, A., Enyeart, D., Ferris, C., Laventman, G., Manevich, Y., Muralidharan, S., Murthy, C., Nguyen, B., Sethi, M., Singh, G., Smith, K., Sorniotti, A., Stathakopoulou, C., Vukolić, M., ... Yellick, J. (2018). Hyperledger fabric. Proceedings of the Thirteenth EuroSys Conference. [<https://doi.org/10.1145/3190508.3190538>]

### Supplementary Readings

1. Stanfordonline. (2019, March 11). Stanford CS224N: NLP with Deep Learning [<https://www.youtube.com/watch?v=8rXD5xhemo&list=PLoROMvodv4rOhcuXMZkNm7j3fVwBBY42z>. Youtube.]
2. Ng, A. Machine learning [<https://www.coursera.org/learn/machine-learning>. Stanford Online, Coursera]
3. Barroso, Luiz Andre & Holzle, Urs (2009). The Datacenter as a Computer, An Introduction to the Design of Warehouse-Scale Machines [<https://www.morganclaypool.com/doi/pdf/10.2200/S00193ED1V01Y200905CAC006>. Morgan & Claypool Publishers.]
4. The Linux Foundation. (2021). Blockchain: Understanding Its Uses and Implications [<https://www.edx.org/course/blockchain-understanding-its-uses-and-implications>]
5. Murthy, M. (2018, April 18). Life cycle of an Ethereum transaction [<https://medium.com/blockchannel/life-cycle-of-an-ethereum-transaction-e5c66bae0f6e>.]
6. Corda. (2020, July 30). What is Corda? [<https://www.corda.net/blog/what-is-corda/>]

### Further Readings

1. Stanfordonline. (2019, March 21). Stanford CS230: Deep Learning [[https://www.youtube.com/watch?v=PySo\\_6S4ZAg&list=PLoROMvodv4rOABXSygHTsbvUz4G\\_YQhOb](https://www.youtube.com/watch?v=PySo_6S4ZAg&list=PLoROMvodv4rOABXSygHTsbvUz4G_YQhOb). YouTube.]
2. Geron, Aurelien (2019). Hands-On Machine Learning with Scikit-Learn Keras, and TensorFlow:

Concepts, Tools, and Techniques to Build Intelligent Systems. O'Reilly Media

3. Turnbull, James (2014). The Docker Book: Containerization is the new virtualization. James Turnbull
4. Amazon Financial Services [<https://aws.amazon.com/financial-services/>]
5. Zastrin (2021). Ethereum Primer [<https://www.zastrin.com/courses/ethereum-primer/lessons/1-1>]