Master of Digital Forensics

Admission requirements | Educational qualifications

- Bachelor's degree ICT with specialization Forensic IT (direct admission) or;

- a Bachelor's degree in Computer Science or Digital Forensics incl. knowledge of the below subjects (see annex 1.). If there are deficiencies often there is the option to follow a pre-master program to meet the prerequisites. Alternatively you can submit proof in the form of relevant work experience, certifications or classes taken to demonstrate that you meet the prerequisites. This will be evaluated and determined during the intake process and interview.

An overview of the subjects and the required knowledge can be found in the table below:

ANNEX 1.

Subjects	Required knowledge
Calculus & Statistics	You're able to transform a real-life situation towards a mathematics model, using functions, equations and formulas. Success criteria: • A simple real-life situation has been transformed into aa mathematics model and then solved with that model; • Underlaying knowledge has been demonstrated; Knowledge and application are expected of the following: • Apply arithmetic operations (like calculations with negative numbers, fractions, percentages, exponentiation); • Using formulas; • Solving (simple) equations; • Using Functions (linear, square,exponential, etc.) for e.g. intersection determination, differentiation, recognizing limits and asymptots, etc.;
Object Oriented Programming	You're able to model and develop a (Java) application with complex program structures, using UML and Object Oriented Programming principles. Success criteria: • Sequence, State and class diagram are present; • The application applies to the OO-principles, as written underlaying; • The use of several different complex program structures (see below); • The application is technically and functionally correct; • Underlaying knowledge has been demonstrated; Knowledge and application are expected of the following: 1. UML • Description of Object interaction using a Sequence Diagram • Description of object states using a State Diagram • Creation of an implementation model using a class diagram 2. OO principes

	• OO Principles - DRY • OO Principles - Favore composition • Relations – aggregation en composition • Interfaces and abstract classes • OO Principles - SOLID • OO Principles - LSP (Liskov Substitution) • OO Principles - OCP (Open/Closed) • OO Principles - SRP (Single Responsibility) • Polymorphism • Layer architecture • MPV • Encapsulation 3. Programming structures • ArrayList • File I/O • Java I/O (binary) • Interfaces and abstract classes • Constructor • JavaFX • Event handling in JavaFX • Exception handling • Threads

Forensic IT basics	You're able to initiate, execute and report a simple digital forensics investigation, taking in account the legal context with it's stakeholders. The investigation consists of Computer-, Mobile- and Network Forensics.
	
	Success criteria:
	• A digital forensic investigation lab environment has been created;
	• Reporting is in such way, that the complete investigation is transparant and reproducable;
	• Several different digital forensics has been substantiated used;
	• Underlaying knowledge has been demonstrated;
	
	Knowledge and application are expected of the following:
	• ComputerForensics
	  o Windows Operatingsystem (10 or 11)
	  o Filesytems (e.g. NTFS / FAT32)
	  o Application Forensics (browser, sqlite)
	  o Acquisition artifacts (e.g. volatile memory, devices)
	• Network Forensics
	  o Network protocols
	  o Acquisition network traffic (e.g. WireShark)
	  o Analyses log files
	• Mobile Forensics
	  o Acquisition Artifacts (devices)
	  o Analyses Artifacts

Database Systems	You're able to set up and maintain a complex (relational) database (e.g. PostgreSQL), considering the aspects of: architecture, performance, security and concurrency; Success criteria: • Queries are well optimized and whenever needed, implemented in views, triggers and stored procedures;

	• Naming and structure is according valid rules and conventions; • Security measures are implemented effectively; • Data-integrity is guaranteed; • Underlaying knowledge has been demonstrated; Knowledge and application are expected of the following: • Several databasemanagement solutions: open/closed source, big-/small, non-relational/relational • PostgreSQL, Oracle or comparable • SQLite
Machine Learning	With the help of Machine Learning methods and techniques you have gained insight into, unknown, patterns in data. You have made this data suitable so that these methods and techniques can be applied. You have substantiated how you arrived at the results. Success criteria: • There is an adequate problem definition; • Several statistical models have been applied; • There is a Python environment in which the methods and techniques used are implemented; • The results have been validated. Knowledge and application are expected of the following: • Data Mining: data collection, feature extraction, labeling; • Supervised– en Unsupervised-Learning; • Predictive coding • Cross-validation, ROC-curves, R2
Business & Organizational Processes	You're able to apply several common organizational, business- and market models within a given casus, using relevant methods like, RACI, BPMN and the PLC matrix. Success criteria: • Usage of several relevant methods en techniques; • The coherence of the used methods is clear and well explained; • Underlaying knowledge has been demonstrated; Knowledge and application are expected of the following: • Mintzberg organizational types and the cultural types defined by Hofstede; • Greiner's life cycle model; • The five P's of marketing(product, price, place, promotion and people); • De BCG-matrix and the PLC ; • Five forces model by Porter; • PMC; • Leadership styles; • KPI's; • BPMN 2; • CRUD and RACI;
IT Security	You're able to implement applications/techniques of common • Security- • Integrity- • Cryptography- mechanism within a business context.

Success criteria:

- Underlaying knowledge has been demonstrated;

Knowledge and application are expected of the following:
Security:
- General principles
- Aims and components of information security
- The CIA triad
- Primitives, Policies, Products
- Secure coding principles

Cryptography:
- General principles
- Randomness, entropy
- Symmetric and asymmetric encryption en it's application
- Block and stream ciphers
- Transformation and substitution
- Feistel structure
- Private/ public keys
- Diffie Hellman

Integrity:
- General principles
- Hashing, collisions
- Error correction and detection.

Practize:
- ISMS and Deming Cycle, ISO 27000
- TLS, PKI, certificates
- VPN
- Firewalls
- Identity- and authentication management
- Authorisation (ACL, RBAC)

Computer Architecture basics	You're able to place current IT technologies in a historical perspective, which results in insight in the fundamental operation and coherence and application of these technologies. Success criteria: - Underlaying knowledge has been demonstrated; Knowledge and application are expected of the following: - Binary math - Logic - Basic architecture computersystems and their subsystems, including servers - Storage - Differences between Operating Systems(OS) - Shell-based OS(linux)
Computer Networking	You're able to design and configurate a computer network. You implement networkapplications and are competent to give advice about networks. Success criteria: - A working IP-network with well calculated subnets, including well configured routers and switches;

	• Reporting of the IP-network instruction, showing knowledge and insight of the needed domain matter; • Underlaying knowledge has been demonstrated; Knowledge and application are expected of the following: • Networkarchitecture with the several layers (OSI model) • protocols (HTTP, SMTP, TCP, UDP, etc.) • De werking van proxy en de invloed van deze op de diverse verbindingen • Operation of proxies and the affection on connections • Datatransport, actions (ACK, seq.nr, time-out, etc.) for reliability en knowledge of common errors • Ip-network design and configuration • Cubnet mask, calculation and function knowledge • Ethernet, CSMA/CA, CSMA/CD • Wireless networks (IEEE.802.11) • TCP/IP tools (ipconfig, ping, route, etc.) • Network hardware (hub, bridge, switch, router, etc.)