Registered Technician in Artificial Intelligence (RTechAI)

Code: IST25PA10

Location: In-person or online

Duration: Three days onsite • 12 online sessions

Level: FHEQ Level 5

Prerequisites: Demonstrates understanding of RTechAI requirements and can provide examples of some competencies

Description: This course is designed for people wishing to gain the IST's RTechAI professional accreditation. The course covers the main elements of the RTech AI accreditation. Participants will be mentored to complete the application form during the course.

Trainer: The course lead is Dr Marie Oldfield. Dr Oldfield is CEO of Oldfield Consultancy and the AI Lead at the Institute of Science and Technology. Dr Oldfield is also a Senior Lecturer in Practice at the LSE. Dr Oldfield is a Fellow and Chartered Statistician (CStat) of the Royal Statistical Society; a Science Council Chartered Scientist (CSci); and a Fellow (FIScT) and Advanced Practitioner in Artificial Intelligence (APAI) of the Institute of Science and Technology.

Registered Practitioner in Artificial Intelligence (RPAI)

Code: IST25PA20

Location: In-person or online

Duration: Three days onsite • 12 online sessions

Level: FHEQ Level 6

Prerequisites: RTechAI qualification or demonstrates understanding of RPAI requirements and can provide examples of some competencies

Description: This course is designed for people wishing to gain the IST's RPAI professional accreditation.

Trainer: The course lead is Dr Marie Oldfield. Dr Oldfield is CEO of Oldfield Consultancy and the AI Lead at the Institute of Science and Technology. Dr Oldfield is also a Senior Lecturer in Practice at the LSE. Dr Oldfield is a Fellow and Chartered Statistician (CStat) of the Royal Statistical Society; a Science Council Chartered Scientist (CSci); and a Fellow (FIScT) and Advanced Practitioner in Artificial Intelligence (APAI) of the Institute of Science and Technology.

Advanced Practitioner in Artificial Intelligence (APAI)

Code: IST25SD10

Location: In-person or online

Duration: Two days onsite • 8 online sessions

Level: FHEQ Level 7

Prerequisites: APAI accreditation.

Description: This course is designed for people who have achieved the IST's highest level of AI professional accreditation, APAI. It is designed to enhance knowledge and skills.

Trainer: The course lead is Dr Marie Oldfield. Dr Oldfield is CEO of Oldfield Consultancy and the AI Lead at the Institute of Science and Technology. Dr Oldfield is also a Senior Lecturer in Practice at the LSE. Dr Oldfield is a Fellow and Chartered Statistician (CStat) of the

Royal Statistical Society; a Science Council Chartered Scientist (CSci); and a Fellow (FIScT) and Advanced Practitioner in Artificial Intelligence (APAI) of the Institute of Science and Technology.

Artificial Intelligence for Beginners

Code: IST25AI10
Location: In-person or online
Duration: Two days onsite • 8 online sessions
Level: None
Prerequisites: None
Description: This course is designed to introduce course participants to AI. It describes how AI is built and used, how we can be risk-aware when working with AI and how citizens can understand decisions made about them via AI. The course is delivered in a non-technical manner with discussion sessions and case studies to create a consistent language and to address participant's questions. Course attendees will learn how they live and work within the modern AI world.
Trainer: The course lead is Dr Marie Oldfield. Dr Oldfield is CEO of Oldfield Consultancy and the AI Lead at the Institute of Science and Technology. Dr Oldfield is also a Senior Lecturer in Practice at the LSE. Dr Oldfield is a Fellow and Chartered Statistician (CStat) of the Royal Statistical Society; a Science Council Chartered Scientist (CSci); and a Fellow (FIScT) and Advanced Practitioner in Artificial Intelligence (APAI) of the Institute of Science and Technology.

Introduction to Artificial Intelligence

Code: IST25TE10
Location: In-person or online
Duration: Three days onsite • 12 online sessions
Level: FHEQ Level 5
Prerequisites: Some basic knowledge of probability and statistics would be useful. Prior knowledge of interpreted languages such as R or Python would be advantageous but is not essential.
Description: This course is designed to introduce course participants to the role of machine learning in an AI context. It describes supervised and unsupervised learning methods and reviews basic regression and classification models. Model training, testing and objective assessment are key elements of this course as are, often overlooked, ethical considerations. As well as looking in detail at selected AI/ML methods, the course examines specific case studies where things have gone wrong and what steps might have been taken to avoid catastrophic results. The course covers the technical knowledge requirement for those wishing to gain the IST's RTechAI professional accreditation.
Trainer: The course lead is Dr Richard Saldanha. Dr Saldanha is a Visiting Lecturer in machine learning at Queen Mary University of London on its master's degree programme in the School of Economics and Finance, a member of the AI for Control Problems Project at The Alan Turing Institute, and a practical user of AI/ML commercially with Oxquant. Dr Saldanha holds a doctorate (DPhil) in Statistics from the University of Oxford. He is a Fellow and Chartered Statistician (CStat) of the Royal Statistical Society; a Science Council

Chartered Scientist (CSci); and a Fellow (FIScT) and Advanced Practitioner in Artificial Intelligence (APAI) of the Institute of Science and Technology.

Intermediate Concepts in Artificial Intelligence

Code: IST25TE20

Location: In-person or online

Duration: Three days onsite • 12 online sessions

Level: FHEQ Level 6

Prerequisites: This course builds upon the topics introduced by TE10. Some knowledge of probability and statistics is essential. Course participants should also be familiar with linear algebra and basic calculus. Prior knowledge of interpreted languages such as R or Python would be a definite advantage.

Description: This course is designed to introduce course participants to the essential ingredients of an AI system. It covers the role of mathematical optimization as the practical implementation of learning, common AI/ML methods such as neural networks and tree-based methods, the bias-variance trade-off, parameter estimation, model assessment and choice. The course covers the technical knowledge requirement for those wishing to gain the IST's RPAI or APAI professional accreditation.

Trainer: The course lead is Dr Richard Saldanha. Dr Saldanha is a Visiting Lecturer in machine learning at Queen Mary University of London on its master's degree programme in the School of Economics and Finance, a member of the AI for Control Problems

Project at The Alan Turing Institute, and a practical user of AI/ML commercially with Oxquant. Dr Saldanha holds a doctorate (DPhil) in Statistics from the University of Oxford. He is a Fellow and Chartered Statistician (CStat) of the Royal Statistical Society; a Science Council Chartered Scientist (CSci); and a Fellow (FIScT) and Advanced Practitioner in Artificial Intelligence (APAI) of the Institute of Science and Technology.

Large Language Models

Code: IST25TI10

Location: In-person or online

Duration: Two days onsite • 8 online sessions

Level: FHEQ Level 6

Prerequisites: Some knowledge of probability and statistics is essential. Course participants should also be familiar with linear algebra and basic calculus. Prior knowledge of Python would be a definite advantage.

Description: This course is designed to teach participants about how LLMs are put together. It starts with a simple bigram language model, showing how parameters may be estimated based on given data and the model used to generate new examples. The neutral network model is then introduced and the model extended to language generation with the aid of the attention mechanism. Whilst we do not have the resources to put together a fully-fledged LLM, the course is designed to describe all the necessary ingredients giving participants the knowledge necessary to explore online LLM code repositories.

This course aims to separate the fact from the fiction with regard to LLMs, as well as highlight often overlooked ethical considerations.

Trainer: The course lead is Dr Richard Saldanha. Dr Saldanha is a Visiting Lecturer in machine learning at Queen Mary University of London on its master's degree programme in the School of Economics and Finance, a member of the AI for Control Problems Project at The Alan Turing Institute, and a practical user of AI/ML commercially with Oxquant. Dr Saldanha holds a doctorate (DPhil) in Statistics from the University of Oxford. He is a Fellow and Chartered Statistician (CStat) of the Royal Statistical Society; a Science Council Chartered Scientist (CSci); and a Fellow (FIScT) and Advanced Practitioner in Artificial Intelligence (APAI) of the Institute of Science and Technology.

Deep Learning

Code: IST25TI20
Location: In-person or online
Duration: Two days onsite • 8 online sessions
Level: FHEQ Level 6
Prerequisites: Some knowledge of probability and statistics is essential. Course participants should also be familiar with linear algebra and basic calculus. Some prior knowledge of Python is essential.
Description: This course is designed to teach participants about deep learning models. The course covers deep learning basics including computation and training; model components and architectures;

prediction in terms of various applications and individual real-world case studies.

Trainer: The course lead is Dr Richard Saldanha. Dr Saldanha is a Visiting Lecturer in machine learning at Queen Mary University of London on its master's degree programme in the School of Economics and Finance, a member of the AI for Control Problems Project at The Alan Turing Institute, and a practical user of AI/ML commercially with Oxquant. Dr Saldanha holds a doctorate (DPhil) in Statistics from the University of Oxford. He is a Fellow and Chartered Statistician (CStat) of the Royal Statistical Society; a Science Council Chartered Scientist (CSci); and a Fellow (FIScT) and Advanced Practitioner in Artificial Intelligence (APAI) of the Institute of Science and Technology.

Data Science I

Code: IST25TI30
Location: In-person or online
Duration: Three days onsite • 12 online sessions
Level: FHEQ Level 6
Prerequisites: Some knowledge of probability and statistics is essential. Course participants should also be familiar with linear algebra and basic calculus. Prior knowledge of R would be a definite advantage.
Description: This course examines the subject of data science from basic data cleaning and manipulation; data exploration and visualization; data cleaning, standardization and normalization; common algorithms such as linear regression, logistic regression and

decision trees; and model training and evaluation. The course also looks at model deployment and important ethical considerations. The sessions are interactive interspersed with short exercises that aid learning. Recommended resources for further learning are also given throughout. The course provides a solid foundation in data science, covering essential topics and practical skills.

Trainer: The course lead is Dr Richard Saldanha. Dr Saldanha is a Visiting Lecturer in machine learning at Queen Mary University of London on its master's degree programme in the School of Economics and Finance, a member of the AI for Control Problems Project at The Alan Turing Institute, and a practical user of AI/ML commercially with Oxquant. Dr Saldanha holds a doctorate (DPhil) in Statistics from the University of Oxford. He is a Fellow and Chartered Statistician (CStat) of the Royal Statistical Society; a Science Council Chartered Scientist (CSci); and a Fellow (FIScT) and Advanced Practitioner in Artificial Intelligence (APAI) of the Institute of Science and Technology.

Data Science II

Code: IST25TI40
Location: In-person or online
Duration: Three days onsite • 12 online sessions
Level: FHEQ Level 6
Prerequisites: Some knowledge of probability and statistics is essential. Course participants should also be familiar with linear algebra and basic calculus. Some knowledge of R and/or Python or another interpreted language.

Description: This course covers deep learning and neural networks; plus advanced machine learning techniques including ensemble methods; generative adversarial networks; and reinforcement learning. The course provides advanced data science skills, covering essential topics and practical skills.

Trainer: The course lead is Dr Richard Saldanha. Dr Saldanha is a Visiting Lecturer in machine learning at Queen Mary University of London on its master's degree programme in the School of Economics and Finance, a member of the AI for Control Problems Project at The Alan Turing Institute, and a practical user of AI/ML commercially with Oxquant. Dr Saldanha holds a doctorate (DPhil) in Statistics from the University of Oxford. He is a Fellow and Chartered Statistician (CStat) of the Royal Statistical Society; a Science Council Chartered Scientist (CSci); and a Fellow (FIScT) and Advanced Practitioner in Artificial Intelligence (APAI) of the Institute of Science and Technology.

Course Codes

AI	General **AI**
PA	**P**rofessional **A**ccreditation
SD	Personal or **S**elf-**D**evelopment
TE	Core **TE**chnical
TI	**T**echnical **I**n-depth