The Chartered Institute for IT

2024 | JULY V2.0

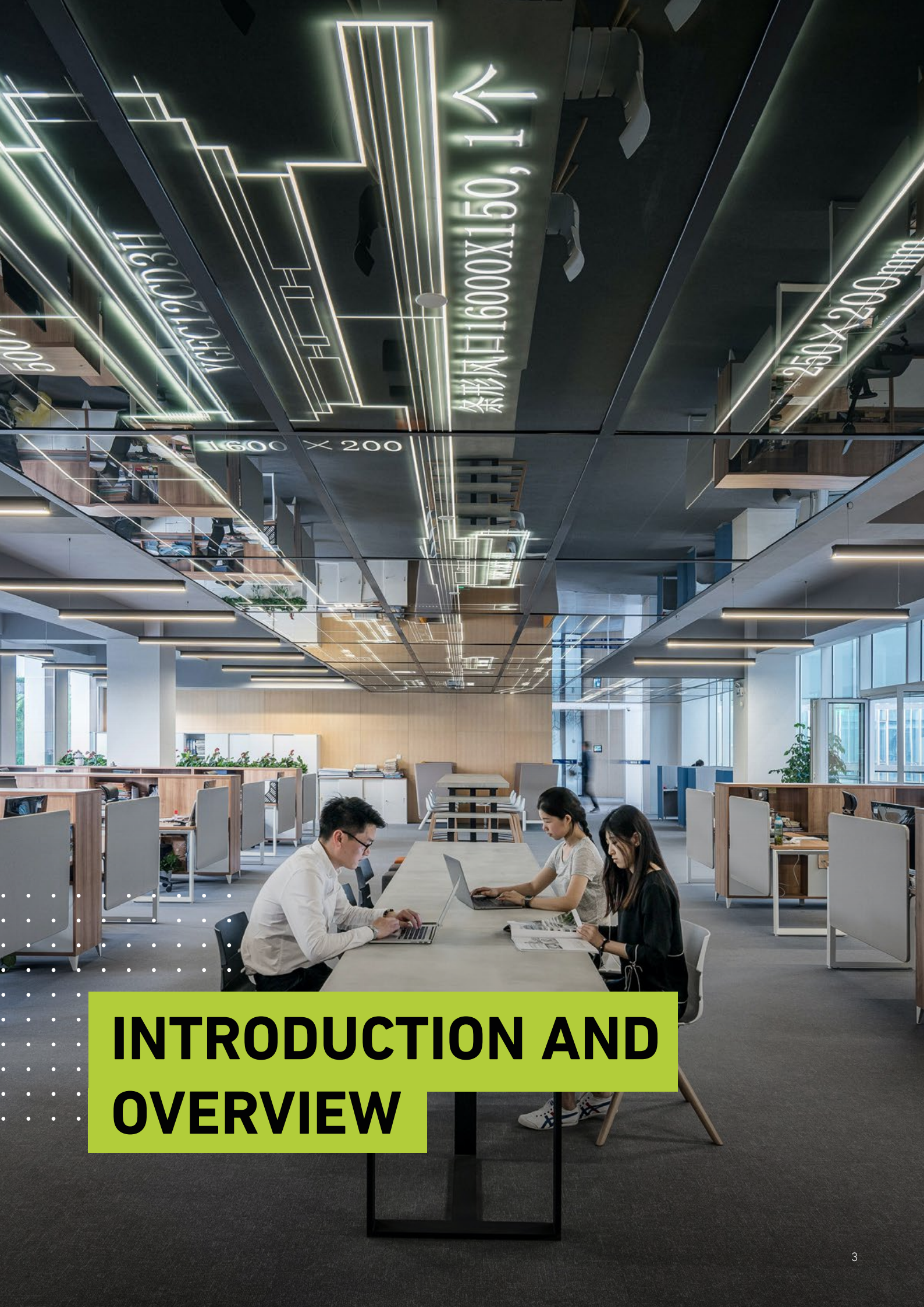
UNDERSTANDING THE ROLE OF ETHICS IN THE RESPONSIBLE USE OF AI

SYLLABUS

BCS FOUNDATION AWARD

This professional award is not regulated by the following United Kingdom Regulators - Ofqual, Qualifications Wales, CCEA or SQA.

CONTENTS



INTRODUCTION AND OVERVIEW

INTRODUCTION

The BCS Foundation Award in Understanding the Role of Ethics in the Responsible Use of AI is designed for anyone wishing to gain an understanding of how an ethical culture can support and ensure responsible use of AI.

AI is increasing in its use. A presence within our workplaces and our homes, there is a greater need now more than ever to understand the moral implications associated with AI and how it is impacting on society. This award considers the responsibility of organisations and society towards ensuring AI is implemented for the good of others. It considers the potential harm AI may pose, and the safeguards that can be implemented to ensure it is used safely, ethically, and for the good of society. Candidates will be exploring the benefits associated with AI and the potential value it can add to the continued evolution of humankind - if managed well.

LEARNING OUTCOMES

- The impact and level of responsibility of AI in an organisation
- Scaling up the impact and responsibility of AI to society
- The potential harm and safeguards
- The role of humans in an AI world

QUALIFICATION SUITABILITY AND OVERVIEW

There are no specific entry requirements for this award. However, some professional experience in a business or IT environment may be advantageous.

This award has been created for IT professionals of all levels, particularly those considering AI as a solution. It aims to provide them with a basic understanding of the ethical challenges posed upon society, whilst also recognising the business benefits.

This award has been created alongside a selection of other awards in the AI space which offer candidates a clear pathway of progression into other disciplines of IT along with a broader knowledge of AI in the workplace.

This makes it ideally suited for those looking for a change in career, an upskilling workforce, sustainable employers and individuals with a background in: science, engineering, knowledge engineering, finance, education or IT services.

This list is not exhaustive and many other roles may benefit.

Candidates can study for this award by attending a training course provided by a BCS accredited training provider or through self-study.

This award represents 4 credits that can count towards the credits required for a BCS Foundation Certificate or Diploma in a relevant discipline.

TOTAL QUALIFICATION TIME	GUIDED LEARNING HOURS	INDEPENDENT LEARNING*	ASSESSMENT TIME
40 hours	16 hours	23.5 hours	30 minutes

*Examples of independent learning include reading of articles or books, watching videos, attendance of other types of training or work shadowing.

TRAINER CRITERIA

It is recommended that to deliver this award effectively, trainers should possess:

- BCS Foundation Certificate in Artificial Intelligence or similar qualification
- A minimum of 2 years' training experience or a recognised training qualification.

SFIA LEVELS

This award provides candidates with the level of knowledge highlighted within the table, enabling them to develop the skills to operate successfully at the levels of responsibility indicated.

LEVEL	LEVELS OF KNOWLEDGE	LEVELS OF SKILLS AND RESPONSIBILITY (SFIA)
K7		Set strategy, inspire and mobilise
K6	Evaluate	Initiate and influence
K5	Synthesise	Ensure and advise
K4	Analyse	Enable
K3	Apply	**Apply**
K2	**Understand**	**Assist**
K1	**Remember**	**Follow**

For further information about SFIA levels can be found at: www.bcs.org/levels

SFIA***PLUS***

This syllabus has been linked to the SFIA knowledge, skills and behaviours required at level 4 for an individual working in the following subject areas.

KSB24

Working collaboratively with others to achieve a common goal.

KSC19

Applying standards, practices, codes, and assessment and certification programmes relevant to the IT industry and the specific organisation or business domain.

SYLLABUS

1. THE ORGANISATIONAL IMPACT AND LEVEL OF RESPONSIBILITY OF ARTIFICIAL INTELLIGENCE (20%) K1/K2

1.1 Identify the levels of responsibility AI has and explain the impact on the organisation.

Indicative content

a. High-stake and low-stake decision-making
b. Levels of sign-off (e.g. by AI and humans; tiered approval processes)
c. Organisational benefits:
    - Automation
    - Personalisation
    - New ways of working
    - Productivity
    - Cost saving
    - Speed
d. Levels of risk associated with the use of AI (permitted/prohibited practices)
e. The impact on the workforce

Guidance

Learners will be able to identify the appropriate level of responsibility that maintains the balance of decision-making authority between AI systems and human oversight. Understanding the difference between high-stake consequences (e.g. strategic organisational/business changes and financial investments) and low-stake decisions (e.g. day-to-day operational choices) within an organisational context is key to determining how responsibilities should be shared and levelled.

Learners should understand the levels of risks associated with AI decision-making, (including potential biases, hallucinations and the unpredictability of AI systems) and the broad impact the integration (i.e. adoption) of AI technologies can have on the workforce and the organisation overall. Consideration should be given to the level at (or sectors in) which it becomes dangerous or problematic to replace human input, and the impact of this on the human workforce.

1.2 Explain the difficulty with establishing ownership of AI and where the responsibility lies.

Indicative content

a. Business owner/organisation leader
b. The user
c. The developer of the AI solution
d. Contract law
e. Intellectual property

Guidance

Learners should understand who may be held responsible, should the development, deployment and use of AI systems cause harm. Individuals and organisations must take responsibility for the decisions and acts made by their AI systems in order for AI to be ethical. This involves putting governance mechanisms in place to deal with any potential biases or harms.

As the impact of generative AI on intellectual property is currently unclear, many aspects of AI are currently regulated through existing laws (HM Government, 2023).

1.3 Explain the need for an organisation to define appropriate use of AI.

Indicative content

a. The purpose AI is intended to fulfil
b. Legal and governance considerations
c. Ethical considerations
d. Risk management
e. Culture

Guidance

Learners should consider an organisation which did not define appropriate use of AI, and the potential risks, such as misuse and unethical practises, this exposes it to. Understanding why there is a need to clearly define how AI should be used and the boundaries separating human and AI tasks is key.

AI can both enhance and be detrimental to the culture of an organisation. For example, the use of AI tools that track keystrokes or monitor computer screens can lead to a feeling of loss of privacy and mistrust. Conversely, AI can be used to optimise schedules and workloads, reducing stress, improving productivity and overall work-life balance.

1.4 Determine the need for protecting wider society.

Indicative content

a. Equality
b. Diversity
c. Inclusion
d. Vulnerable persons
e. Consideration in products

Guidance

Learners should understand the need for an organisation to take responsibility for its use of AI, and the impact this has on its employees, customers and society. Consider how biases present in AI systems can perpetuate existing inequalities, reduce diversity or create new bases for discrimination (e.g. the disproportionate favour of male candidates for senior technical positions).

Developers must also consider the potential unintended harm their products can cause, for example, vulnerable persons may be exposed to inappropriate material if a social media company's AI algorithm fails to monitor and filter harmful content.

1.5 Describe the typical roles in implementing and using AI.

Indicative content

a. Project manager
b. AI committee
c. Information security
d. Business transformation
e. Data architect
f. AI ethics specialist
g. Governance officer
h. Machine learning engineer

Guidance

Learners should understand the duties and responsibilities of different AI-related roles within an organisation, and how they impact one another. For example, organisational/business change colleagues may approve an AI project and work with the elected project manager to determine objectives, which the AI committee will then oversee to ensure these are carried out in an ethical and safe manner.

2. SCALING UP THE IMPACT AND RESPONSIBILITY OF AI TO SOCIETY (20%) K1/K2

2.1 Explain the potential ethical implications of AI for society.

Indicative content

a. Loss of human control vs increased AI autonomy
b. Unintended consequences
c. AI data reinforcing inequalities or biases in society
d. Job displacement
e. Security risks
f. Deception (e.g. fraudulent activities, deepfakes)
g. Negative impacts on human rights
h. Protection of intellectual property rights
i. Lack of accessibility

Guidance

While AI offers huge opportunities, there are also commonly held ethical concerns about its increasingly widespread use. Learners should understand the different areas of concern and their potential impact.

2.2 Describe the impact of AI on sustainability and how it can be leveraged to achieve sustainability goals.

Indicative content

a. Green IT initiatives
b. Data centre energy and efficiency
c. Sustainable supply chains
d. Choice of algorithm
e. Low-code/no-code programming
f. Monitoring and reporting environmental impact
g. Economic impact (e.g. how AI technologies can drive economic growth, improve efficiencies, reduce operational costs, or even potentially lead to job displacement due to automation)
h. UN Sustainable Development Goals (SDGs)

Guidance

The development and running of AI can require significant computational power and consume substantial amounts of energy. Learners should understand the environmental considerations of AI and the different measures that can be taken throughout the AI lifecycle to reduce its environmental impact. Learners should explore how AI can contribute to sustainability, including the SDGs. For example, consider the use of AI in improving the quality of education through enabling adaptive learning and language translation, as well as promoting gender equality by identifying biases.

2.3 Identify the applicable standards and legislation that affect the use and build of AI.

Indicative content

a. UK AI Regulatory Principles
b. Responsible Technology Adoption Unit
c. EU AI Act (2024)
d. Data Protection Act 2018
e. Equality Act 2010
f. Copyright, Designs and Patents Act 1988
g. AI ISO standards

Guidance

Learners should understand the need for regulation that is pro-innovation but which takes a risk-based approach. They should have an understanding of the current and proposed regulations that will influence the development and use of AI in the UK and the EU. Although knowledge of the finer details of the legislation is not required, learners are expected to be aware of the existence and key points of the above-mentioned legislation (e.g. knowledge of all ISO standards is not necessary for the purposes of this qualification but learners should be aware of the role of the standards in general).

Learners should also be aware of the important roles of the Information Commissioner's Office (ICO) and the Alan Turing Institute in the AI landscape (e.g. in terms of governance, development and the ethical use of AI technologies).

'ETHICAL USE OF AI IS A FUNDAMENTAL REQUIREMENT, AND WE NEED TO BUILD IN OUR ETHICS FROM THE START'

Lowe and Lawless (2021), Artificial Intelligence Foundations

3. POTENTIAL HARMS AND SAFEGUARDS (40%) K1/K2

3.1 Identify the areas of concern with AI development.

Indicative content

a. Bias
b. Accountability
c. Privacy
d. Poor quality (e.g. incorrectly implemented AI)
e. Rogue AI
f. Auditability and transparency
g. Ambiguity
h. Lack of talent
i. Lack of informed decision-makers

Guidance

Numerous factors are critical in shaping the development, deployment and governance of artificial intelligence systems. Absence of these can lead to undesirable outcomes. Learners should understand what rogue AI means, and what the potential consequences of its unpredictable and unintended behaviour may be.

Learners should also understand how the other concerns listed may arise and what they may mean for the individual and society. For example, organisations should 'take a risk-based approach when developing and deploying AI', meaning that they should 'assess the risks and implement appropriate technical and organisational measures to sufficiently mitigate' risks (ICO, n.d.).

3.2 Explain how an ethics-first culture can reduce the concerns associated with AI development.

Indicative content

a. SUM values
b. FAST track principles
c. Ethical by design

Guidance

Learners should have an understanding of the ways of working that help alleviate concerns; for example, by applying the FAST principles (fairness, accountability, sustainability, transparency) which focus on governance and operational strategies for AI systems, and the SUM values which act as 'guiding values throughout the innovation lifecycle' (Leslie, 2019).

The Alan Turing Institute, the UK's national institute for data science and artificial intelligence, conducts cutting-edge research that helps to guide the development of AI technologies in a manner that prioritises ethical standards and responsible practices. Learners should be familiar with the institute's role and their guide titled 'Understanding artificial intelligence ethics and safety'.

3.3 Describe key aspects of a visible ethical AI culture.

Indicative content

a. Building culture from the top-down and bottom-up
b. Ethical principles:
    i. UK AI principles:
        - Safety, security and robustness
        - Transparency and explainability
        - Fairness
        - Accountability and governance
        - Contestability and redress
    ii. Floridi & Cowls' principles:
        - Beneficence
        - Non-maleficence
        - Autonomy
c. Whistle-blowing
d. Accountability
e. Professional competence

Guidance

It is important that ethics is a clearly visible part of an organisation's approach to everyday activities and the impact this has on employees, customers and stakeholders. Leaders' commitment (top-down) to ethical practices sets a standard that permeates throughout the organisation and creates precedence for ethical behaviour. The involvement of employees at all levels (bottom-up) is key to empowering individuals to uphold and promote ethical values, contributing to an all-encompassing ethical culture.

Whistleblowing helps maintain the ethical integrity of an organisation and promotes transparency. Learners should be able to identify what constitutes whistleblowing, who is a protected worker by law, and what action could be taken to report wrongdoing (HM Government, 2024).

Learners should be able to identify who accountability lies with for the ethical use and deployment of AI within the organisation. Professional competence should be maintained to enable responsible and effective working practices (e.g. through up-to-date technical skills, knowledge of ethical guidelines and regulation, and the development of critical thinking). Learners should recognise the importance of engaging in continuous development activities.

3.4 Explain the role corporate governance has in supporting responsible AI.

Indicative content

a. Collective decision-making
b. Clearly defined policies, procedures and roles
c. AI ethics committee

Guidance

Learners should be able to explain how corporate governance can support the responsible use of AI through corporate structures and policies. For example, establishing clearly defined roles in the decision-making processes related to AI, having tools in place for ongoing monitoring, and maintaining a support structure should all help to ensure any solution is developed and deployed ethically and in line with the project objectives.

Learners should understand the role of an AI ethics committee in supporting corporate governance and the benefits of this.

4. THE ROLE OF HUMANS IN AN AI WORLD (20%) K2

4.1 Describe the level of responsibility of humans as we move towards a more automated world.

Indicative content

a. Government frameworks
b. Legal
c. Project managers
d. Quality assurance
e. Testers

Guidance

Learners should understand how the roles and responsibilities of humans are transforming because of the increasing integration of automation and AI technologies in various aspects of society and industry. Humans have the responsibility to advocate for and develop government frameworks to address ethical, social and legal implications of AI, ensuring that the use of AI supports the public good. Individuals and organisations must understand their respective roles in creating, enforcing and abiding by the regulations that govern artificial intelligence, and recognise the importance of quality assurance to safeguard against errors and unintended biases.

4.2 Identify how AI allows humans to elevate their position.

Indicative content

a. AI handles the more laborious tasks to allow humans to move into high-value work
b. Taking stress away from the human to focus on other tasks

Guidance

Learners should be able to identify tasks that are currently performed by artificial intelligence and the positive impact this has had on humans. For example, in manufacturing many repetitive manual tasks, such as production line activities, are now completed using AI technology. The benefits of freeing humans of such tasks allow for development in other areas such as training, learning and devoting time to other areas.

4.3 Identify the unique strengths humans have over AI technologies.

Indicative content

a. Sociability
b. Empathy
c. Creativity
d. Leadership
e. Criticality
f. Human + machine

Guidance

Learners should be able to identify the unique traits humans have which cannot be replaced by AI technologies but rather, they can be augmented with AI to enhance human capacity and capability. Personal insight, experience and motivation enable people to think abstractly and make decisions that AI, whose behaviour is pre-determined by algorithms, would be unable to make without human input.

EXAMINATION FORMAT

This award is assessed by completing an invigilated online exam that candidates will only be able to access at the date and time they are registered to attend.

Adjustments and/or additional time can be requested in line with the BCS reasonable adjustments policy for candidates with a disability or other special considerations, including English as a second language.

TYPE

TWENTY MULTIPLE-CHOICE QUESTIONS

DURATION

30 MINUTES

SUPERVISED

YES

THIS AWARD WILL BE SUPERVISED

OPEN BOOK

NO

(NO MATERIALS CAN BE TAKEN INTO THE EXAMINATION ROOM)

PASSMARK

(65%)

13/20

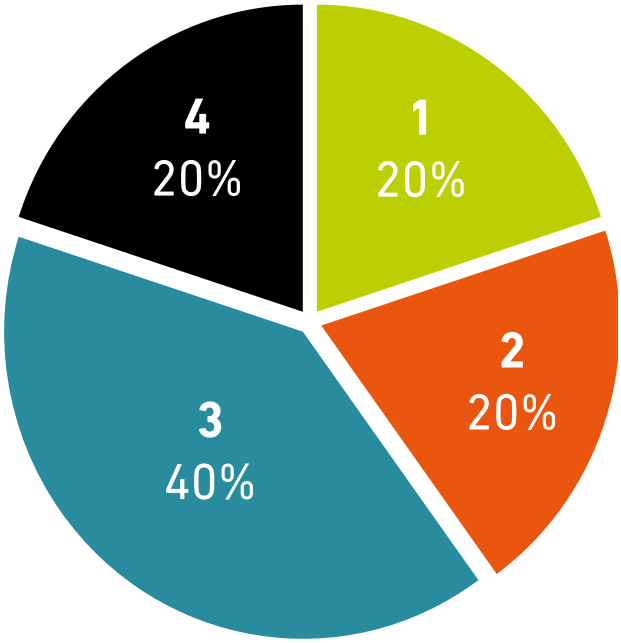
DELIVERY

DIGITAL FORMAT ONLY

QUESTION WEIGHTING

Each major subject heading in this syllabus is assigned a percentage weighting. The purpose of this is:

- Guidance on the proportion of content allocated to each topic area of an accredited course.
- Guidance on the proportion of questions in the exam.



Syllabus Area

1	The organisational impact and level of responsibility of artificial intelligence
2	Scaling up the impact and responsibility of AI to society
3	Potential harms and safeguards
4	The role of humans in an AI world

Question Type

Multiple-choice questions

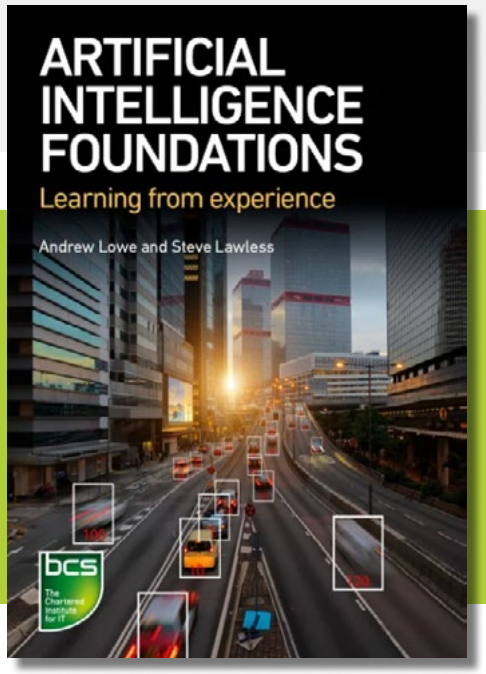
RECOMMENDED READING

The following titles are suggested reading for anyone undertaking this award. Candidates should be encouraged to explore other available sources.

TITLE: Artificial Intelligence Foundations
AUTHOR: Andrew Lowe & Steve Lawless
PUBLISHER: BCS
PUBLICATION DATE: *2021*
ISBN: *978-1-78017-5287*

TITLE: Artificial Intelligence and Software Testing
AUTHOR: Rex Black et al.
PUBLISHER: BCS
PUBLICATION DATE: *2022*
ISBN: *978-1-78017-5768*

TITLE: Cyberethics: Morality And Law In Cyberspace
AUTHOR: Richard A. Spinello
PUBLISHER: Jones and Bartlett; 7th edition
PUBLICATION DATE: *2020*
ISBN: *978-1284184068*



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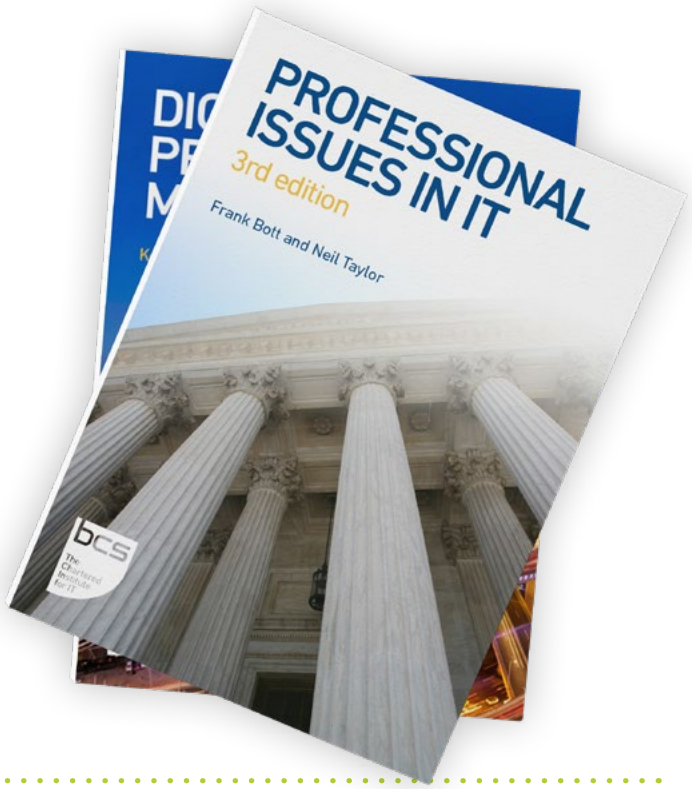

DOCUMENT CHANGE HISTORY

Any changes made to the syllabus shall be clearly documented with a change history log. This shall include the latest version number, date of the amendment and changes made. The purpose is to identify quickly what changes have been made.

VERSION NUMBER	CHANGES MADE
Version 1.0 September 2020	**Syllabus created.**
Version 2.0 August 2024	**Learning objectives, indicative content and guidance updated to reflect current practise.**

REFERENCES

HM Government (2023), Pro-innovation Regulation of Technologies Review Digital Technologies. Available at: https://assets.publishing.service.gov.uk/media/64118f0f8fa8f555779ab001/Pro-innovation_Regulation_of_Technologies_Review_-_Digital_Technologies_report.pdf (Accessed: 11 July 2024)

HM Government (2024), Whistleblowing for employees. Available at: https://www.gov.uk/whistleblowing#:~:text=As%20a%20whistleblower%20you're,happen%20in%20the%20near%20future. (Accessed: 11 July 2024)

ICO (n.d.), How to use AI and personal data appropriately and lawfully. Available at: https://ico.org.uk/media/for-organisations/documents/4022261/how-to-use-ai-and-personal-data.pdf (Accessed: 11 July 2024)

Leslie, D. (2019), Understanding artificial intelligence ethics and safety: A guide for the responsible design and implementation of AI systems in the public sector. Available at: Understanding artificial intelligence ethics and safety: A guide for the responsible design and implementation of AI systems in the public sector. The Alan Turing Institute. https://doi.org/10.5281/zenodo.3240529 (Accessed: 11 July 2024)

Lowe, A. and Lawless, S. (2021). Artificial Intelligence Foundations. [Insert Publisher Location]: BCS, The Chartered Institute for IT.

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