Syllabus
AI Basics certification exam

A AI4NL Certification that equips business professionals with essential AI concepts and understanding of its business applications.

Versie 1.0

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Introduction

This syllabus outlines the knowledge that the candidate will be tested on during the Artificial Intelligence Basics Exam. It also provides suggestions for preparation and highlights the benefits of taking this exam. The AI Basics Certification is the basic certification level of the program.

What's covered in AI Basics Exam?

In this section, you'll find details on the structure of the AI Basics Exam and the subjects covered. This serves as a guide to help you prepare for the test.

The exam will assess your general knowledge in the following areas:

- **Data, and Generative AI Definitions:** This section establishes a common vocabulary, providing definitions for key terms. It enhances data literacy by covering the definition of AI, including generative AI (GenAI), and the core techniques in this field.
- **Applications of AI and Their Benefits:** Explore various AI applications, including generative AI models like text (GPT) and image, and their use of data, algorithms (AI recips) , and learning methods. Examples include key domains such as natural language processing, image and video generation, voice synthesis, and predictive analytics.
- **Techniques for Predictions, Algorithms, Machine Learning, and Deep Learning:** Learn about different levels of predictions, key algorithms, and learning approaches, including advancements in deep learning and neural networks. The exam will cover distinctions between various machine learning approaches, algorithms, and data preparation techniques.
- **Approach to Building and Assessing an AI Application:** Understand a modern framework for developing AI applications, using methodologies like CRISP-DM and Agile AI development. This includes the steps involved in building AI solutions and emphasizes the importance of evaluating trustworthiness and ethical considerations at each step.
- **Data Management for Trustworthy AI Applications:** Gain awareness of data dependencies and best practices for acquiring, preparing, managing, and ensuring the quality of data for AI applications. This section also discusses the impact of data biases and the challenges in maintaining fairness and transparency, especially in generative models.
- **Human and Machine**including the role of AI in augmenting human decision-making and the implications of advanced generative AI. This section also addresses concerns about job displacement, ethical use of AI, and the importance of human oversight in AI systems.
- **Risks, AI Regulations, Ethics, and Explainable AI:** Examine the risks and ethical challenges associated with AI, including the need for explainable AI (XAI) and compliance with emerging regulations like the AI Act. This part emphasizes maintaining public trust through transparency, accountability, and ethical AI practices.

The exam does not require:

- **Programming skills or specific toolkit knowledge**
- **Understanding the mathematical foundations of algorithms**

What is the the Netherlands AI Coalition

The Netherlands AI Coalition (AI4NL) is a public-private collaboration which aims to promote the responsible use of AI within the Netherlands. The coalition consists of government, business, educational institutions and communities working together to accelerate AI developments and to share and connect initiatives.

With the Human Capital Agenda (HCA), the AI4NL supports a set of initiatives which aim to raise awareness and capability in the field of AI in The Netherlands. This includes tertiary education at bachelor and masters levels, PhDs and lifelong learning. For more information and activities concerning the AI Coalition refer to the AI4NL website.

The Professional Certification Programme (described in this document) is part of the HCA and is aimed at providing recognised certifications for competency in AI. Whilst this may typically

be achieved by participants following short education paths, the focus of this certification is the competence of professionals as demonstrated by successfully passing an exam, based upon a syllabus issued by AI4NL. The Professional Certification Programme does not accredit training programmes, nor require that participants have followed a training programme.

This programme is therefore complementary to other tertiary education programmes which aim to develop a deeper understanding of AI, how it operates with underlying algorithms, approaches and specialist techniques.

Certification comparison

AI will impact our lives and our working environment. It is essential to develop an awareness of this impact and for those who wish to be proactive, to develop the basic al skills to take advantage of AI and understand its implications. These are steppingstones towards building experience or developing expertise by following in-depth programmes to acquire specialist skills. Therefore a number of certification schemes are available.

The table below visualizes known certification schemes and matched them in topic and difficulty, this certification is highlighted in Blue.

Level	Objective	Certifications	Contact hours
Awareness/ basics level 1	Understanding what generative AI is and the basics of prompt engineering.	EDF Generative AI.	+/- 8
Awareness/ basics level 1	Raise awareness of AI and its applications, risks and benefits.	**AI Basics**, a AI4NL Certification that equips business professionals with essential AI concepts and understanding of its business applications.	+/- 8
		EXIN/BCS AI Essentials (testing a more IT perspective of AI)	+/- 8
Foundation level 1 & 2	Able to identify applications for AI, build a simple model and be aware of how to assess the risks of AI. Able to make informed decisions on the use of AI.	**AI Fundamentals,** A AI4NL Certification for Business and Government (Known as the AI Brevet in the Netherlands).	+/- 20
		EXIN/BCS AI Foundation (this certification is known to be a bit more technical in nature)	+/- 24

The AI Basics Certification exam

You first need to have successfully completed the AI Basics exam to obtain the AI Basics Certificate. The exam procedure is explained in this section.

Practical information

You must pass a multiple-choice exam in which your knowledge of AI will be tested to obtain an AI Basics certificate. All exam candidates will get access to the online exam environment and will need to answer 20 multiple-choice questions within 30 minutes.

You must answer 65% of the questions correctly (or at least 13 of the 20 questions) to pass. Each question has precisely four possible answers where only one is the best answer.

You will receive the result immediately after the exam. (Digital) Access to your certificate will be given once you have passed.

Registration for the exam can be done by purchasing a participation certificate at www.vanharen.net.

Number of questions:	20
Time (minutes) for the exam:	30 minutes
% minimal passing grade	65%
Open/closed book:	Closed
Language:	English.
Exam format:	Online
Type of questions:	Multiple-choice
Are there also negative questions included in the exam? (for example: “which of the following is NOT a machine learning method”)	Yes. Candidates are advised to read the questions carefully.

Levels

The AI Basics Certification tests candidates at levels 1 and 2 according to the Bloom Revised Taxonomy.

Bloom Level 1: Recall & Retention
We test candidates on their ability to memorize factual information, to retain information by collecting, remembering, and recognizing specific knowledge. Knowledge includes facts, terms, answers, or terminology.

Bloom Level 2: Understanding
We test candidates on their ability to construct meaning from oral, written, or graphical pieces of information. This is done by interpreting, summarizing, distracting, comparing, classifying, predicting, or explaining the message.

Contact hours

The AI Basics Exam requires preparation, which means this is an investment in time for personal study and attention for the subject of Agile. You are completely free to do this in several ways.

Refer to the list of topics in this syllabus. Here you can see which subjects you will be tested on during the exam. The time it takes to prepare for the exam depends on your prior knowledge, experience, and training. You should consider that it will take you roughly anywhere from 4 – 16 hours. Commercially offered training sessions that prepare for the AI Basics exam tend to last 1 to 2 days.

Exam structure

The exam specifications describe the topics in the subject matter of the AI Basics exam, and their relative importance. Questions can be asked during the exam about the following subjects.

Module		Sub-module	Bloom-level	% exam question
1.	**What is AI?**	Defines human and artificial intelligence, examines Robert Dilt's logical levels, and links these to different types of AI and discusses the 4th industrial revolution.	1	10%
2.	**Managing Data for AI**	Covers basic data literacy, explores various types of data, describes the semantics and syntax of data and discusses privacy concerns and the deductive potential of data.	1	15%
3.	**Ethics, Risks and Trustworthiness**	Addresses the risks and ethical dilemmas associated with AI, including the need for explainable AI. Introduces EU ethical guidelines, the EU Act and the need to maintain society's trust in the use of AI.	1+2	20%
4.	**Predictions, Algorithms, Machine and Deep Learning**	Introduces the different levels of prediction, an overview of the main algorithms, the common problem types and generative AI modeling. Emphasizes which types of algorithms address which types of problems.	1+2	30%
5.	**Building and assessing an AI application**	Describes a basic approach to building a simple AI application. Describes the CRISP-DM methodology, highlighting the steps involved and increasing awareness of the business context and reliability assessment at each step.	1	25%

Learning objective

Module 1 What is AI?

Elements included in exam

- Importance of data, platform / data driven business models, 4th Industrial Revolution
  - Why is AI in an acceleration phase now – availability of data
  - What is "data driven" and how this impacts business models / ways of working

- Definition of Human and Artificial Intelligence (AI)
  - Robert Dilt's logical levels versus human thinking and existence
  - Use Dilt's logical levels as reference for cognitive taxonomy
  - Link Artificial Narrow, General, Super Intelligence to the Dilt's levels
  - Test using examples how far AI ascends the Dilt's levels

Module 2 Managing Data for AI

Elements included in exam

- What is data
  - Basic data literacy (Data, Information and Knowledge)
  - Types of data
  - Semantic and Syntax of data
  - Privacy and data
  - Awareness of the deductive potential that lies within data (e.g. GPS location)

Module 3 Ethics, Risks, and Trustworthiness

Elements included in exam

- General definition of ethics and awareness of ethical guidelines (EU Framework)
  - Ethical dilemmas
  - Human values versus use of AI and changes to humans, society and organisations
  - EU guidelines for trustworthiness of AI

- Aware of society concerns and objections to the use of AI
  - Concept of Universal Design (Design for all)
  - The European AI Act

Module 4 Predictions, Algorithms, Machine and Deep Learning

Elements included in exam

- Data Analytics
  - Descriptive, diagnostic, predictive and prescriptive analytics
  - Differences between explaining past and predicting the future

- Machine Learning
  - Learning from experience – Tom Mitchell definition
  - (Semi-)Supervised learning
  - Unsupervised learning
  - Reinforcement learning

- Common problem types
  - Classification
  - Regression
  - Time series forecasting
  - Cluster analysis
  - Anomaly detection
  - Association discovery

- Generative AI
  - Capabilities
  - Prompt engineering

Module 5 Building and assessing an AI application

Elements included in exam

- Goals and tasks of building an AI application
- Awareness of a generic approach (CRISP-DM) to building a model:
    - Business Understanding
    - Data Understanding
    - Data Preparation and validation
    - Modelling
    - Evaluation
    - Fit for purpose
    - Deployment / Presentation
    - Understanding pitfalls and risks at each stage of the CRISP-DM process. Awareness of key pitfalls: overfitting, underfitting, bias, low data quality, IT security

- Functionality, Software and Hardware
- Roles needed in an AI project team – domain expert / agile coach / mathematics / programming etc

Exam regulations

General rules

An AI Basics certification via the AI Consortium is an honorary title, and fraud is not tolerated. Your exam will be immediately rejected if fraud is found to have been committed during or after completion of the exam. As a result, you will not be reimbursed for your examination fees.

If you fail to pass the exam, you will not receive a certificate. This also means that you must purchase and take a new exam for your certification. Every candidate only gets one attempt per exam to succeed.

Sharing of exam questions is illegal

It is not allowed to share exam questions with others or make them public. This is a violation of the copyright and IP of the AI Consortium and Van Haren Learning Solutions. Doing so can lead to legal action by Van Haren Learning Solutions with potentially harmful consequences.

Feedback and questions

We have done our best to help you prepare for the AI Basics exam by publishing this syllabus.
We would like to know what you think of this syllabus and the exam. If you have any suggestions for us, we would love to hear from you.

Have fun and take your time preparing for the exam and good luck. Naturally, we also wish you lots of fun in putting what you've learned into practice!

Key terms and concepts

The AI Consortium has worked out several key terms, concepts, and definitions in the list below. You can use these definitions to support and clarify topics related to the exam. Pay attention! If you only learn these terms, then you are often not sufficiently prepared to pass the exam.

Term	Meaning
AGI	Artificial General Intelligence
AI	Artificial Intelligence
DP	Deep Learning
IoT	Internet of Things
IT	Information Technology
ML	Machine Learning
NLP	Natural Language Processing
NN	Neural Network
OCR	Optical Character Recognition