

## H9PTS: Payments and Transaction Services

<b>Module Code:</b>	H9PTS
<b>Long Title</b>	Payments and Transaction Services <b>APPROVED</b>
<b>Title</b>	Payments and Transaction Services
<b>Module Level:</b>	LEVEL 9
<b>EQF Level:</b>	7
<b>EHEA Level:</b>	Second Cycle
<b>Credits:</b>	5
<b>Module Coordinator:</b>	Rohit Verma
<b>Module Author:</b>	Andrea Del Campo Dugova
<b>Departments:</b>	School of Computing
<b>Specifications of the qualifications and experience required of staff</b>	Lecturer PhD/Master's degree in a computing or cognate discipline. May have industry experience also. Tutor PhD/Master's degree in a computing or cognate discipline. May have industry experience also.
<b>Learning Outcomes</b>	
<i>On successful completion of this module the learner will be able to:</i>	
<b>#</b>	<b>Learning Outcome Description</b>
LO1	Critically analyse Payments and Transaction Services innovations and the Financial and Economics architecture underpinning same
LO2	Investigate and evaluate key concepts relating to Payments and Transaction Services and financial and regulatory plumbing essential to support this economic activity.
LO3	Contextualise and utilise current approaches, applications and technologies in order to develop empirical research using machine learning techniques
LO4	Critically review the economic and financial evolution to modern payment systems
<b>Dependencies</b>	
<b>Module Recommendations</b>	
No recommendations listed	
<b>Co-requisite Modules</b>	
No Co-requisite modules listed	
<b>Entry requirements</b>	Programme entry requirements must be satisfied.

# H9PTS: Payments and Transaction Services

Module Content & Assessment			
Indicative Content			
<b>The Evolution of Payments</b> Evolving Payment Technologies through history			
<b>EU Directives on Digital payments I, Money, Banking and Financial Intermediation Fedwire and Target2</b> Financial intermediation and conventional payment and transaction technologies. Newer platforms (Paypal, Apple Pay, Google Pay, Square, TransferWise) with telecom-and-bank enabled systems (M-Pesa, Equitel), Blockchain/Crypto-based projects (Ripple), corporate initiatives (Facebook's Libra)			
<b>Liquidity, Solvency Central Banks and Fixed Income instruments, Securitization</b> Balance sheet model. Equity as an option. The role central banks play in ensuring liquidity. Debt markets as an essential conduit for borrowing and clearing.			
<b>Blockchain Technological Opportunities and Challenges The potential for stablecoins</b> Is Blockchain a viable technology in the payments space? Or will advances in computing make distributed ledger technology cheaper and more flexible and, if so, when? What frontiers of computer science and encryption are relevant to this financial space. What potentially is the role for stablecoins?			
<b>Empirical Modelling Lending Decisions Interest rate modelling.</b> Build machine learning models to predict the probability that a loan defaults or a mortgage is approved. Modelling interest rates as the cost money and the cost of financial transactions. How will funds management be affected by FinTech? Will P2P platforms like lending club replace bank lending? Credit Enhancement, CDS and Government Guarantees.			
<b>Central Bank and Digital Currency Implications for Banks and Financial Systems. Clearing Houses, Credit risk, Centralised Counterparties and Dodd Frank 2010.</b> Central banks started life as the clearinghouses. Banks all kept accounts at the "central bank" and they used these accounts to settle payments with other banks. The role of ISDA master agreements in clearing swaps and managing collateral. In future Blockchain may decentralise this process but liquidity/solvency will be pressing issues. Derivative markets clear with the operation of margin accounts and centralised counterparties. In future, the landscape of payments and clearing maybe altered by arrival of blockchain technology.			
<b>Regulatory Framework EU Directives on Digital payments II</b> Regulatory issues raised by digital innovations are vast and far reaching. Would the issuer of a digital currency used globally have significant amounts of market power? Would its dominance hinder further innovation?			
<b>International Monetary System and Data Protection</b> On payments systems, what will be the role of cryptocurrencies vis a vis fiat money and private money creation by banks? How will this affect central banks? How would the confidentiality of users' data be protected while at the same time preventing illicit use of the technology for money laundering, tax evasion and terrorist finance?			
<b>Money Supply, Inflation and Cryptocurrencies</b> The quantity theory of money and inflation. Bitcoin as a hedge against inflation. How money supply correlates with Liquidity? Understanding liquidity and the regulation of liquidity in the banking system. What measures are conventionally applied to manage liquidity in banking.			
<b>Financial Inclusion, Fiat Money and Social Product</b> The proposed Libra project has highlighted the question of whether a private label digital currency would enhance financial inclusion. In developing countries in particular existing telecom-enabled platforms like M-Pesa and Equitel have already delivered the bulk of these benefits. What other initiatives can be undertaken to serve the unbanked and integrate them into the payment system.			
<b>Interest rate Determination. Default Risk and Collateral</b> The cost of money is interest and is central to understanding the financial architecture of payments. How is this conventionally managed?			
<b>Deposit insurance. How to level the playing Field</b> Maintaining liquidity in the payment system that banks operate involves providing government guarantees like deposit insurance. Where do the FinTechs fit. Estimating the cost of deposit insurance.			
Assessment Breakdown			%
Coursework			100.00%
<b>Assessments</b>			
Full Time			
Coursework			
<b>Assessment Type:</b>	Formative Assessment	<b>% of total:</b>	Non-Marked
<b>Assessment Date:</b>	n/a	<b>Outcome addressed:</b>	1,2,3,4
<b>Non-Marked:</b>	Yes		
<b>Assessment Description:</b> Formative assessment will be provided on individual or group activities. Feedback will be provided in written or oral format, or on-line through Moodle. In addition, in class discussions will be undertaken as part of the practical approach to learning.			
<b>Assessment Type:</b>	Continuous Assessment	<b>% of total:</b>	40
<b>Assessment Date:</b>	n/a	<b>Outcome addressed:</b>	3
<b>Non-Marked:</b>	No		
<b>Assessment Description:</b> Student should write a series of short essays relating to payments and clearing infrastructure and develop a number of financial models relating to the measurement of loan/deposit guarantees			
<b>Assessment Type:</b>	Project	<b>% of total:</b>	60
<b>Assessment Date:</b>	n/a	<b>Outcome addressed:</b>	1,2,3,4
<b>Non-Marked:</b>	No		
<b>Assessment Description:</b> Empirical estimation and modelling with production of research paper.			
No End of Module Assessment			
No Workplace Assessment			
Reassessment Requirement			
<b>Coursework Only</b> This module is reassessed solely on the basis of re-submitted coursework. There is no repeat written examination.			
<b>Reassessment Description</b> The repeat strategy for this module is by project that covers all learning outcomes.			

## H9PTS: Payments and Transaction Services

Module Workload				
Module Target Workload Hours 0 Hours				
<b>Workload: Full Time</b>				
Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	Classroom and demonstrations	24	Per Semester	2.00
Tutorial	Mentoring and small-group tutoring	12	Per Semester	1.00
Independent Learning	Independent learning	89	Per Semester	7.42
Total Weekly Contact Hours				3.00
<b>Workload: Blended</b>				
Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Independent Learning	Independent learning	89	Per Semester	7.42
Directed Learning	Directed e-learning	12	Per Semester	1.00
Tutorial	Mentoring and small-group tutoring	12	Per Semester	1.00
Lecture	Classroom and demonstrations	12	Per Semester	1.00
Total Weekly Contact Hours				3.00
<b>Workload: Part Time</b>				
Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	Classroom and demonstrations	24	Per Semester	2.00
Tutorial	Mentoring and small-group tutoring	12	Per Semester	1.00
Independent Learning	Independent learning	89	Per Semester	7.42
Total Weekly Contact Hours				3.00

Module Resources
<i>Recommended Book Resources</i>
Gerardus Blokdyk. (2021), Transaction Services A Complete Guide, 5STARCook, p.336.
Pavlo Sidelov. (2018), The World Of Digital Payments: Practical Course (FinTech)., p.450.
<i>Supplementary Book Resources</i>
Richard Cantillon., Essai sur la Nature du Commerce en General.
John C Hull. (2022), 'Option Futures and other Derivatives'.
Jake VanderPlas. (2016), 'Python Data Science Handbook'.
<i>Recommended Article/Paper Resources</i>
Tanai Khiaonrong and Terry Goh 'FinTech and Payments Regulation: Analytical Framework' (2020).
Johannes Ehrentraud, Jermy Prenio, Codruta Boar, Mathilde Janfils and Aidan Lawson. Lawson 'FinTech and payments: regulating digital payment services and e-money' (2021).
Anjan V. Thakor., 'FinTech and Banking' (2019).
<i>Other Resources</i>
<p>[Supplementary Reading], Jon Frost., The economic forces driving FinTech adoption across countries, BIS Working Papers, <a href="https://www.bis.org/publ/work838.htm">https://www.bis.org/publ/work838.htm</a></p> <p>[Supplementary Reading], Jelena McWilliams. FinTech and market structure in financial services Financial Stability Board, <a href="https://www.fsb.org/2019/02/fintech-and-market-structure-in-financial-services-market-developments-and-potential-financial-stability-implications/">https://www.fsb.org/2019/02/fintech-and-market-structure-in-financial-services-market-developments-and-potential-financial-stability-implications/</a></p> <p>[Supplementary Reading], The Future of Banking FDIC Chair (October 1, 2019), <a href="https://www.csbs.org/newsroom/fdic-chair-man-mcwilliams-future-banking">https://www.csbs.org/newsroom/fdic-chair-man-mcwilliams-future-banking</a></p> <p>[Supplementary Reading], Stephen Quinn and William Roberds. How a Ledger became Money: A History of the Bank of Amsterdam René M. Stulz (2019), 'FinTech, BigTech, and the Future of Banks'.</p> <p>[Supplementary Reading], Financial Stability Board, (November 1, 2017) (Pages 3–23, Executive Summary &amp; Sections 1–3), <a href="https://www.fsb.org/2017/11/artificial-intelligence-and-machine-learning-in-financial-service/">https://www.fsb.org/2017/11/artificial-intelligence-and-machine-learning-in-financial-service/</a></p> <p>[Supplementary Reading], Arthur Bachinskiy. The Growing Impact of AI in Financial Services: Six Examples Medium (February 21 2019), <a href="https://towardsdatascience.com/the-growing-impact-of-ai-in-financial-services-six-examples-da386c0301b2">https://towardsdatascience.com/the-growing-impact-of-ai-in-financial-services-six-examples-da386c0301b2</a></p> <p>[Supplementary Reading], Artur Olechowski. 7 Key Payments Innovations in FinTech for 2020 Codete, (February 13, 2020), <a href="https://codete.com/blog/7-key-payments-innovations-in-fintech-for-2020/">https://codete.com/blog/7-key-payments-innovations-in-fintech-for-2020/</a></p> <p>[Supplementary Reading], Estelle Mense. 9 Payment Trends That Will Shape 2020 BlueSnap, (December 5, 2019), <a href="https://home.bluesnap.com/snap-center/blog/9-payment-trends-that-will-shape-2020/">https://home.bluesnap.com/snap-center/blog/9-payment-trends-that-will-shape-2020/</a></p> <p>[Supplementary Reading], Jeremy Brown. Apple Card: 12 FinTech Companies Driving Credit Card Innovation Crunchbase(March 26, 2019), <a href="https://about.crunchbase.com/blog/apple-credit-card-innovation/">https://about.crunchbase.com/blog/apple-credit-card-innovation/</a></p> <p>[Supplementary Reading], Get to Know Your Marketplace Lenders American Banker (accessed March 25, 2020), <a href="https://www.americanbanker.com/slideshow/get-to-know-your-marketplace-lenders">https://www.americanbanker.com/slideshow/get-to-know-your-marketplace-lenders</a></p> <p>[Supplementary Reading], Alternative Data Across the Loan Life Cycle: How FinTech and Other Lenders Use It and Why (PDF - 2.3MB) Experian, (December 4, 2018), <a href="https://www.experian.com/assets/consumer-information/reports/Experian_AltDataReport_Final_120418.pdf?elqTrackId=7714ef9f5204e7ca8517e8966438157&amp;elqaid=3910&amp;elqat=2">https://www.experian.com/assets/consumer-information/reports/Experian_AltDataReport_Final_120418.pdf?elqTrackId=7714ef9f5204e7ca8517e8966438157&amp;elqaid=3910&amp;elqat=2</a></p> <p>[Supplementary Reading], John F. Chown. A History of Money: From AD 800 Google Books version. Chapter 5 is "The Great Debasement of Henry VIII's Reign", <a href="https://books.google.ie/books?id=UCOZpx2hjL8C&amp;pg=&amp;hl=en">https://books.google.ie/books?id=UCOZpx2hjL8C&amp;pg=&amp;hl=en</a></p> <p>[Supplementary Reading], Federal Reserve: Recent Balance Sheet Trends, <a href="http://www.federalreserve.gov/monetarypolicy/bst_recenttrends.htm">http://www.federalreserve.gov/monetarypolicy/bst_recenttrends.htm</a></p> <p>[Supplementary Reading], The weekly consolidated balance sheet of the Eurosystem from the ECB., <a href="http://www.ecb.europa.eu/press/pr/wfs/2018/html/index.en.html">http://www.ecb.europa.eu/press/pr/wfs/2018/html/index.en.html</a></p> <p>[Supplementary Reading], Information on Payments Systems: TARGET2 and Fedwire., <a href="http://www.ecb.int/paym/t2/html/index.en.html">http://www.ecb.int/paym/t2/html/index.en.html</a></p> <p>[Supplementary Reading], Information on Payments Systems., <a href="http://www.federalreserve.gov/paymentsystems/fedfunds_data.htm">http://www.federalreserve.gov/paymentsystems/fedfunds_data.htm</a></p> <p>[Supplementary Reading], ECB:The demand for currency in the euro area and the impact of the euro cash changeover, <a href="http://www.ecb.int/pub/pdf/other/pp39_51_mb200301en.pdf">http://www.ecb.int/pub/pdf/other/pp39_51_mb200301en.pdf</a></p> <p>[Supplementary Reading], Paul De Grauwe and Magdalena Polan. Is Inflation Always and Everywhere a Monetary Phenomenon?, <a href="http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.129.6996&amp;rep=rep1&amp;amp;type=pdf">http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.129.6996&amp;rep=rep1&amp;amp;type=pdf</a></p> <p>[Supplementary Reading], Website, <a href="https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.129.6996&amp;rep=rep1&amp;type=pdf">https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.129.6996&amp;rep=rep1&amp;type=pdf</a></p> <p>[Supplementary Reading], Steve H. Hanke and Nicholas Krus, World Hyperinflation Top Five Hyperinflations, <a href="https://www.cato.org/sites/cato.org/files/pubs/pdf/workingpaper-8.pdf">https://www.cato.org/sites/cato.org/files/pubs/pdf/workingpaper-8.pdf</a></p> <p>[Supplementary Reading], The ECB's ELA Procedures, <a href="https://www.ecb.europa.eu/pub/pdf/other/201402_elaprocedures.en.pdf">https://www.ecb.europa.eu/pub/pdf/other/201402_elaprocedures.en.pdf</a></p> <p>[Supplementary Reading], Vítor Constâncio (2018). Past and future of the ECB monetary policy, <a href="https://www.ecb.europa.eu/press/key/date/2018/html/ecb.sp180504.en.html">https://www.ecb.europa.eu/press/key/date/2018/html/ecb.sp180504.en.html</a></p> <p>[Supplementary Reading], Philip Lane (2019). Monetary Policy and Below-Target Inflation, <a href="https://www.ecb.europa.eu/press/key/date/2019/html/ecb.sp190701-0c1fa3c8fc.en.html">https://www.ecb.europa.eu/press/key/date/2019/html/ecb.sp190701-0c1fa3c8fc.en.html</a></p> <p>[Supplementary Reading], Hyun Song Shin. Reflections on Northern Rock: The Bank Run that Heralded the Global Financial Crisis, <a href="https://www.aeaweb.org/articles/pdf/doi/10.1257/jep.23.1.101">https://www.aeaweb.org/articles/pdf/doi/10.1257/jep.23.1.101</a></p> <p>[Supplementary Reading], Documentation for the Basle 2 Internal Ratings Based model., <a href="http://www.bis.org/bcbs/irbriskweight.htm">http://www.bis.org/bcbs/irbriskweight.htm</a></p> <p>[Supplementary Reading], Philipp Hildebrand. Is Basel II Enough? The Benefits of a Leverage Ratio, <a href="http://www.bis.org/review/r081216d.pdf?frames=0">http://www.bis.org/review/r081216d.pdf?frames=0</a></p> <p>[Supplementary Reading], Andrew Haldane and Vasileios Madouros. 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[Supplementary Reading], Andrew Haldane. The Bank and the banks.,  
<http://www.bis.org/review/r121019a.pdf>

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<http://www.fsb.org/wp-content/uploads/20151106-TLAC-Press-Release.pdf>

[Supplementary Reading], Basel Committee on Banking Supervision, High-level summary of Basel III reforms,  
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[https://www.mckinsey.com/~media/mckinsey/business\\_functions/risk/our\\_insights/basel\\_iv\\_whats\\_next\\_for\\_european\\_banks/basel-iv-whats-next-for-banks.ashx](https://www.mckinsey.com/~media/mckinsey/business_functions/risk/our_insights/basel_iv_whats_next_for_european_banks/basel-iv-whats-next-for-banks.ashx)

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<http://www.federalreserve.gov/releases/h15/update/>

[Supplementary Reading], NTMA Bond report,  
<http://www.ntma.ie/bond-index-reports/>

[Supplementary Reading], Historical yield curve data from the Federal Reserve FOMC Statements,  
<https://www.federalreserve.gov/monetarypolicy/fomccalendars.htm>

[Supplementary Reading], Joseph Gagnon, Matthew Raskin, Julie Remache, Brian Sack, Large-Scale Asset Purchases by the Federal Reserve: Did They Work?,  
[http://www.ny.frb.org/research/staff\\_reports/sr441.pdf](http://www.ny.frb.org/research/staff_reports/sr441.pdf)

[Supplementary Reading], Stefania D'Amico and Thomas B. King: Flow and Stock Effects of Large-Scale Treasury Purchases,  
<http://www.federalreserve.gov/pubs/feds/2010/201052/201052abs.html>

[Supplementary Reading], Olivier Blanchard (2016): The US Phillips Curve: Back to the 60s?,  
<https://www.piie.com/system/files/documents/pb16-1.pdf>

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<http://www.stanford.edu/~johntayl/Papers/Discretion.PDF>

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[Regulatory Framework], Website,  
[https://finance.ec.europa.eu/consumer-finance-and-payments/payment-services/payment-services\\_en](https://finance.ec.europa.eu/consumer-finance-and-payments/payment-services/payment-services_en)

Discussion Note: