Minor Description Introduction to blockchain technology (15 ECT) + Blockchain & Cryptocurrencies Business, Law & IT (30 ECT)

INTRODUCTION

FinTech innovations create a paradigm shift and blockchain technology currently forms the basis of this shift. We offer you the opportunity to become part of this and ready you for a digital future.

Do you want to learn everything **about Blockchain Technology and her socio-economic consequences**? Then the Minors 'Introduction to Blockchain (15 ECT)' and 'Blockchain & Cryptocurrencies Business, Law & IT (30 ECT)' at the The Hague University are just what you need!

These Minors, with an average student rating of 9.9, are designed together with experts from the field and various companies. You can therefore immediately put your new knowledge into practice by solving a specific blockchain related issue of an organization. **The theory lessons are provided by experts from the professional field and researchers from The Hague University. Classes are held on Thursday's and Fridays, but are not mandatory.**

The Minor also offers you the opportunity to **expand your network** through various events with (inter)national guest speakers (inhouse & outhouse events!). Moreover, the previous excelling students quickly found graduation assignments or part time jobs within the world of Blockchain. **Perhaps interesting as well is the fact that we offer flexible additional routes which you can follow for free. Think Trading Bootcamps, Coding Bootcamps and Personal & Professional development tracks.**

Of course you are not alone in this expedition! This minor runs via the KOIOS infrastructure, where field experts, researchers, organisations, fellow students and you meet up in online and offline environments. KOIOS also enables you to pick flexible routes, assignments, levels and makes education way more personal and social for you! For more general information, visit www.koios.online, for more information about the blockchain minor visit https://www.koios.online/blockchain-technology or click on the landing page: https://www.linkedin.com/pulse/blockchain-minor-2020-powered-koios-dennis-ijlst/

Curious and in need of more info / want to get in contact?

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Or find us in the Slack!
https://join.slack.com/t/koiosonline/shared_invite/enQtNjE0MjAyNzMyODY4LTFlYWlzODRkNTI2ZWExOWM0NGNmMjFjNTU1YzFmZGExOWUzY2EzYTg4NDMwNDVhOTBkMGU0MTFkNzJkN2I5MWM

CLASS SCHEDULE -15 ECT & 30 ECT + PORTFOLIO can be found here. Note: concept, the live version will be integrated on the website www.koios.online

https://docs.google.com/spreadsheets/d/1sGw4X5UaPnChbCMzr55xsIBEtl4lSzXd-XiDAQM5FpA/edit

Description of components	Description text
Title & language	- Introduction to Blockchain (15 ECT*) Internal Osiris code for students THUAS: BFM-HMVT20-BLOCK - Blockchain & Cryptocurrencies Business, Law & IT (30 ECT). Internal Osiris code for students THUAS: BFM-HMVT20-CRYP. 1 ECT = 28 hours. These Minors will be taught in English.
Faculty/ programme offering the minor	Officially powered by THUAS program Finance & Control and Faculty Business, Finance & Marketing (BFM). Collaborative faculties: ITD (IT) & BRV (Law).
Contact person	**General Co-ordinators Minors:** Dennis IJlst (d.ijlst@hhs.nl) & Jordi Jansen (j.m.jansen@hhs.nl) **Economics:** Jamie Jansen: jamie@koios.online **Law:** Caroline van Kordelaar - c.t.vankordelaar@hhs.nl **IT:** Gerard Persoon g.l.a.persoon@hhs.nl
Structure Minor and the combination with Minor "Introduction to Blockchain" (= other minor - 15 ECT)	Both minors start simultaneously, so classes of 15 ECT and 30 ECT start together. After the first period, 10 weeks, the first part `Introduction to Blockchain´ is finished and students than continue with the second part ´Blockchain & Cryptocurrencies Business, Law & IT´. This second part is another 15 ECT, 10 weeks, adding up to a total of 30 ECT. There student select a specialisation in (1) Business / Economics, (2) IT or (3) Law. A visual overview:

	OVERVIEW BLOCKCHAIN MINORS 15 ECT & 30 ECT **MULTIDISCIPLINAIRE FUNDAMENTALS PERIOD A** = PERIOD A **PRACTICAL ASSIGNMENTS IN MULTIDISCIPLINAIRE TEAMS PERIOD A** **END 'INTRODUCTION TO BLOCKCHAIN' IN PERIOD A = IF STUDENTS FINISHES IN PERIOD A = 15 ECT** **Specialisation period B Legal ….TO BE PLANNED** / **Specialisation period B IT Monday & Wednesday** / **Specialisation period B Economics Thursday & Friday** / **Future specialastions (to be announced!) ….** = PERIOD B **PRACTICAL ASSIGNMENTS IN MULTIDISCIPLINAIRE TEAMS PERIOD B** **END 'BLOCKCHAIN & CRYPTOCURRENCIES BUSINESS, LAW & IT' = IF STUDENTS FINISHES PERIOD B= 30 ECT** Additional explanation / background: MULTIDISCIPLINARY = These two green areas 'fundamentals' and 'practical assignment' are cross-faculty and are therefore composed of various disciplines = Contains essential basic components on both economic, technical and legal level and must therefore be followed by ALL students before the specialisation in period B ican be followed. SPECIALIZATION PER COURSE = PLUG & PLAY = Each study program can make its own specialisation in period B and build on the foundations laid in period A. Currently, F & C, Law and IT are already doing this, but there may also start other courses in the future. We encourage multidisciplinary teams where students learn from each other. 15 ECT & 30 ECT POSSIBLE = the student can stop the minor halfway through the minor 'blockchain & cryptocurrencies Business, Law & IT'. In that case, the "Introduction to Blockchain" component can be finished in period A, so that the student receives 15 ECT. Because some studies, both within and outside the HHs, only have to earn 15 ECT, it was decided to offer this part of the minor (= 'Introduction to Blockchain') as a separate minor. Currently, this Minor also runs in academic year 2019/2020. Two minor descriptions have therefore been drawn up, namely a description for Mastering Blockchain (period A) and 'Blockchain & Cryptocurrencies Business, Law & IT' (period A + period B). In period B the in-depth specialization per program takes place. The lessons are spread over several days so that the excelling student can follow various floors. To participate in period B, period A must be successfully completed.
Reason for this Minor	Current economic models are unsustainable. There is an ever-growing inequality between 'rich and poor' and our environment is suffering under consumerism and an insatiable need for growth, profit and overall personal gain. Corruption is deeply rooted in our governments and financial systems and exist because of crooked incentives. New technologies make it possible to reinvent current models, include people from all layers of society and do so in a relatively short period of time. These models need to be tried, tested and developed further through means of education. Humanity seems to be at a tipping point. There seems to be a clear understanding amongst us that we need to change our behaviour and rethink our way forward. Technology can help us in this process and in the next five to ten years, available technologies will be capable of actually providing the infrastructure for this change. The internet was a giant first step, but full integration of our species has not happened yet. Our internet is still flawed and is not censorship resistant, resulting in abuse of power by those that can gain control over parts of it.

	Blockchain could provide us with a solution to this and many more problems. Furthermore, current financial models exclude a very large part of the world's population. In the next decade, the internet, mobile phones, AI, the internet of things and blockchain technology offer us an opportunity to drastically change the way the world works and include everyone capable of owning a mobile phone. This Blockchain Minor is grabbing this opportunity with both hands, realizing the aforementioned problems can be dealt with. With a focus on, but not limited to, the financial, legal and technological aspects of the issues that we face, we will educate and prepare people from all corners of our societies. This transition doesn't happen without getting our hands dirty and we want to be at the frontline of this transition.
Important Educational Elements	1. Multidisciplinary Minor where theoretical foundations are offered in blended form via www.koios.online and offline KOIOS locations. Online is the common shared foundation and created by an ecosystem of multiple partners. Offline every entity can deviate and add their own regional flavour in the mix. Other than acquire new theoretical knowledge, students run a joined multi-disciplinary blockchain related social assignment, to be executed for and with an external field partner. An example would we: solve blockchain issue XXX for organisation XXX. So in short: strong shared online theoretical foundations with offline regional spin-offs in classes and regional field assignments. 2. Another important aspect is that students have the ability to determine their own paste and route in assignments. Not only can they choose to stick to the regular program or accelerate within the program (for example select multiple specialisations in the second part), but they can pick additional mini-routes by choosing topics & assignments for their individual portfolio, choosing the field assignment or participate in many of the extracurricular activities, like visiting events, joining meet-ups in social communities, participating in hackathons etc. 3. Alongside the practical integration, our Lectorates, like for example ´New Finance´ with Martijn van der Linden, are also partly integrated in the Minor and have a part in guest lecturers as well as project guidance. They will also facilitate, together with multiple field experts, in delivering researched content and in network, events, assignments etc. The Minor will therefore be closely intertwined with the Centre of Expertise "Digital Operations & Finance". 4. This minor is provided via the KOIOS infrastructure (www.koios.online). Therefore, a strong correlation and partnership exists with other KOIOS curricula offered via KOIOS, like the Trading Digital and Financial assets Minor, the Minor Data Analytics and multiple other tracks like Personal & Professional Development.

General Objectives	**Period 1. Introduction to Blockchain (15 ECT)** Main objective of the multidisciplinary period I is that students are able to "explain at a detailed level which technological, financial and legal characteristics blockchain technology has and which socio-economic impact these characteristics have on different scales, like regional, national and global. See further up ahead for a more detailed description, formulated in learning outcomes. **Period 2. Cryptocurrencies, Business, IT & Law (30 ECT). Specialisation Business / Economics** The student explains the blockchain technology compared with various parts of business (finance, control and management process design, strategy, information analyses) but also at the social level. The student designs / invents / builds a practical application in which a blockchain related practical problem is solved and where an implementation advice is formulated. In other words: on micro-level will the student be able to recognize opportunities and threats within an organization as a result of blockchain technology and is able to provide an organization with advice and, in cooperation with fellow students, to come to a (partial) implementation of the proposal. On macro-level we discuss the specific impact and possibilities of blockchain technology on global topics like the SDG's and financial systems like the monetary system, global exchange systems and other systems that transfer value. **Period 2. Cryptocurrencies, Business, IT & Law (30 ECT). Specialisation Legal (courses are in Dutch!)** Blockchain technology is developing infinitely faster than the legal framework, both nationally and internationally. It is important that lawyers know about this technology and participate in the social debate and the development of this technology. Therefore, it is important to train students to become acquainted with the legal issues concerning blockchain and the bottlenecks that are experienced during the final phase of their studies. With the knowledge and insight that students obtain, they are able to view blockchain technology from a legal perspective and are able to know the implications of blockchain technology on the legal sector. In other words; the student knows which legal issues exist around blockchain, what the legal status of smart contracts is, how Initial Coin Offerings (ICOs), cryptocurrencies and tokens are legally defined and knows the developments within law regarding blockchain technology. **Period 2. Cryptocurrencies, Business, IT & Law (30 ECT). Specialisation IT** Blockchains will be used within a large number of companies and (government) organisations. Building blockchains requires a broad range of competences, which is why this minor is built in a modular way. One certainly required competence is the IT part, especially being able to program (for) the blockchain. In this part you will learn how to build Decentralised

	Applications as well as on how to apply them on your field assignments (or other use case you might thought off yourself).
Learning outcomes & Summary of contents	**Period 1 Introduction to Blockchain** Fundamentals, also separately available as "introduction to blockchain" for 15 ECT's. During this period we describe the first two levels, offered via https://www.koios.online/blockchain-technology, so level 1 and level 2. Main outcome of the multidisciplinary period A is that students are able to "explain at a detailed level which technological, financial and legal characteristics blockchain technology has and which socio-economic impact these characteristics have on a national and global scale. **Topics per week:** **Week 1** - 1.1 Ledger-nomics **Week 2** - 1.2 Blockchain - 1.3 Satoshi's cheat - 1.4 Why care **Week 3** - 1.5 Money - 1.6 Ethereum - 1.7 Socio-Economic impact **Week 4** - 2.1 DLT - 2.2 Crypto-Flower **Week 5** - 2.3 Layers - 2.4 Players - 2.5 Hardware & Software **Week 6** - 2.6 Transactions, 2.7 Tokenizing Ecosystems **Learning outcomes period 1 = See all LO's below per specialisation, where the LO are more high level in period 1 and more deep dive level in period 2.** **Period 2 Cryptocurrencies, Business, IT & Law – Business / Economics** The student explains the blockchain technology compared with various parts of business (finance, control and management process design, strategy, information analyses) but also at the social level. The student designs / invents / builds a practical application in which a blockchain related practical problem is solved and where an implementation advice is formulated. In other words: the student is able to recognize opportunities and threats within an organization as a result of blockchain technology and is able to provide an organization with advice and, in cooperation with fellow students, to come to a (partial) implementation of the proposal. **Week 1** – Money & Monetary systems **Week 2** – Token economics & Ecosystems **Week 3** – Cryptocurrencies **Week 4** – Decentralised Finance **Week 5** – Business Innovation **Week 6** – Trading & Investment **Exemplary topics:** - "All about Money" - Open Financial Systems - Decentralised Autonomous Organisations - Governance - Smart Contracting & algorithmic decision making - Self-sovereign identity - IoT, AI, Big Data (highlights)

- Innovation management
- Public & Private blockchains
- Crypto & Token Economics
- Network Effects & building ecosystems
- Layer Solutions
- Cyber Security & Risk Management
- Blockchain & Accounting (triple entry accounting or single entry accounting)
- Blockchain & Insurance
- Blockchain & Banking
- Blockchain & Trading Assets
- Blockchain in practice & use cases

Period 2 (specialisation economics)

1. Providing a contribution to the design of the management control system aimed at the management, control and monitoring of an organization, such that the (strategic) goals are achieved (= LO 2 F&C).
LO 1: the student demonstrates that he / she understands the blockchain technology and its technical, economic and social characteristics. Bloom: apply

2. Advising on the organization of the information provision and business processes aimed at managing risks in an organization (LO 4 F&C)
LO 2: the student applies the technical basic principles of blockchain technology in various practical skills and business processes. Bloom: apply

3. Selecting and applying appropriate analysis methods aimed at taking the right decisions by an organization (= LO 3 F&C).
LO 3: the student evaluates the socio-economic impact of blockchain technology & ecosystem. Bloom: evaluate
LO 4: the student assesses the current blockchain projects that try to solve global problems. Bloom: evaluate

4. Finance professionals can translate practical questions in organizations on the basis of a critical analysis into a concrete knowledge need and answer these with practical, feasible advice or designs (eg product, process, model), aimed at decision-making that leads to improvement or renewal of practical situations (occupational aspect of research ability F&C).
LO 5: the student applies the characteristics of blockchain technology to the different types of (global) business strategies, models and processes and evaluates possible opportunities and / or threats for an organization. Bloom: evaluate.
5. Finance professionals are advisory. This means, among other things, that they are communicative in word / and writing, also in an international context. Finance professionals are agile because they can reflect on their own actions and their own learning process and, as a result, can adjust their actions (professional-forming aspect professional craftsmanship F&C).
LO 6: The student constructs in groups an advisory plan for an organization with a blockchain related issue. Bloom: create

Period 2 Specialisation IT

Blockchains will be used within a large number of companies and (government) organisations. Building blockchains requires a broad range of competences, which is why this minor is built in a modular way. One certainly required competence is the IT part, especially begin able to program (for) the blockchain.

The course "Programming Dapps" teaches students to program distributed applications (DAPPS) for the public Ethereum blockchain.After explaining the architecture of blockchain applications, the programming language "Solidity" is explained. With this student practice to create smart contracts, with several dedicated tools. They also learn how to access the smart contracts from javascript programs and websites; both from pc's and from mobile phones. The installation and management of blockchain software is also included in the course. Additionally programming patterns, security, key management and best practices are learned. This also includes creating unit tests for smart contracts. Building blocks like tokens, the Ethereum name service, IPFS (distributed storage), multisig wallets are an essential element of the course. It is important to be able to program (in any programming language) when you want to follow this course. Javascript experience is a big help. Also you need a (fairly capable) laptop on which all the tools are installed. After every theory lesson the students have to make practical assignments to get experience with the Ethereum blockchain and tools.

From list of qualifications and competences Hbo ICT (based on national framework Hbo-I):

D17: Configuration
LO 7: Students uses the current blockchain architecture to build decentralized applications (Bloom: apply).

B4: Motivated selection of ICT related solutions
LO 8: Student chooses which architecture, from high level and low level architecture, is applicable based on the specific situation (Bloom: evaluate)

B4: Motivated selection of ICT related solutions
LO 9: Student evaluates and selects the building blocks to build decentralised applications (network, cryptographic, generic, project based). Bloom: evaluate.

C9: Designing technical infrastructure
D14: Realisation of software
D16: Realisation and using databases
D17: Configuration
E19: Managing designing processes
LO 10: Student creates a decentralised application by using programming languages, decentralised architecture, programming tools, programming patterns and building blocks (LO 9) Bloom: create.

D15: Testing
LO 11: Students creates and runs automated tests to test their decentralised application. Bloom: create.

C6: Software design
C7: Database design

C11: Human Computer Interaction design
LO 12: Student creates a design of a decentralized application combining the knowledge of ICT and other domains (legal, economic, etc.). Bloom: create.

E18: Managing applications, data, information and technical infrastructure
LO13: Student demonstrates how to deploy the decentralized application, how to deploy nodes, and how to manage keys. Bloom: apply.

Period 2 - Specialisation Legal (courses are in Dutch!)
Blockchain technology is developing infinitely faster than the legal framework, both nationally and internationally. It is important that lawyers know about this technology and participate in the social debate and the development of this technology. Therefore, it is important to train students to become acquainted with the legal issues concerning blockchain and the bottlenecks that are experienced during the final phase of their studies. With the knowledge and insight that students obtain, they are able to view blockchain technology from a legal perspective and are able to know the implications of blockchain technology on the legal sector. In other words; the student knows which legal issues exist around blockchain, what the legal status of smart contracts is, how Initial Coin Offerings (ICOs), cryptocurrencies and tokens are legally defined and knows the developments within law regarding blockchain technology.

Legal 1 Juridisch analyseren Niveau 2
Legal 2 Adviseren Niveau 3
Legal 3 Organiseren Niveau 3
Legal 4 Juridisch communiceren N3

LO 14: Students learn which public and private European and Dutch laws and regulations apply to blockchain, smart contracts and cryptocurrencies à legal 1 (Bloom: analyse)

LO 15: Students are able to independently analyze the legal problems with the use of blockchain, smart contracts and cryptocurrencies à legal 1 (Bloom: analyse)

LO 16: On the basis of the legal analysis, students are able to advise companies, citizens and government bodies about possible (legal) risks associated with the use of blockchain, smart contracts and cryptocurrencies and also to offer solutions or solution directions; à Legal 2 and 4 (Bloom: create)

LO 17: Afterwards, students are able to follow the developments in legislation and regulations on the basis of acquired knowledge and insight, and to form and give their own opinion on this à Legal 4 (Bloom: create)

LO 18: Students are able to create an (juridical) overview of workflow and are able to create a smart contract that follow the rules of law and that are efficiently organised à Legal 3 (Bloom: create) .

Short overview content: this in-depth module deals with the legal aspects of blockchain. In addition, the following topics are discussed.

	1. Formal legal questions
	These are legal questions that play within almost every blockchain, such as:
	- applicable law
	- competition law
	- contract law
	- IE right
	- ownership of a blockchain
	- identity within a blockchain
	- supervision of a blockchain
	- the processing of personal data within a blockchain.
	2. Material legal questions
	These questions depend on the sector in which a blockchain is applied. Examples: blockchain in which electricity is traded must comply with the specific laws and regulations that apply within the energy sector; a blockchain that is used in healthcare will have to comply with the specific laws and regulations that apply within the healthcare sector; etc.
	3. Developments European & Dutch regulations
	Discussed the developments in regulations in Europe and the Netherlands. This also looks at the regulatory issues that play, such as in the field of privacy.
	4. Smart contracts
	The legal significance, status and appearance of smart contracts are discussed. The following topics are also addressed: offer, acceptance, dissolution, cancellation, unilateral change and general conditions in smart contracts.
	5. Bitcoin, ICOs, cryptocurrencies and tokens
	It discusses how ICOs, bitcoins, cryptocurrencies and tokens are legally defined and which legal issues currently play.
Target group	Students who have to follow a Minor at Bachelor-level and an preference for FinTech. The module is aimed at everyone who is generally interested in the principles and applications of blockchain technology. The teaching material offers tools for both current and future Finance-, IT- and Legal professionals. Also covers strategy & process management on subjects above, as well as implementation.

	It is a multidisciplinary topic, so it is open for all. Experiences taught us that many different types of student enroll, mostly students with a background in either Economics or IT (both: 75% in total, 25% other studies).
Entry requirements	Intermediate English. Assignments may be submitted in regional language (Dutch for example). Prior knowledge is not necessary, the Minor takes students from scratch. Basic knowledge in the form of project management, process control, strategy and IT give the student a possible lead. Period I: Lessons and materials are in English, possibly the student needs to describe his/her motivation as well. Foreknowledge in period I is not necessary, the Minor takes students from basic operations to implementation procedures. Basic knowledge in the form of project management, process control, strategy and IT gives the student a possible lead. Period II F&C: successfully complete period I and preferably background in economics, information management, process management, strategy etc. Period II Legal: successfully complete period I and preferably background in Legal. Courses and materials are given in Dutch for the legal track. Period C IT: successfully complete period I and knowledge of : - Programming - Programming tools - Testing - Network fundamentals - Containers - Linux fundamentals - UX design principles - Security fundamentals - Cryptography fundamentals
Final objectives/ competencies (summary)	**Economics** 1. Provide a contribution to the design of the management control system aimed at the management, control and monitoring of an organization, such that the (strategic) goals are achieved. 2. Selecting and applying appropriate analysis methods aimed at taking the right decisions by an organization. 3. Finance professionals can translate practical questions in organizations on the basis of a critical analysis into a concrete knowledge need and answer these with practical, feasible advice or designs (eg product, process, model), focusing on decision making that leads to improvement or renewal of practical situations . 4. Finance professionals are advisory. This means, among other things, that they are communicative in word / and writing, also in an international context. Finance professionals are agile because they can reflect on their own actions and their own learning process and can adjust their actions accordingly. **Law**

" Door de kennis en vaardigheden die de studenten in deze keuzemodule overkrijgen zijn zij in staat de beroepscompetenties voor de HBO-jurist toe te passen op juridische vraagstukken rondom Blockchaintechnologie. Deze beroepscompetenties zijn: juridisch analyseren, adviseren, belangen behartigen, beslissen en organiseren.

Studenten zijn in staat analyses te maken van juridische vraagstukken rondom Blockchain, inhoudelijk te adviseren over de juridische aspecten van blockchain en de toepassingen daarvan binnen de organisaties waar zij werken en de cliënten van deze organisaties te adviseren. Daarnaast zijn zij in staat een brugfunctie te vervullen tussen juristen en Blockchain-deskundigen, waardoor zij kunnen bijdragen aan het oplossen van vraagstukken binnen organisaties bijv. door herinrichting van werkprocessen. "

Competentie	Niveau	Hoe komen de competenties terug in de minor
Juridisch analyseren	2	**Onderwijs:**
Adviseren	3	Gedurende de onderwijsbijeenkomsten worden de theorie en casussen behandeld mede door gastsprekers uit de praktijk, op basis waarvan studenten in staat zijn om vanuit het juridisch perspectief een bijdrage te leveren aan de (interdisciplinaire) praktijkopdrachten van de aan de minor verbonden opdrachtgevers uit het werkveld.
Vertegenwoordigen		
Beslissen		
Reguleren		
Organiseren	3	
Dossiermanagement		
Juridisch communiceren	3	**Toetsen:** Een projectopdracht, portfolio-opdracht en schriftelijk tentamen

IT:

From list of qualifications and competences Hbo ICT (based on national framework Hbo-I):

D17: Configuration

B4: Motivated selection of ICT related solutions

B4: Motivated selection of ICT related solutions

C9: Designing technical infrastructure

D14: Realisation of software

D16: Realisation and using databases

D17: Configuration

E19: Managing designing processes

D15: Testing

C6: Software design

	C7: Database design
	C11: Human Computer Interaction design
	E18: Managing applications, data, information and technical infrastructure
Description of tests and minimum pass rate	1. In the lessons, written tests are administered, of which five must be sufficiently completed (> 5.5). Students can earn 20 points per test, 100 in total, that account for 20% of the final grade (in short: each quiz point is 0,02 points on your final grade). 2. Students will actively manage a portfolio in which both theoretical knowledge and practical skills are tested. This part must be completed off > 5.5 as well (40%). 3. Field assignment where students solve a real life blockchain problem . Form output differs per assignment. (40%) All three parts must at least score higher than the standard >4.5 rule (in THB). Deviation is necessary because, on the one hand, sufficient understanding of each individual component is essential for the overall understanding of trading and managing digital assets and, on the other hand, because the Minor program is offered on a transboundary basis (where possibly other rules apply). **Total Grade** - 20% test, 40% portfolio, 40% field assignment - Testing usually takes place during the 9th week of the block, while the resit is offered during the 10th week of the next block. MPC quizzes are weekly during the first 6 weeks. - Bonus: n/a
Teaching methods + study load	**Teaching method(s):** Blended learning, classical education, individual and team assignments, presentations, portfolio's and reports. Tokenized education. **Study load:** - Web colleges on own pace. Application of blended learning where students prepare the material at home and come to class to discuss the material. In addition, the homework assignments for the portfolio are related to the teaching material. - Classes, Tutorials + Lectures guest speakers: max. 2 days per week. - Intensive contact with industry i.e. advisory report. max 1,5 day per week. - Individual portfolio; max 1,5 day per week. - We strongly encourage ecosystem learning (on- and offline) via KOIOS. - Minor is considered to be intensive, but instructive by students.
Contact hours per week	Total amount of lecturing hours is a maximum of 12 hours per week in period I and 12 hours for period II per specialisation. Students may follow multiple specialisations or other extracurricular activities. Classes aren't always mandatory (you are allowed to miss 3 classes, but it might depend on the specialisation and lecturer is allowed to deviate). Keep in mind that MPC-exams are given during class, as described below.

	Many hours are assigned to the portfolio and the final assignment. High combination with real experience in the field ("if you want to learn how to ride a bike, you need to hop and make some mileage on the road").
Study and other aids	Required Reading: - Mastering Bitcoin – A. Antonopoulos (will be provided) - Mastering Ethereum – A. Antonopoulos (will be provided) - THUAS Blockchain Reader (will be provided) All is presented per class on https://www.koios.online/blockchain-technology
Partners	**Connected Lectors**: New Finance (M. van der Linden) & via internal field assignments other lectorates and CoE's as well (cross functional assignments, like for example trading with the digital assets (New Finance) that are build by the hardware mining rig (IT) that runs on sustainable energy (Energy) **Networking**: Integration of <u>external</u> field assignments, guest lectures, external specialised digital tools (software as well as hardware!), cross-functional with other programs like projects from New Finance Lectorate such as the sustainable investment bank, the blockchain minor (business, IT & law), cyber security CoE, zero-emission CoE and off course digital operations and finance CoE. **Partners:** • Partners of the blockchain minor (> 35 partners) • Lectorate: New Finance Lectorate. • Regional: Yes!Delft, Municipality The Hague, The Hague Tech, Provence of South Holland. • Community: Odyssey
Minimum and maximum participation	Minimum number of students: 5 Maximum number of students: 150
Full-time/ part-time and term	- 30 ECT: Semester 1 (Sep – Feb) & Semester 2 (Feb - July). - 15 ECT: Semester 1 (Sep – Nov) & Semester 2 (Feb – April) Introduction (15 ECT): classes will be held on Thursday & Friday Economics (30 ECT): classes will be held on Thursday & Friday IT (30 ECT): classes will be held on Monday & Wednesday LAW, is in Dutch (30 ECT): to be determined.
Subject themes (more than one possible)	<table><tr><td>• O Economics and Market O ICT and Media O International themes O Management and Organisation</td><td>O People and Culture O Law, Security and Society O Technology and Design O Work, Welfare and Education</td></tr></table>
Miscellaneous	Open class rooms, possibly combined with other types of students from MBO and professionals from the field. Experiment runs with Municipality The Hague.
OSIRIS code	30 ECT - BFM-HMVT20-CRYP 15 ECT - BFM-HMVT20-BLOCK