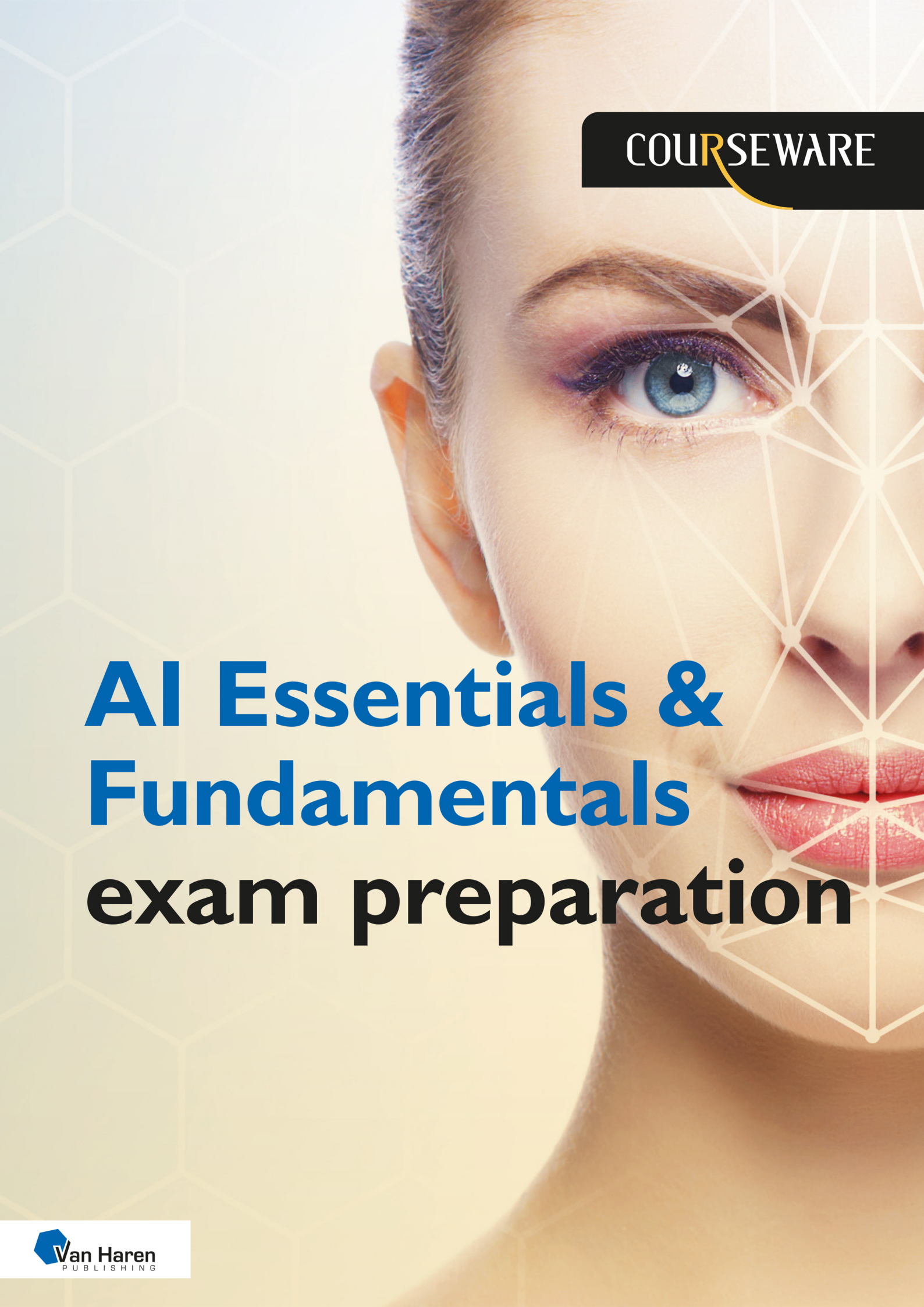
COURSEWARE



AI Essentials & Fundamentals exam preparation

Van Haren PUBLISHING

AI Essentials & Fundamentals
exam preparation

Colophon

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Publisher about the Courseware

The Courseware was created by experts from the industry who served as the author(s) for this publication. The input for the material is based on existing publications and the experience and expertise of the author(s). The material has been revised by trainers who also have experience working with the material. Close attention was also paid to the key learning points to ensure what needs to be mastered.

The objective of the courseware is to provide maximum support to the trainer and to the student, during his or her training. The material has a modular structure and according to the author(s) has the highest success rate should the student opt for examination. The Courseware is also accredited for this reason, wherever applicable.

In order to satisfy the requirements for accreditation the material must meet certain quality standards. The structure, the use of certain terms, diagrams and references are all part of this accreditation. Additionally, the material must be made available to each student in order to obtain full accreditation. To optimally support the trainer and the participant of the training assignments, practice exams and results are provided with the material.

Direct reference to advised literature is also regularly covered in the sheets so that students can find additional information concerning a particular topic. The decision to leave out notes pages from the Courseware was to encourage students to take notes throughout the material.

Although the courseware is complete, the possibility that the trainer deviates from the structure of the sheets or chooses to not refer to all the sheets or commands does exist. The student always has the possibility to cover these topics and go through them on their own time. It is recommended to follow the structure of the courseware and publications for maximum exam preparation.

The courseware and the recommended literature are the perfect combination to learn and understand the theory.

-- Van Haren Publishing

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Van Haren Publishing (VHP) specializes in titles on Best Practices, methods and standards within four domains:

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Topics are (per domain):

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Self-Reflection of understanding Diagram

'*What you do not measure, you cannot control*.'' – Tom Peters

Fill in this diagram to self-evaluate your understanding of the material. This is an evaluation of how well you know the material and how well you understand it. In order to pass the exam successfully you should be aiming to reach the higher end of Level 3. If you really want to become a pro, then you should be aiming for Level 4. Your overall level of understanding will naturally follow the learning curve. So, it's important to keep track of where you are at each point of the training and address any areas of difficulty.

Based on where you are within the Self-Reflection of Understanding diagram you can evaluate the progress of your own training.

Level of Understanding	*Before Training (Pre-knowledge)*	*Training Part 1 (1st Half)*	*Training Part 2 (2nd Half)*	*After studying / reading the book*	*After exercises and the Practice exam*
Level 4 *I can explain the content and apply it .*					
Level 3 *I get it!* *I am right where I am supposed to be.*					Ready for the exam!
Level 2 *I almost have it but could use more practice.*					
Level 1 *I am learning but don't quite get it yet.*					

(Self-Reflection of Understanding Diagram)

Write down the problem areas that you are still having difficulty with so that you can consolidate them yourself, or with your trainer. After you have had a look at these, then you should evaluate to see if you now have a better understanding of where you actually are on the learning curve.

Troubleshooting

Problem areas:	*Topic:*
Part 1	
Part 2	
You have gone through the book and studied.	
You have answered the questions and done the practice exam.	

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

Part 1:

Sample questions AI Basics

1. Which of these is an ethical challenge encountered by machine learning systems?

   a) Ensuring hardware compatibility across all devices
   b) Data overfitting
   c) Data underfitting
   d) Biased data

2. Which of these is a principle of ethical AI?

   a) Profit maximization
   b) Transparency
   c) Complexity
   d) Competition

3. What can be employed to learn from data generated by simulations?

   a) Machine learning
   b) Para View
   c) Astrology
   d) Python

4. Which of the following is an example of narrow AI?

   a) NLP – Natural Language Processing
   b) Human-level conversation bots
   c) Artificial General AI
   d) Fully autonomous self-driving cars

5. What does the EU's Ethical Guidelines employ to demonstrate trustworthy AI?

   a) Customer satisfaction surveys
   b) A human-centric value system
   c) A risk assessment framework
   d) UN’s sustainability goals

6. Which algorithm is typically used to predict how many people will be infected within one or two weeks during the COVID-19 pandemic?

   a) Clustering
   b) Regression
   c) Time series forecasting
   d) Anomaly detection

7. What tool would you typically use to visualize big data?

   a) High-performance computer
   b) Notebook
   c) Desktop
   d) Tablet

8. Machine learning learns from experience, by analyzing what?

   a) Human behavior
   b) Algorithms
   c) Business processes
   d) Data

9. Who benefits from Universal Design?

   a) Developing nations
   b) Researchers
   c) Inanimate objects
   d) Everyone

10. Which factor has the greatest influence on the success of a prediction?

    a) The quality of the data
    b) Whether the algorithm functions as intended
    c) The accuracy metric of the result
    d) The probability density function

11. What term is typically used to refer to moral philosophy?

    a) Legislation
    b) Paradigm
    c) Ethics
    d) Culture

12. What is not required in the future of AI?

    a) Super AI
    b) Narrow AI
    c) Weak AI
    d) Theory of everything

13. What is one of the main contributions of AI to the rapid development of the fourth Industrial Revolution?

    a) Automation
    b) Enhanced design
    c) AI personal assistants
    d) Big data

14. What is the main reason to generally prefer a whitebox AI model over a blackbox AI model?

    a) Higher performance
    b) Higher accuracy
    c) Compatibility with cloud computing services
    d) Greater explainability

15. What is the role of 'prompt engineering' in Generative AI?

    a) Building the data pipelines that allow text input to be fed to a GenAI model
    b) Optimizing the text input that is fed into a GenAI model to achieve optimal output
    c) Summarizing the output of text generated by a GenAI model to fit your particular purpose
    d) Implementing hard-coded guidelines to prevent a GenAI model from giving unethical responses

16. Which of the following is a key characteristic of Human Intelligence?

    a) Emotional understanding
    b) Rapid data processing
    c) Perfect memory recall
    d) Consistent performance

17. For human-centric trustworthy AI, which of the following is essential?

    a) Continuous assessment and monitoring
    b) Human testing
    c) Financial sustainability
    d) Quality assurance certification

18. Learning from experience is associated with human what?

    a) Memory
    b) Intelligence
    c) Agile facilitation
    d) Project management

19. What is the term used to describe the single task focus of machine learning?

    a) Narrow AI
    b) Optimization
    c) Heuristics
    d) Visualization

20. Which discipline best helps us describe how AI arrives at its decisions?

    a) The EU Trustworthiness Criteria
    b) Tom Mitchell's Responsible AI Criteria
    c) Explainable AI
    d) Back Propagation

21. Which problem type is most appropriate for grouping customers based on their past purchasing behavior to send personalized advertisements?

    a) Classification
    b) Anomaly detection
    c) Association discovery
    d) Clustering

22. Which problem type is most appropriate for identifying potential fraudsters based on customer characteristics and behavior?

    a) Classification
    b) Anomaly detection
    c) Association discovery
    d) Clustering

23. Under the European AI Act, at what risk level does the deployment of AI for the purpose of ‘social scoring’ fall?

    a) Unacceptable risk
    b) High risk
    c) Limited risk
    d) Minimal or no risk

24. According to the European AI Act, from which risk level is it mandatory to conduct an adequate risk assessment?

    a) Unacceptable risk
    b) High risk
    c) Limited risk
    d) Minimal or no risk

25. Which type of machine learning is exemplified by an algorithm that learns to recognize traffic lights from a labeled dataset of pictures with and without traffic lights?

    a) Supervised learning
    b) Unsupervised learning
    c) Reinforcement learning
    d) Rule-based learning

26. Which type of machine learning is exemplified by an algorithm that learns to play Go by playing the game against itself?

    a) Supervised learning
    b) Unsupervised learning
    c) Reinforcement learning
    d) Rule-based learning

27. Which type of machine learning is exemplified by an algorithm that estimates whether you will default on a loan, based on past loan data from a bank?

    a) Supervised learning
    b) Unsupervised learning
    c) Reinforcement learning
    d) Rule-based learning

28. Which type of machine learning is exemplified by an algorithm that finds clusters of clients based on their needs and characteristics?

    a) Supervised learning
    b) Unsupervised learning
    c) Reinforcement learning
    d) Group centered learning

29. Why is transparency essential in building trustworthy AI systems?

    a) It ensures that decisions made by AI can be properly challenged and understood.
    b) It helps to improve the processing speed of AI systems.
    c) It allows politicians to identify where AI is being implemented.
    d) Transparency leads to unnecessary debates and discussions.

30. Which of the following is an example of a supervised learning task?

    a) An algorithm organizing news articles into different topics without prior labels
    b) A chatbot learning to communicate by observing human conversations
    c) An algorithm predicting house prices based on location, size and other features
    d) A computer program playing and learning a game by itself

31. Which framework enables us to evaluate levels of intelligence?

    a) Dilt's Logical Levels
    b) The Turing test
    c) Kolmogorov's Axioms
    d) Bloom's Levels

32. Who is often quoted as having defined machine learning?

    a) Marvin Minsky
    b) Tom Mitchell
    c) Alan Turing
    d) Sir James Lighthill

33. Artificial Intelligence is associated with which industrial revolution?

    a) Fourth
    b) Third
    c) Second
    d) First

34. The EU and United Nations have made designing for all individuals a core principle. What is this type of design called?
    a) Utopic design
    b) Accessible design
    c) Core design
    d) Universal design

35. Which statement best describes the difference between data semantics and syntax?

a) Syntax is the format of the data, semantics is the meaning of the data
b) Semantics is the format of the data, syntax is the meaning of the data
c) There is essentially no difference between these two terms
d) Syntax is the metadata of the semantics

36. Visualization is an important skill during what?

a) All stages of a machine learning project
b) Classification of objects
c) Creating PowerPoint slides
d) Setting the objective of an Agile project

37. What does the term 'metadata' refer to?

a) Data that is only relevant for specific purposes
b) Data that provides information about other data
c) Data that is only used by data engineers and not by business users
d) Data that needs to be frequently updated

38. Which of the following represents a stage in data preparation?

a) Encoding
b) Hyper-parameterizing
c) Bias conditioning
d) Deployment

39. What can AI take over from humans?

a) Monotonous tasks
b) Empathy
c) Ambiguous problems
d) High value problems

40. Which of the following examples of data are typically considered structured data?

a) A collection of tweets scraped from the internet
b) A folder containing images from your most recent holiday
c) A list of countries with their GDP over the past 50 years
d) Sound files of the top songs from the past 10 years

41. What is an appropriate starting point for an AI project?

    a) Spending time understanding the business situation and question to be answered
    b) Cleaning and combining data to create a usable dataset
    c) Developing the model and choosing the right algorithm
    d) Exploring different programming languages

42. What is used in data preparation for machine learning?

    a) Randomness
    b) Big data
    c) Ergonomics
    d) Visualization

43. You have completed the initial phase of understanding the business context and the question to be answered in your AI project. What is the most logical next step?

    a) Validating the data for biases, handling outliers, and managing missing data
    b) Selecting the algorithm and necessary tools for implementation
    c) Defining the machine learning process to develop the model
    d) Analyzing the data requirements and comparing them with available data

44. In an Al project the domain expert is the person ...

    a) With technical and managerial oversight of the business plan
    b) Who manages the agile project and writes the technical terms of reference
    c) Who measures the trustworthiness of the AI system
    d) With special knowledge or skills in the area of endeavor and defines what is fit for purpose

45. What/who is best suited to perform monotonous and repetitive tasks that require accuracy?

    a) Human
    b) Machine
    c) Human plus machine
    d) Artificial General Intelligence

46. At the start of an AI project, what is critical to understand?

    a) The costs
    b) The timescales
    c) The decision between buying and building your own AI
    d) The goal

47. In the evaluation phase of your AI project, four team members are debating the results. Whose opinion should you rely on to decide whether to proceed to the next phase?

    a) The agile coach who sees the solution as aligned with innovative thinking and recommends moving forward
    b) The machine learning engineer who demonstrates high model performance on available data and advises continuation
    c) The business domain expert who believes the solution isn't quite fit for purpose and suggests reconsideration
    d) The IT team leader who notes budget overruns and suggests focusing on a simpler model to achieve results now, recommending reconsideration

48. What is the primary purpose of descriptive analytics?

    a) They provide information about what happened in the past
    b) They predict what is likely to happen in the future
    c) They recommend actions you can take to influence future outcomes
    d) They offer a theoretical framework explaining why something happened in the past

49. What is the primary purpose of diagnostic analytics?

    a) They provide information about what happened in the past
    b) They predict what is likely to happen in the future
    c) They explain why something happened in the past
    d) They suggest actions to influence future outcomes

50. What is the primary purpose of predictive analytics?

    a) They provide information about what happened in the past
    b) They explain why something happened in the past
    c) They recommend actions to influence future outcomes
    d) They forecast what is likely to occur in the future

51. What is the primary purpose of prescriptive analytics?

    a) They provide information about what happened in the past
    b) They suggest actions to influence future outcomes
    c) They explain why something happened in the past
    d) They forecast what is likely to occur in the future

52. Which of the following division of data is correct in machine learning?

a) Visualization and optimization data
b) Train and test data
c) Deployment and learning data
d) Ensemble and test data

53. Which of the following applications is NOT an example of AI?

a) Automating repetitive tasks using predefined rules
b) Identifying objects in images
c) Understanding and responding to spoken language
d) Mobile phone voice assistants such as Siri, Google Assistant, and Alexa

Part 2:

Sample questions AI Basics
-
Answers

1. Which of these is an ethical challenge encountered by machine learning systems?

   a) Ensuring hardware compatibility across all devices
   b) Data overfitting
   c) Data underfitting
   d) Biased data

   Explanation: Answer 'd' is correct; Bias in the training data can lead to unfair or discriminatory outcomes when the model is applied, impacting decisions in areas like hiring, lending, and law enforcement. Addressing and mitigating bias is crucial to ensure ethical use of machine learning technologies.

2. Which of these is a principle of ethical AI?

   a) Profit maximization
   b) Transparency
   c) Complexity
   d) Competition

   Explanation: Answer 'b' is correct; Transparency is a principle of ethical AI that emphasizes openness, accountability, and the ability to understand and explain AI systems and their decisions to stakeholders.

3. What can be employed to learn from data generated by simulations?

   a) Machine learning
   b) Para View
   c) Astrology
   d) Python

   Explanation: Answer 'a' is correct; Machine learning can be utilized to learn from data generated by simulations. By analyzing patterns and relationships within the data, machine learning algorithms can uncover insights, make predictions, and optimize processes.

4. Which of the following is an example of narrow AI?

   a) NLP – Natural Language Processing
   b) Human-level conversation bots
   c) Artificial General AI
   d) Fully autonomous self-driving cars

   Explanation: Answer 'a' is correct; Narrow AI, also known as weak AI, is designed to perform a specific task or a narrow range of tasks, such as language translation and image recognition.

5. What does the EU's Ethical Guidelines employ to demonstrate trustworthy AI?

   a) Customer satisfaction surveys
   b) A human-centric value system
   c) A risk assessment framework
   d) UN's sustainability goals

   Explanation: Answer 'b' is correct; The EU's Ethical Guidelines for Trustworthy AI emphasize a human-centric approach to AI development. These guidelines advocate for AI systems that respect human rights, values, and principles, ensuring that AI technologies are designed and used in ways that benefit individuals and society as a whole.

6. Which algorithm is typically used to predict how many people will be infected within one or two weeks during the COVID-19 pandemic?

   a) Clustering
   b) Regression
   c) Time series forecasting
   d) Anomaly detection

   Explanation: Answer 'c' is correct; Time series forecasting analyzes historical infection data over time to project future trends.

7. What tool would you typically use to visualize big data?

   a) High-performance computer
   b) Notebook
   c) Desktop
   d) Tablet

   Explanation: Answer 'a' is correct; Big data visualization often requires significant computational power and memory, which is typically available on high-performance computers rather than on mobile devices like smartphones or tablets.

8. Machine learning learns from experience, by analyzing what?

   a) Human behavior
   b) Algorithms
   c) Business processes
   d) Data

   Explanation: Answer 'd' is correct; Machine learning algorithms use data to detect patterns, learn from examples, and make predictions or decisions without being explicitly programmed for each task.

9. Who benefits from Universal Design?

   a) Developing nations
   b) Researchers
   c) Inanimate objects
   d) Everyone

   Explanation: Answer 'd' is correct; Universal Design aims to create products, environments, and systems that are accessible and usable by people of all abilities, ages, and backgrounds.

10. Which factor has the greatest influence on the success of a prediction?

   a) The quality of the data
   b) Whether the algorithm functions as intended
   c) The accuracy metric of the result
   d) The probability density function

   Explanation: Answer 'a' is correct; High-quality data ensures that the predictive models can generate reliable and meaningful insights.

11. What term is typically used to refer to moral philosophy?

   a) Legislation
   b) Paradigm
   c) Ethics
   d) Culture

   Explanation: Answer 'c' is correct; Moral philosophy is typically referred to as ethics. It deals with questions of right and wrong, good and bad, and moral principles guiding human behavior and decision-making.

12. What is not required in the future of AI?

   a) Super AI
   b) Narrow AI
   c) Weak AI
   d) Theory of everything

   Explanation: Answer 'd' is correct; 'Theory of everything' is a term from theoretical physics that refers to a framework explaining all fundamental forces and particles in the universe. It is not directly related to the development or future of AI.

13. What is one of the main contributions of AI to the rapid development of the fourth Industrial Revolution?

    a) Automation
    b) Enhanced design
    c) AI personal assistants
    d) Big data

    Explanation: Answer 'd' is correct; One of the main contributions of AI to the rapid development of the fourth Industrial Revolution is its ability to harness and analyze big data. AI technologies play a crucial role in processing and extracting insights from the massive volumes of data generated by modern digital systems and IoT devices.

14. What is the main reason to generally prefer a whitebox AI model over a blackbox AI model?

    a) Higher performance
    b) Higher accuracy
    c) Compatibility with cloud computing services
    d) Greater explainability

    Explanation: Answer 'd' is correct; Whitebox models allow users to understand how decisions are made, which is crucial for trust and accountability.

15. What is the role of 'prompt engineering' in Generative AI?

    a) Building the data pipelines that allow text input to be fed to a GenAI model
    b) Optimizing the text input that is fed into a GenAI model to achieve optimal output
    c) Summarizing the output of text generated by a GenAI model to fit your particular purpose
    d) Implementing hard-coded guidelines to prevent a GenAI model from giving unethical responses

    Explanation: Answer 'b' is correct; Prompt engineering involves crafting and refining prompts to guide the AI in generating the desired responses, ensuring that the output is relevant, accurate, and useful for the specific application or context.