LEVEL 7 ARTIFICAL INTELLIGENCE (AI) DATA SPECIALIST

There is nothing standard about the new apprenticeship Standards!

Following the 2019 - 2021 digital skills review, modern apprenticeships have once again taken a leap forward to provide better vocational training for apprentices and greater benefit to employers. The perfect solution for new career starts, professional upskilling or changes in career direction.

Programme Overview:

Our apprenticeship is designed to enable apprentices devise data-driven AI solutions, to automate and optimise business processes and to support, augment and enhance human decision making.

AI Data Specialists carry out applied research in order to create innovative data-driven AI solutions. They work with datasets that are too large, too complex, too varied and/ or too fast for traditional approaches and techniques.

AI Data Specialists deliver products and processes by advancing the use of data, machine learning and artificial intelligence; using novel research to increase the quality and value of data.

They can interact and collaborate with a broad spectrum of people and provide technical authority and insight to Senior Leaders, Data Scientists, Data Engineers, Statisticians, Analysts, Research and Development Scientists and Academics. Their interactions extend to working externally alongside other organisations, such as local and international governments, businesses, policy regulators, academic research scientists and non-technical audiences.

They will become capable of undertaking projects in an agile environment, and collaboratively maintain technical standards within AI solutions applied across the organisation and its customers. They lead research into AI and its potential application. They collaborate with and influence policy and operations teams to identify areas where AI solutions can create new business opportunities and efficiencies.

Who is it for?

For individuals working in a position which requires them to extract, compile, analyse and moderate volumes of data with a reasonable degree of complexity.

Job titles for this apprenticeship are likely to include:

- AI Engineer
- AI Specialist
- AI Strategy Manager
- Machine Learning Engineer
- Machine Learning Specialist

Entry Requirements:

Entry requirements exist for all funded Further Education programmes. These ensure the value, gain and success of the programme. The ATP will conduct the processes with employers and prospective apprentices to determine correct funding eligibility.

Job role eligibility (known as Competency Role Map):

The job role must contain opportunity for an apprentice to practice the content set out in the apprenticeship Standard to achieve vocational competency. Apprentices must have the opportunity to practice the knowledge taught in training sessions in order to convert new knowledge in to sustainable skills applied in the workplace.

Each apprenticeship requires a portfolio of evidence which will showcase the apprentice's work and will be reviewed by the End Point Assessment Organisation to determine how well new knowledge has been successfully utilised vocationally. If a job role is close to the eligibility criteria we will consult with employers to see if adjustments can be made to ensure criteria is met.

Initial Assessment of existing knowledge and skills:

A prospective apprentice must stand to gain significant knowledge and skills from an apprenticeship. If the apprenticeship is too advanced for them or if they already know much of the knowledge and skills the apprenticeship would provide then they may not be eligible for the funding.

The ATP will review existing qualifications, knowledge and skills to determine if the prospective apprentice will benefit from the proposed apprenticeship such that it meets the funding criteria. In most instances this is very straightforward, however in some instances funding can be specially authorised for reduction in order to fund the parts of an apprenticeship that would be relevant. The ATP will provide the assessment for these possibilities.

Essential entry requirements:

- A relevant degree or equivalent experience
- Understanding and knowledge of a programming language
- Demonstrable logical thinking
- Very high working level of mathematics (a minimum of A-Level maths/statistics or equivalent experience)

An initial assessment will be conducted with every prospective student to establish both eligibility and suitability. This will include a professional discussion and/or a short invigilated examination to test current working levels.

This apprenticeship demands a high level of English and mathematics and a diagnostic assessment will be conducted to provide support and further development in these subjects.

Programme Duration:

This apprenticeship is delivered over 24 months for full-time employees. For part-time employees the term may be extended depending on contracted hours.

Delivery Model:

Apprenticeship training is delivered through a blend of weekly live virtual classrooms and regular mentoring sessions that are held on a one-to-one basis.

These live classrooms are held through Microsoft Teams. This software provides the full suite of educational tools including everything you would find in a conventional classroom and more e.g. live open interactions, private breakout rooms, note and question queues and interactive illustration boards. We can also use movie green screen technology for lesson illustrations.

A full timetable for the training, mentoring, exams and assessments is provided at the outset. Progress is reviewed at 12-week intervals in a meeting between the mentor, apprentice and employer (typically the apprentice's line manager).

Employers and apprentices have full visibility of progress in real-time by accessing the e-portfolio system, alternatively regular updates can be provided by other means if preferred.

End Point Assessment (EPA):

Aside from qualifications that can be obtained by doing an apprenticeship, the most important and valuable goal is what has been achieved during the programme.

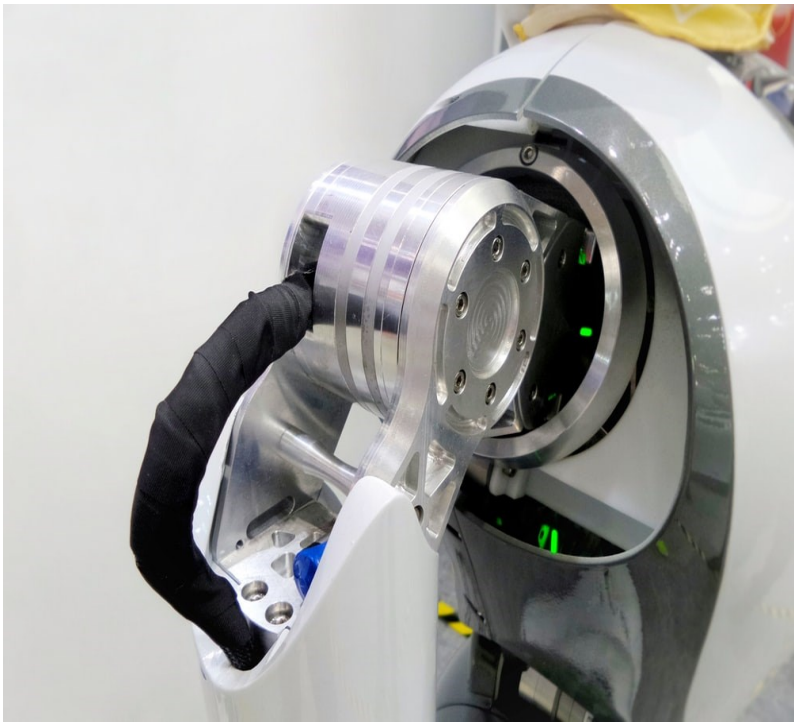
Successful apprentices will obtain a Pass, Merit or Distinction in their apprenticeship. The way a Pass, Merit or Distinction is determined is at a stage called End Point Assessment which takes place once all the leaning has been completed. Like all examinations, a mock will take place before the final assessment.

Once all components of the apprenticeship have been achieved including the mock, a final review is conducted to ensure everything has been covered, this is called gateway. Then the apprentice will undergo their End Point Assessment.

EPA for this programme consists of:

1. Project Report with presentation and supplementary questioning
2. Professional Discussion
3. Technical Test

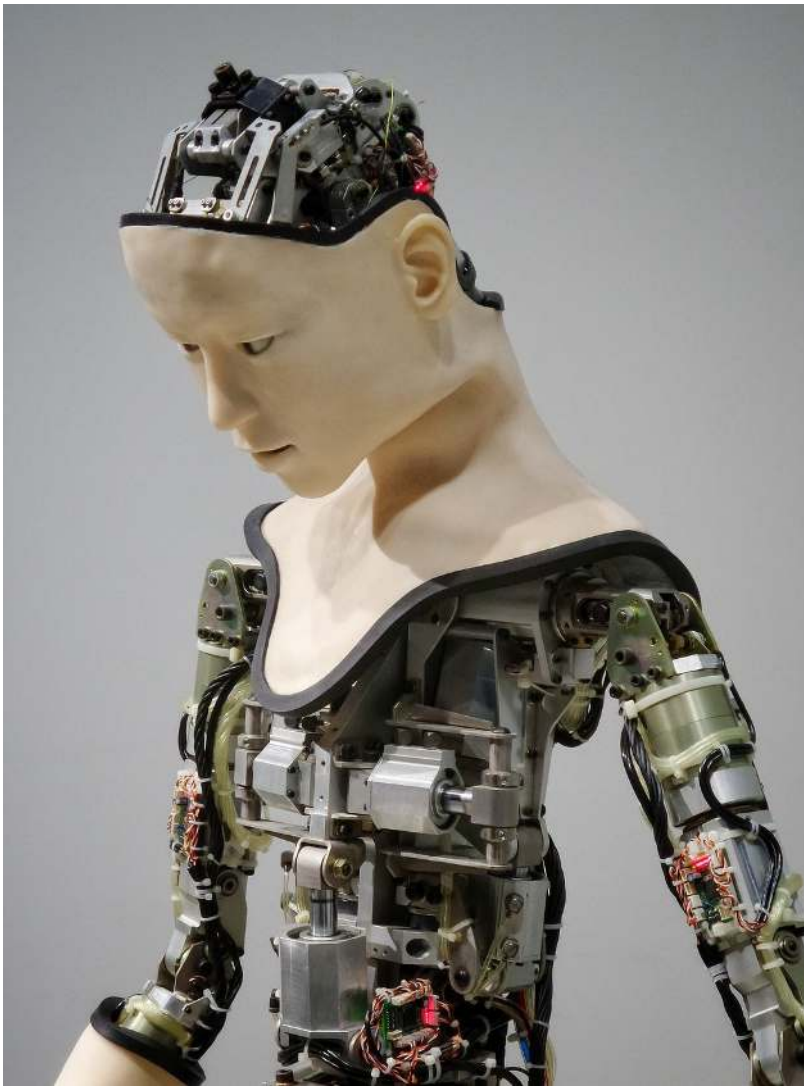
A portfolio of evidence will be gathered throughout the programme to support the apprentice with their professional discussion at End Point Assessment.



Programme Structure:

Technical Competencies:

- How to use AI and machine learning methodologies such as data-mining, machine learning, natural language processing and machine vision
- Application of modern data storage solutions, processing technologies and machine learning methods to maximise impact in drawing conclusions from applied research
- Apply advanced statistical and mathematical methods to commercial projects
- Extract data from systems and link data from multiple systems to meet business objectives
- Design and deploy techniques of data analysis and research to meet needs of the business and customers
- How data products can be delivered to engage the customer, organise information or solve problems using a range of methodologies, including iterative and incremental development and project management approaches
- Solve problems and evaluate software solutions via analysis of test data and results from research, feasibility, acceptance and usability testing
- Interpret policies, standards and guidelines in relation to AI and data
- The current/future legal, ethical, professional and regulatory frameworks which affect the development, launch and ongoing delivery and iteration of data products and services
- Role in supporting organisational strategy and objectives
- Impact of AI, data science and data engineering in industry and society
- Wider social context of AI, data science and related technologies, to assess business impact of current ethical issues such as workplace automation and data misuse
- Identify compromises and trade-offs which must be made when translating theory into practical application
- Business value of a data product that can deliver the solution in line with business needs, quality standards and timescales
- Engineering principles used (general and software) to investigate and manage design, development and deployment of new data products
- High-performance computer architectures and how to make effective use of these
- Identifies industry trends across AI and data science and how to apply them
- Programming languages and techniques applicable to data engineering
- The principles and properties behind statistical and machine learning methods
- How to collect, store, analyse and visualise data
- How AI and data science techniques support and enhance the work of other members of the team
- The relationship between mathematical principles and core techniques in AI and data science within the organisational context
- The use of different performance and accuracy metrics for model validation in AI projects
- Sources of error and bias, including affects of choice of dataset and methodologies applied
- Programming languages and modern machine learning libraries for commercially beneficial scientific analysis and simulation
- Scientific method and application in research and business contexts, including experiment design and hypothesis testing
- Engineering principles used (general and software) to create instruments and applications for data collection
- Accessibility and diversity of user needs



Programme Structure:

Skills:

- Use applied research and data modelling to design and refine database & storage architectures to deliver secure, stable and scalable data products
- Analyse test data, interpret results and evaluate suitability of proposed solutions, considering current and future requirements
- Critically evaluate arguments, assumptions, abstract concepts and data (that may be incomplete), to make recommendations enabling a solution or range of solutions to be achieved
- Communicate concepts and present to diverse audiences, adapting communication techniques accordingly
- Manage expectations and present user research insight, proposed solutions and/or test findings to clients and stakeholders
- Provide direction and technical guidance for AI and data science opportunities
- Work autonomously and interact effectively within wide, multidisciplinary teams
- Coordinate, negotiate with and manage expectations of diverse stakeholders and suppliers with conflicting priorities, interests and timescales
- Manipulate, analyse and visualise complex datasets
- Select datasets and methodologies most appropriate to the problem
- Apply aspects of advanced maths and statistics relevant to AI and data science to deliver outcomes
- Consider associated regulatory, legal, ethical and governance issues when evaluating choices at each stage of a data process
- Identify appropriate resources and architectures for solving computational problems
- Work collaboratively with software engineers to ensure suitable testing and documentation processes are implemented
- Develop, build and maintain the services and platforms that deliver AI and data science
- Define requirements for, supervise implementation of and use data management infrastructure, including enterprise, private and public cloud resources and services
- Consistently implement data curation and quality controls
- Develop tools that visualise data systems and structures for monitoring and performance
- Use scalable infrastructures, high performance networks, infrastructure and services management and operation to generate effective business solutions
- Design efficient algorithms for accessing and analysing large amounts of data, including Application Programming Interfaces (API) to different databases and data sets
- Identify and quantify categories of uncertainty in data output, experiments and analyses
- Apply scientific methods in a systematic process through experimental design, exploratory data analysis and hypothesis testing to facilitate decision making
- Disseminate AI and data science practices across departments and in industry, promoting professional development and use of best practice
- Apply appropriate research methodology and project management techniques
- Select and use programming languages and tools and follow appropriate software development practices
- Select and apply the most effective/appropriate AI and data science techniques to solve complex problems
- Analyse information, frame questions and conduct discussions with subject matter experts and assess existing data to scope new AI and data science requirements
- Undertake independent, impartial decision-making respecting the opinions and views of others in complex, unpredictable and changing circumstances

Behavioural Development:

- Work ethic and commitment to standards and deadlines
- Active integrity with respect to ethical, legal and regulatory elements ensuring the protection of data, safety and security
- Initiative and personal responsibility to overcome challenges and take ownership for business solutions
- Commitment to continuous personal and professional development
- Comfortable and confident interacting with people from technical and non-technical backgrounds.
- Presents data and conclusions in a truthful and appropriate manner
- Participates and shares best practice in their organisation, and the wider community around all aspects of AI data science
- Maintains awareness of trends and innovations in the subject area, utilising a range of academic literature, online sources, community interaction, conference attendance and other methods which can deliver business value

The designated mentor will support the employer and apprentice throughout the programme as a single point of contact for questions and queries. This includes additional support for portfolio and project preparation, along with any advice and guidance needed.

Included Additional Teaching:

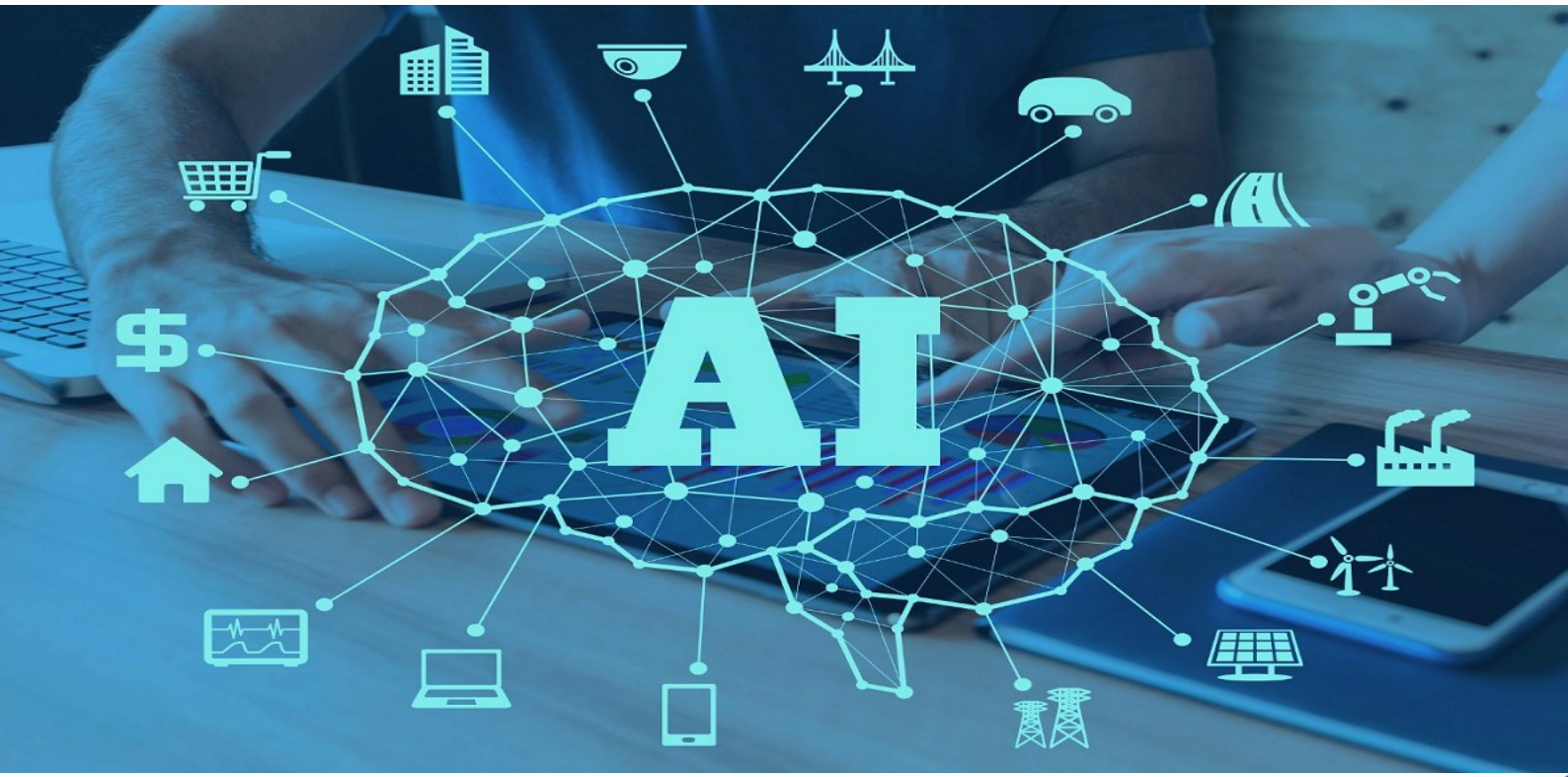
To help apprentices perform in industry, we have developed the curriculum to include the following teaching:

- Data storage (SQL, NoSQL, Data Lakes, Clouds)
- Big Data processing and optimisation techniques (NLTK, Sci-kit-image, Apache Spark)
- Data Science Toolbox (Python, Numpy, Pandas, Scikit-Learn)
- Machine Learning (supervised, unsupervised, semi -supervised)
- Deep Neural Networks (PyTorch, Jax)
- Data Product Management

Next steps:

To configure an ideal apprenticeship we will meet with you virtually to discuss your requirements, present the options and collaborate to determine the best apprenticeships to meet your needs. We will provide ongoing support including:

- Recruitment of apprentices
- Quality-assured Information, Advice and Guidance
- Updates and information on legislation and funding
- Support and guidance for apprentice and employer throughout the apprenticeship
- Access to a comprehensive suite of resources and support material
- Industry specialist qualified trainers and mentors



If you have any questions about this apprenticeship Standard or would like to book an information session, please contact our team T. 0330 380 0249 or E. info@theatp.co.uk