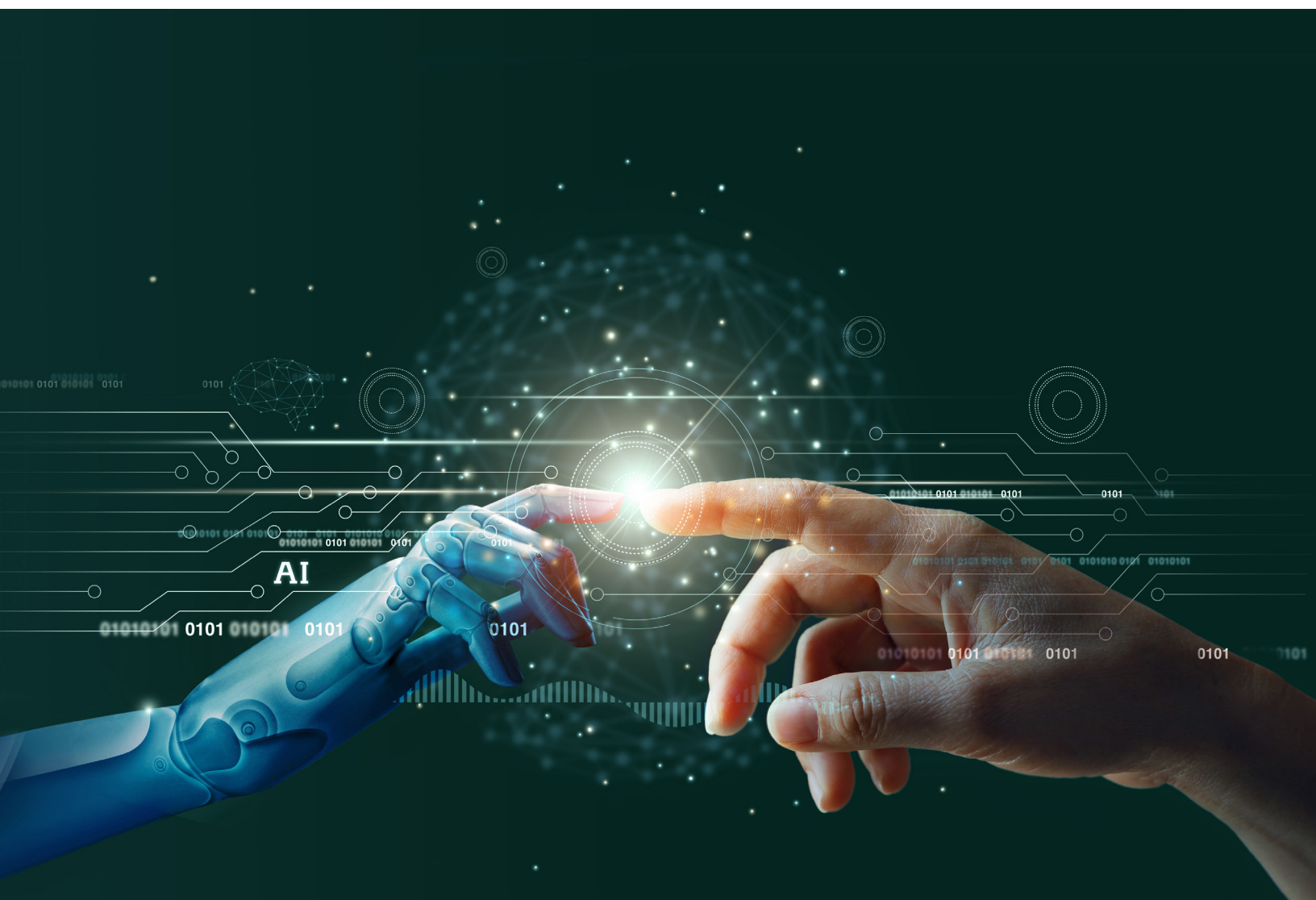


Artificial Intelligence Overview & Bootcamp



Foreword

Neuromorphic computing, robotic personal assistants, autonomous surgical robots and thought controlled gaming all might sound like they are straight out of a science fiction movie, but often yesterday's science fiction is tomorrow's science fact...

All of the above are facets of Artificial Intelligence (AI) and Artificial Intelligence is here today, amongst us, crunching algorithms at lightning pace whilst we are often unaware what is going on behind the scenes.

Chances are that one of the first things you might do on a morning is reach for your phone, using face ID to unlock it. Apple's FaceID can see in 3D, lighting up your face as it places 30,000 invisible infrared dots on it and captures the image, then using a machine learning algorithm (a subset of AI) to compare the scan of your face with what it has stored for you it can determine if the person trying to unlock the phone is you, or not. If it's not you then that's probably a bad thing, but Apple states that the chances of fooling FaceID are one in a million, so maybe not that bad after all.

Or maybe on your way to work you use Google maps, which is using AI to monitor traffic conditions, that give you real time alternatives to being sat in congestion.

All quite convenient one might say, having AI all around us, but it's not necessarily the end of the world if you need to punch in your pin to unlock your phone, or you end up being later than expected by a few minutes due to some extra traffic. Indeed it's maybe not a bad thing at all if you follow the old adage of better to arrive a bit late in this world than a bit too early in the next.

Convenience aside though, AI does open the lid on the art of the possible – and with the art of the possible, anything's possible right?

Science fiction becoming science fact.

And if anything's possible then it seems we are only just getting started. Imagine the possibilities of improving our human potential: benefits to society; healthcare; medicine. The potential to eradicate disease, poverty, hunger...

So keep imagining, and keep learning. And remember, Skills build confidence, and confidence combined with skills helps us broaden the horizons of our imaginations.



*—Richard Thomas, EMEA Sales Director,
Education Services*

AI - Contribution to society...

According to the World Economic Forum's Future of Jobs Report, more and more companies are speeding up plans to adopt AI and automation. Citing companies like OceanMind in the UK, who are using AI to fight back against over-fishing and illegal fishing that can deprive millions of livelihoods, and billions of people the food that they need.

Using data from a vast amount of sources like radar, satellite imagery or phone signals OceanMind can track thousands of vessels around the world. Analysing that data to ensure that fishing craft are only operating where they are allowed. This is only possible thanks to AI and machine learning algorithms.

Or imagine the possibilities in helping diagnose cancer.

Less than 20% of people diagnosed with cancer of the oesophagus will live beyond five years, and it is one of the six less survivable cancers. If caught early, the prognosis is encouraging – the cancer can be successfully treated in 90% of such cases. However, it is notoriously difficult to diagnose early, which contributes to the low survival rate. Clinicians at the University College London Hospital in the UK, have been working with technologists to develop a tool for the early detection of oesophageal cancers. Called CADU, [the AI-based tool analyzes images of the inside of a patient's oesophagus](#) – captured with a tiny camera lowered down a person's throat by a physician.

As many as 25% of oesophageal cancers are not detected via traditional diagnosis. But CADU has been trained with many thousands of images showing cancerous tissue and is being used to spot the subtlest of early changes in real-time, while the endoscopic camera is in use.

"All made possible with imagination, the right AI skills, data and the right infrastructure - which are some of the cornerstones of AI."

If we un-pack that statement we can learn what needs to be in place to kickstart our own AI journeys:

Infrastructure: AI needs compute and storage.

Data: Garbage in; garbage out. You need datasets to train models, data needs to be clean and you need to determine how much data you need to get useful results.

Skills: Machine Learning is a difficult subject and requires expertise, talent tends to gravitate towards those companies investing the most. Some reports indicate that 80-90% of AI talent is working at the largest technology companies in the world.

And whilst not every organization will build out a huge arsenal of AI experts, having a Data Scientist is a good start and of course Dell Education Services can help you kickstart that journey.



Building blocks for AI

The basic building blocks of AI infrastructure typically include the following components:

Data Storage: AI infrastructure requires a robust and scalable storage system to store large volumes of data. This can involve databases, data lakes, or distributed file systems that can handle structured, unstructured, and semi-structured data.

Data Processing: AI infrastructure needs the capability to process and manipulate data efficiently. This includes data preprocessing, transformation, and cleaning to ensure data quality and relevance. Distributed computing frameworks such as Apache Hadoop or Apache Spark are commonly used for large-scale data processing.

Model Development and Training: AI models are developed and trained using various algorithms and techniques. AI infrastructure provides the necessary resources, such as high-performance computing clusters or specialized hardware like GPUs (Graphics Processing Units) or TPUs (Tensor Processing Units), to train complex models efficiently.

Model Deployment and Serving: Once trained, AI models need to be deployed and made accessible for inference or prediction. This involves setting up serving infrastructure that can handle incoming requests, load balancing, and scaling to handle varying workloads. Frameworks like TensorFlow Serving or cloud-based services like AWS SageMaker can be used for model deployment.

Monitoring and Logging: It is crucial to monitor the performance and behavior of AI models and infrastructure in production. Logging and monitoring systems track metrics, detect anomalies, and provide insights into the system's health and performance. Tools like Prometheus, Grafana, or ELK (Elasticsearch, Logstash, Kibana) stack are commonly used for this purpose.

Automation and Orchestration: AI infrastructure often requires automation and orchestration tools to manage complex workflows, provisioning of resources, and scheduling of tasks. Tools like Kubernetes, Docker, or Apache Airflow can help in automating and orchestrating AI workflows and deployments.

Security and Privacy: AI infrastructure should incorporate robust security measures to protect data and models from unauthorized access or breaches. This involves implementing encryption, access controls, secure APIs, and adherence to privacy regulations to ensure data protection and compliance.

Collaboration and Version Control: In team-based AI development, collaboration and version control systems are essential for managing code, models, and experiments. Platforms like Git, GitHub, or GitLab enable collaborative development, code sharing, and version tracking.

These building blocks provide a foundation for developing, training, deploying, and maintaining AI models and systems in a scalable, reliable, and secure manner. The specific components and tools used may vary depending on the requirements and the scale of the AI infrastructure.



Dell infrastructure is a good choice for AI Infrastructure due to several reasons:

Performance and Scalability: Dell offers a wide range of high-performance computing (HPC) solutions that can handle the demanding computational requirements of AI workloads. Our servers, storage systems, and networking equipment are designed to deliver excellent performance, scalability, and throughput, which are crucial for training complex AI models.

Specialized Hardware: Dell provides access to specialized hardware, such as GPUs and TPUs, which are essential for accelerating AI computations. These hardware accelerators enable faster training and inference, allowing AI models to process large datasets more efficiently. Dell's collaborations with GPU manufacturers like NVIDIA ensure optimized integration and support for AI-specific hardware.

Customization and Flexibility: Dell offers a wide range of infrastructure solutions that can be customized to meet specific AI requirements. Our servers and storage systems can be configured to match the workload needs, whether it's a small-scale AI project or a large-scale enterprise deployment. This flexibility allows organizations to tailor the infrastructure to their specific AI workflows.

Integration with Software Ecosystem: Dell works closely with software partners to ensure seamless integration with popular AI frameworks and tools. We collaborate with leading software providers like TensorFlow, PyTorch, and Kubernetes, offering pre-validated configurations and optimized solutions for these platforms. This integration simplifies the deployment and management of AI infrastructure and ensures compatibility with widely-used AI software.

Management and Support: Dell provides comprehensive management and support services for our infrastructure solutions. This includes software management, monitoring, and automation tools that help streamline AI operations. Our support services ensure quick resolution of issues and minimize downtime, critical for maintaining a productive AI environment.

Edge Computing Capabilities: Dell offers edge computing solutions, such as ruggedized servers and edge gateways, which are well-suited for AI deployments at the network edge. Edge computing brings AI capabilities closer to the data source, reducing latency and enabling real-time AI applications in scenarios like IoT (Internet of Things) or autonomous systems.

Security and Data Protection: Dell focuses on delivering secure infrastructure solutions that adhere to industry standards and compliance regulations. We provide robust security features, including hardware-level security, encryption, and advanced threat protection, to safeguard AI models, data, and infrastructure from potential cyber threats.



Dell Education Services

At Dell Education Services we constantly see organisations looking to build on their skills, improving on their potential to propel their businesses forward.

This is, of course, what we do...

Day in, day out.

And whilst knowledge and skills drive confidence to go beyond, and accelerate our clients abilities to get the best out of their IT investments, it's true to say that knowledge alone can only get us so far.

Much like knowing how to write words doesn't entitle you to lay out volumes of Shakespearean quality, neither does writing an algorithm maketh a business a pioneer of AI.

But of course, having the right skills is without question the first step and there is nothing to say you can't start small, and careful.

And don't forget the art of the possible. Once you have the basic building blocks, the right skills, the right infrastructure, the right data, you will still need to imagine where you can take your business. Our good friend Einstein articulates this message well, for those in any doubt.



“While knowledge defines all we currently know and understand..
imagination points to all we might yet discover and create.
Imagination is more important than knowledge. Your imagination
is your preview of life's coming attractions”

—Albert Einstein

For sure though, AI is an extremely complex subject and requires significant expertise. Not only in the field itself; algorithm's such as Linear Regression, for example, are not for the feint hearted - but equally in ensuring that you have the most efficient infrastructure set-up for the job, to bring your algo's to life, in a controlled environment, is no small task either.

Dell knows data, and we know infrastructure so lean in to our expertise for the right infrastructure solutions and see our ML/OPS Managed Service offerings to get you up to speed fast.

See below also our Education courses and start making the possible real...

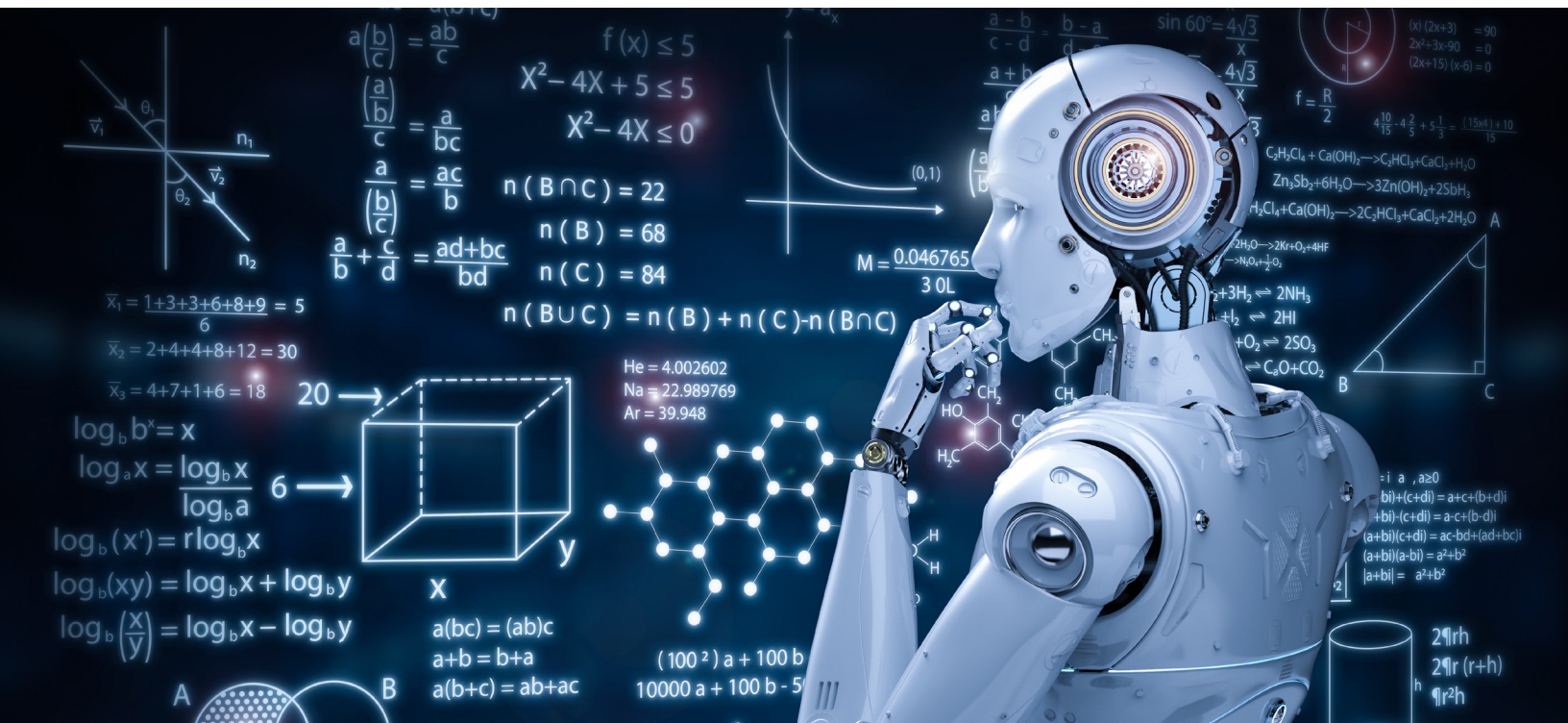
Artificial Intelligence & Machine Learning Fundamentals

Course Name	Course ID #	Delivery Mode	Duration
Open-Source Generative AI using the Dell-NVIDIA platform	Contact for Details	Private Virtual ILT	4 Days
Tech Exchange - PowerScale Artificial Intelligence and Machine Learning	ESMDXD03852	On-Demand Class	01:00 Hour



Artificial Intelligence & Machine Learning Conceptual

Course Name	Course ID #	Delivery Mode	Duration
Artificial Intelligence and Machine Learning	ESOCMD02344	On-Demand Class	16:00 Hours
AI and ML Software Frameworks	ESOCMD02260	On-Demand Class	02:45 Hours
Building an Enterprise-Wide Artificial Intelligence Infrastructure	ESOCMD02259	On-Demand Class	06:30 Hours
Implementing AI and ML in the Enterprise	ESOCMD02245	On-Demand Class	01:30 Hours
Building an AI Ecosystem	ESOCMD02262	On-Demand Class	01:30 Hours



Artificial Intelligence & Machine Learning Practical

Course Name	Course ID #	Delivery Mode	Duration
Deep Reinforcement Learning Strategies, Algorithms, and Techniques	ESOCMD02258	On-Demand Class	05:45 Hours
Machine Learning Strategies, Algorithms, and Techniques	ESOCMD02257	On-Demand Class	06:30 Hours
Data Governance, Security and Privacy for Big Data	ES732OCMDGSPR	On-Demand Class	08:00 Hours
ETL Offload with Hadoop and Spark	ES732OCMETLHS	On-Demand Class	08:00 Hours
Building Data Pipelines with Python	ES732OCMBDPPY	On-Demand Class	08:00 Hours
Data Engineering Workshop	ES722OCMDEWRK	Virtual Class	40:00 Hours
Data Science and Big Data Analytics v2	ES732OCMDSBDA	On-Demand Class	40:00 Hours
Advanced Methods in Data Science and Big Data Analytics	MR-1TP-ETAAMUSD-966	On-Demand Class	40:00 Hours

AI & Machine Learning Suite

AI for Everyday Business Users / Azure OpenAI / ChatGPT & More	
TTAI2001	QuickStart to Using Azure OpenAI Basics for Business Users (1 Day, Overview)
TTAI2002	Azure OpenAI Boot Camp for Business Users (No Coding Required!) (Light Hands-on)
TTAI2010	AI Basics for Everyday Business Camp / 1: Getting Started with AI in Business: Tools & Techniques (2 Days)
TTAI2011	AI Basics for Everyday Business Camp / 2: Transforming Business Ops with Cutting-Edge AI Apps (3 Days)
TTAI2015	QuickStart to Prompt Engineering for Everyday Business Users (1 Day)
TTAI2030	Beyond ChatGPT! AutoGPT in Action: Artificial General Intelligence (AGI) Basics for Business Users (2 Days)
AI & Machine Learning Essentials for Business	
TTML5500	Understanding AI & Machine Learning / Overview (1 day; lecture / demo)
TTML5501	Implementing AI for Business Professionals (1 day; lecture / demo)
TTML5502	Exploring AI & Machine Learning for the Enterprise / Hands-on Overview (2 days, light-hands-on)
TTAI2105	Understanding, Harnessing & Applying Generative AI for Decision Makers and Architects (1 day)
TTAI2100-B	AI for Business Innovators: Unlock the Power of Intelligent Automation (For Non-Technical Users) (2 days)
TTAI2100-H	AI for Business Innovators in Healthcare: Unlock the Power of Intelligent Automation (2 days)
TTAI2100-F	AI for Business Innovators in Finance: Unlock the Power of Intelligent Automation (2 days)
AI for Technical Users & Developers	
TTAI2003	QuickStart to Azure OpenAI Basics for Technical Users (1 day, light hands-on)
TTAI2004	Getting Started with Azure AI Boot Camp for Technical Users: Unleash the Power of AI in Your Projects (3 days)
TTAI2153	Turbocharge Your Code! Generative AI Boot Camp for Developers (3 days)
TTAI2020	QuickStart to Prompt Engineering for Software Developers (1 day)
TTAI2034	Leveraging OpenAI for Enterprise Solutions / AI Boot Camp for Business (4 days)
Applied AI / AI Technical Classes	
TTAML001	Building Intelligent Web Applications (3 days)
TTAML010	Build Chatbots! Chatbots and Conversational UI Development with Neural Networks (3 days)
TTAML012	Building Recommendation Systems with Python (3 days)
TTAI2220	Exploring AI Operations: Strategies for Testing and Deploying Intelligent Systems for Success (2 days)
TTAI2225	Implementing AI in Software Testing / AI in Test Automation (2 days)

AI & Machine Learning Suite Contd.

TTAI2300	AI for Time Series Analysis and Forecasting (3 days)
TT8170	Applying AI in Secure Web Application Development (1 day)
TT8175	Applying AI to the OWASP Top Ten (1 day)
Machine Learning Core & Programming	
TTML5503	AI / ML JumpStart introduction to AI, AI Programming & Machine Learning (3 days)
TTML5506-P	Machine Learning Essentials with Python (3 days)
TTML5506-S	Machine Learning Essentials with Scala (3 days)
TTML5507	Machine Learning Boot Camp / SkillJourney / Part 1: Data Prep (3 days or 5 half days)
TTML5508	Machine Learning Boot Camp / SkillJourney / Part 2: Deep Skills Workshop (3 days or 5 half days)
Related Programming Essentials Courses	
TTPS4800	Introduction to Python Programming Basics (3 days)
TTPS4873	Fast Track to Python for Data Science (3 days)
TTPS4879	Data Analysis using Pandas (3 days)
TTPS4876	Intermediate Python for Data Science & Machine Learning (5 days)
TTDS6683	R Programming Essentials for Data Science & Machine Learning (3 days)
TTSC2104	Fast Track to Scala Programming (4 days)
Next-Level Machine Learning & Deep Learning	
TTML5904	NLP in Action: Hands-on Natural Language Processing (3 days)
TTML6903	Exploring RPA / Robotics Process Automation (4 days)
TTDL6603	AI, Machine Learning & Deep Learning Essentials (3 days)
TTML6604	Deep Learning Deep Dive (3 days)
TTDL6904	Deep Learning with Vision Systems (3 days)
TTSK7520	Mastering Scala with Apache Spark for the Modern Data Enterprise (5 days)

Setup Made Simple! Learning Experience Platform (LXP)

All applicable course software, digital courseware files or course notes, labs, data sets and solutions, live coaching support channels and rich extended learning and post training resources are provided for you in our “easy access, no install required” online **Learning Experience Platform (LXP)**, remote lab and content environment. Access periods vary by course. We’ll collaborate with you to ensure your team is set up and ready to go well in advance of the class. Please inquire about set up details and options for your specific course of interest.



Connect with an Education Account Manager

Education Services Regional Sales Directors

Sarah Scardilli (NA)

Sarah.Scardilli@dell.com

Rich Thomas (EMEA)

Rich.Thomas@dell.com

Simone Malta (LATAM)

Simone.Malta@dell.com

Mike Rodwell (APJ)

Michael.Rodwell@gmail.com



[Learn more](#) about Dell
Education services



[Contact Education
Services Support](#)



[View more training
courses](#)



Join the conversation with
[#DellTechLearn](#)

© 2023 Dell Inc. or its subsidiaries. All Rights Reserved. Dell and other trademarks are trademarks of Dell Inc. or its subsidiaries. Other trademarks may be trademarks of their respective owners.