



Krisolis

EMPOWER / INNOVATE / EVOLVE

Your Data Journey Starts Here

And Krisolis will be with you at every
step of the way.



Vision & Mission

At Krisolis we **empower** you to **innovate** and **evolve** through every stage of your data journey.

Our mission is for our team to **become a part of your team**. Through training, mentoring and consulting our flexible approach means that we're able support you using a variety of methods, always staying focused on your objectives.



"We work alongside you and your organisation to foster a culture of innovation and excellence using the latest tools in data science and AI"

Aoife D'Arcy
Krisolis CEO

About Krisolis

Rather than simply providing standard training courses in data science and AI, we combine our skills as leading analytics experts with a sharp focus on our clients to deliver what they need.

We work hard to understand your business, where it has come from and where it's going. Our experience as both **practitioners and academics** means we're uniquely positioned to **partner with you to achieve your learning objectives** by coaching and supporting individuals, teams, departments and the entire organisation.

What we offer

- ✓ Customised Training Programmes
- ✓ Mentorship Programmes
- ✓ Consultancy
- ✓ Strategy Development

The Krisolis Approach to Learning

Each of our training courses and programmes considers three core elements: **Theory, Tools and Application**.

Each are approached separately and blended in a way that means **learnings can be confidently applied once back in the workplace**, and easily transferred as technologies change.



Choose from or combine

- ✓ Classroom-based Learning
- ✓ Facilitated Workshops
- ✓ Coaching and Mentoring
- ✓ Face to Face or Online Support

Academies and Accredited Programmes

Our **academies and accredited programmes** are designed to support your organisation through its Data and AI journey.

Our delivery can **range between 4 and 16 weeks**, depending on which programme you choose, so it provides a substantial opportunity to address your team's critical learning needs, develop skills and close knowledge gaps, **all delivered by our expert team and faculty**.

Customised Training and Learning Paths

Our customised learning paths are **flexible learning programmes** that are **tailored to your needs** and utilise a **range of learning approaches** to ensure we always stay focused on the objectives of your teams and organisation.

Standard Training Courses and Workshops

Each of our courses is designed to work as a standalone piece of **learning or can be combined** with multiple courses, facilitated workshops, mentoring and coaching and other learning-beyond-the-classroom initiatives to ensure engaging and rewarding learning paths.

Adoption

One of the central principles of our training programmes is ensuring that skills and knowledge learned with us are **applied effectively within your business.**

To ensure this we offer a variety of courses for **business leaders, programme managers and decision makers** that ensure that data solutions created by more technical teams can be **easily adopted across the organisation.**

Topics covered include:

- Artificial Intelligence (AI) and its applications
- How to get the best from your data
- How to embed effective work practices to allow your team to work well together

Fundamentals

Our Fundamentals courses demonstrate how you can **put this generation's most powerful business tools to work for you.**

Topics covered include:

- Effective Data Visualisation
- Business Analytics
- Introduction to Programming with R / Python / SQL
- Data Tools and their Applications
- Data Preparation and Pre-Processing

Standard Training Courses and Workshops

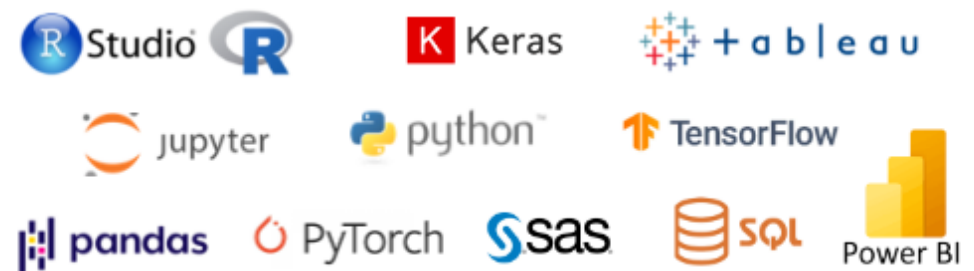
Advanced

Our Advanced courses are designed to help you and your team **evolve your existing data, machine learning and artificial intelligence skills** using the most up to date and advanced tools available.

Topics covered include:

- Deep Learning
- Machine Learning
- Generative AI
- Big Data
- Time Series Analysis
- Natural Language Processing
- Network Analytics
- Anomaly Detection
- Reinforcement Learning

Technologies We Use:



All of our course material can be **customised** to best suit your training needs and to ensure **engaging and rewarding** learning paths.

Mathematical Foundations of AI

Advanced Course

Two Day Course

What will I learn?

- ✓ Select appropriate statistical and probability techniques for analysing data.
- ✓ Understand the fundamentals of algebra and how it applies to the area of Artificial Intelligence.
- ✓ Understand the fundamentals of calculus and how it applies to the area of Artificial Intelligence.
- ✓ Understand the importance of algorithmic thinking and how it applies in Artificial Intelligence.

Overview

Artificial Intelligence as a discipline has evolved significantly in recent times and is moving more and more into the mainstream. Organisations are increasingly using robots, machine learning and other AI based technologies to enhance their processes, performance and outcomes.

The field is continuously growing in importance, and this course introduces the underlying mathematical foundations that underpin decision making and Artificial Intelligence such as Statistics, Probability, Linear Algebra and Basic Calculus. They will also explore what algorithmic thinking is and how it applies in Artificial Intelligence.

Is this course for me?

This course has been specifically designed for those with an interest in, and aptitude for, transitioning into the field of Artificial Intelligence but who do not necessarily have a background in Artificial Intelligence or a related area.

✉ To find out more about this course send us an email at info@krisolis.ie

Fundamentals of Machine Learning using Python

Advanced Course

Three Day Course

What will I learn?

- ✓ Understand the fundamental ideas behind ML, and the most important ML approaches.
- ✓ Learn how to frame ML solutions to business problems.
- ✓ Understand how to correctly evaluate ML models.
- ✓ Understand and use supervised learning algorithms (including Information-based and Error-based learning) and unsupervised learning algorithms (such as clustering).
- ✓ Master the use of Python (especially the sklearn package) to build predictive models (supervised learning) and perform unsupervised learning.

Overview

Machine Learning (ML) – the main driver of Artificial Intelligence - has advanced significantly in recent times and is moving more and more into the mainstream. Companies are increasingly using robots, predictive models, and other ML-based technologies to enhance their business processes, performance, and outcomes.

This course guides participants through the most important techniques in ML (supervised learning and unsupervised learning) and how they should be applied to build real-world relevant models. This course covers both fundamental concepts and practical applications in Python.

This course has been designed to guide you through the most important topics in designing, building and evaluating machine learning solutions, and how they should be applied to real-world scenarios.

Is this course for me?

This course is aimed at people who would like to use supervised and unsupervised ML techniques to make a difference within their organisation. The course assumes delegates already know how to program in Python and is ideally suited to people working in data analyst, data science, business analyst, statistician, or similar roles wishing to add predictive analytics and ML skills to their repertoire.

✉ To find out more about this course send us an email at info@krisolis.ie

Fundamentals of Machine Learning using R

Advanced Course

Three Day Course

What will I learn?

- ✓ Understand the fundamental ideas behind ML, and the most important ML approaches.
- ✓ Learn how to frame ML solutions to business problems.
- ✓ Understand how to correctly evaluate ML models.
- ✓ Understand and use supervised learning algorithms (including Information-based and Error-based learning) and unsupervised learning algorithms (such as clustering).
- ✓ Master the use of R (especially the tidymodels package) to build predictive models (supervised learning) and perform unsupervised learning.

Overview

Machine Learning (ML) – the main driver of Artificial Intelligence - has advanced significantly in recent times and is moving more and more into the mainstream. Companies are increasingly using robots, predictive models, and other ML-based technologies to enhance their business processes, performance, and outcomes.

This course guides participants through the most important techniques in ML (supervised learning and unsupervised learning) and how they should be applied to build real-world relevant models. This course covers both fundamental concepts and practical applications in R.

This course has been designed to guide you through the most important topics in designing, building and evaluating machine learning solutions, and how they should be applied to real-world scenarios.

Is this course for me?

This course assumes delegates already know how to program in R and is aimed at people who would like to use supervised and unsupervised ML techniques to make a difference within their organisation. The course is ideally suited to people working in data analyst, data science, business analyst, statistician, or similar roles wishing to add predictive analytics and ML skills to their repertoire.

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Data Preparation and Exploration for Machine Learning

Advanced Course

Two Day Course

What will I learn?

- ✓ Understand the fundamental theories of machine learning, and the most important machine learning approaches.
- ✓ Be familiar with designing data structures for machine learning as well as introducing a wide range of data exploration techniques and how to apply them.
- ✓ Be comfortable analysing the quality of data and validating datasets.
- ✓ Be comfortable preparing data for machine learning including data aggregations, joining data, filtering, and deriving new features.
- ✓ Understand and apply the core data pre-processing approaches for machine learning, such as data sampling, imputations and data transformations.

Overview

It is well known that the first steps in any data science project are to retrieve data from disparate data sources, bring it together into one analytically ready data source and initial exploratory analysis. Often the technical skills are known to complete these tasks, but it can be difficult to know how to apply these skills effectively. Sometimes the struggle is to match your data to the business problems you are trying to solve and to structure the data correctly for the type of analysis you want to do.

This course uses examples from clustering and prediction to time series forecasting to demystify the process of transforming raw data into insight-filled data ready for driving your analytics solutions. This course has been designed to guide participants through the most important topics in designing and building analytics and machine learning solutions, and how they should be applied to real-world scenarios. This course can be delivered using Python, R, or SAS.

Is this course for me?

This course is targeted at participants who are familiar with analytics techniques and are involved in deploying analytics solutions in their organisations. This course assumes delegates are already comfortable with the technology being used (e.g. Python, R or SAS).

✉ To find out more about this course send us an email at info@krisolis.ie

Advanced Machine Learning

Advanced Course

Three Day Course

What will I learn?

- ✓ Understand and use the most important algorithms in unsupervised machine learning for clustering and representation learning.
- ✓ Apply advanced supervised machine learning techniques to build more powerful models.
- ✓ Understand how deep learning differs from other machine learning techniques and how it can be used in image processing and text applications.
- ✓ Understand and use semi-supervised machine learning to maximise the use of labelled and unlabelled data.
- ✓ Deploy and evaluate machine learning solutions for effective use.

Overview

Machine learning algorithms extract patterns from large datasets to build predictive data analytics models. The breadth of techniques for machine learning and the areas to which they are being applied is growing at a blistering pace.

This course has been designed as a follow-on to the Fundamentals of Machine Learning course, to progress to more advanced topics. This covers supervised learning techniques as well as unsupervised and semi-supervised learning. Again, we will explore both theoretical concepts and practical applications of these methods. This course can be delivered using Python, R, or SAS.

Is this course for me?

This course is aimed at AI professionals seeking to further their existing skills with an intensive, demonstration-led, introduction to advanced machine learning techniques. This course assumes delegates are already comfortable with the technology being used (e.g. Python, R or SAS).

✉ To find out more about this course send us an email at info@krisolis.ie

Deep Learning

Advanced Course

One Day Course

What will I learn?

- ✓ Frame business problems as deep learning problems and solve them using appropriate techniques.
- ✓ Understand the basic structure of artificial neural networks, as well as gradient descent and the back-propagation of error algorithm.
- ✓ Appreciate the complications involved in building deep neural networks.
- ✓ Understand how to apply appropriate deep learning techniques (e.g. transformer models) to text understanding problems (e.g. classification, translation, m and generation).
- ✓ Understand how to apply appropriate deep learning techniques (e.g. recurrent neural networks) to text understanding problems (e.g. classification and translation).

Overview

Recent developments in machine learning approaches, collectively referred to as deep learning, are responsible for the large performance gains made in the last decade in tasks such as voice recognition, image and video classification, and forecasting.

Deep learning refers to a relatively recent set of generative machine learning techniques that autonomously generate high-level representations from raw data sources, and use these representations to perform machine learning tasks such as classification, regression, and clustering.

Through real world examples, discussions, and live code demonstrations this one-day workshop designed for AI professionals introduces the most important deep learning techniques for supervised and unsupervised machine learning tasks.

This workshop has been designed to equip participants with the most important deep learning techniques, and an understanding of how they should be applied to build real-world relevant solutions.

Is this course for me?

This course is aimed at AI professionals seeking to further their existing skills with an intensive, demonstration-led, introduction to Deep Learning.

✉ To find out more about this course send us an email at info@krisolis.ie

Fundamentals of Generative AI

Advanced Course

Three Day Course

What will I learn?

- ✓ Understand the fundamental ideas behind Generative AI, and the importance of its application in the modern AI landscape. Understand how to frame applications of Generative AI to business problems.
- ✓ Understand how Generative AI can be used to generate text for several applications, including question answering tasks, and the underlying processes behind these.
- ✓ Have gained the practical skills to apply pre-trained LLMs, alongside a custom dataset, to build a Retrieval Augmented Generation (RAG) powered chatbot for querying this custom data source.
- ✓ Understand how Generative AI can be used to generate content from other media including images and audio, and the underlying processes behind these.
- ✓ Understand how to make Generative AI models work for you, with topics including fine tuning existing pretrained models, and how Generative AI can be integrated into daily business processes.

Overview

Generative AI is a rapidly growing subfield of Machine Learning, with the potential to unlock and leverage many untapped business-use cases. Generative AI techniques allow us to generate content such as images, text, audio, and video automatically. Practical applications of Generative AI include leveraging existing Large Language Models (LLMs) to build chatbots for querying internal data stores, and the generation of new images and artwork based on user text prompts.

This course has been designed to guide participants through the most important topics in Generative AI, and how they can be applied to build real-world relevant solutions. This course covers current Generative AI approaches, discussing both theoretical concepts and practical applications in Python.

Is this course for me?

This course is aimed at people who would like to gain a thorough understanding of the processes involved in building Generative AI solutions. This course is ideally suited to people who are already working in roles that require fundamental Machine Learning and Deep Learning skills*, who wish to add Generative AI techniques to their repertoire. It is assumed that learners have previously worked with and are familiar with the Python programming language, and associated ML and DL Python packages.

* Please note that an additional course covering the fundamentals of Machine Learning and the fundamentals of Deep Learning can also be provided to delegates as a primer for this course.

✉ To find out more about this course send us an email at info@krisolis.ie

Time Series Analysis

Advanced Course

Two Day Course

What will I learn?

- ✓ Understand the fundamentals of time series forecasting and how ARIMA models can be used for this.
- ✓ Understand how time-series-specific machine learning techniques can be used for clustering, classification, and forecasting.
- ✓ Be able to fit SLR, Exponential Smoothing and ARIMAX models to time series data.
- ✓ Be able to accommodate trend, as well as seasonal and event-related variation, in time series models.
- ✓ Be able to interpret and evaluate time series models as well as be able to identify relative strengths and weaknesses of the model types.

Overview

Time series data arises in applications from finance to personal activity monitoring and has unique characteristics that demand the use of specialised techniques.

The course covers the fundamentals of modelling time series data and focuses on the application of the main model types used to analyse univariate time series: simple linear regression, exponential smoothing and autoregressive integrated moving average with exogenous variables (ARIMAX).

Machine learning approaches can also be applied to high-volume, high-velocity time series data. This course introduces how the most important of these can be used for clustering, classification, and forecasting tasks.

Is this course for me?

This course is aimed at data professionals seeking to further their existing skills with an intensive, demonstration-led, introduction to working with time series data.

✉ To find out more about this course send us an email at info@krisolis.ie

Reinforcement Learning

Advanced Course

One Day Course

What will I learn?

- ✓ Understand the key ideas in reinforcement learning including *agents*, *state*, *reward*, and *value*.
- ✓ Frame solutions to problems as applications of reinforcement learning.
- ✓ Understand the most important reinforcement learning algorithms and how deep learning is combined with reinforcement learning in deep reinforcement learning.
- ✓ Use a reinforcement learning API to develop solutions based on reinforcement learning.
- ✓ Design deployment and evaluation strategies for reinforcement learning.

Overview

Reinforcement learning is a machine learning approach that, in contrast to supervised learning, learns from rewards earned during experience at a task rather than from a labelled dataset. Early applications of reinforcement learning focused on control applications in robotics and game playing. Reinforcement learning has, however, seen recent renewed interest and application to a broader set of domains including finance, health, and online recommender systems.

This course is a one-day masterclass that provides an accelerated introduction to the key ideas in reinforcement learning and demonstrates applications through a specific reinforcement learning API, for example Stable-Baselines3 or TensorFlow Agents.

Is this course for me?

This course is most relevant to people who are working with machine learning tools and who are competent programmers who would like to add reinforcement learning to their toolbox for solving problems. This course is ideally suited to people working in data science roles.

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Natural Language Processing

Advanced Course

Three Day Course

What will I learn?

- ✓ Understand the potential AI solutions that can be built by utilising text data and natural language processing and the problems that they solve.
- ✓ Understand the structure of text corpora and the challenges in working with different types of text including long and short text; formal and informal text; and structured, semi-structured and unstructured text.
- ✓ Perform exploratory analysis of text collections using tokenisation, concordances, n-gram frequency counting, regular expressions, sentiment analysis, and key-word and key-phrase extraction.
- ✓ Apply core NLP techniques (including part of speech tagging, syntax parsing, language modelling and chunking) to extract features from text documents and text collections for use in machine learning models.
- ✓ Generate and utilise word embeddings from texts and use pre-trained text embeddings from large language models.

Overview

Much of the data we collect today is not stored in structured data tables, but rather in the unstructured text we collect and generate in our daily lives. From medical reports and business memos to social media posts and emails we collectively generate billions of words of text data every day. If we fail to unlock the insights contained in this data we are missing a massive opportunity.

This course focuses on applying natural language processing tools and techniques to extract insights from large collections of text data. It has been designed to guide participants through the most important topics in NLP, and how they should be applied to build real-world-relevant solutions.

Is this course for me?

This course is relevant to people who are working with machine learning tools who would like to harness the potential of unstructured text data as well as structured tabular data within their organisations. This course is ideally suited to people working in data analyst, data science, business analyst, statistician, or similar roles.

✉ To find out more about this course send us an email at info@krisolis.ie

Anomaly Detection

Advanced Course

Two Day Course

What will I learn?

- ✓ Frame a wide range of issues as anomaly detection problems and determine the appropriate techniques and patterns to use to solve to them.
- ✓ Apply appropriate techniques to perform univariate outlier detection.
- ✓ Select and apply appropriate techniques for detecting anomalies in time series data.
- ✓ Perform anomaly detection in multivariate data using machine learning techniques.
- ✓ Design and implement solutions for anomaly detection in datasets of specific formats such as graph data or transactional data.

Overview

While many machine learning tasks, such as propensity modelling, have become standardised to the point of near automation, detecting anomalies in large complex datasets remains a fundamental challenge often requiring bespoke, creative solutions. There are, however, a core set of techniques and design patterns that can be built upon for anomaly detection problems in domains such as fraud detection, risk identification, and classification of rare events.

Through presentations, real world examples, discussions, and workshops this course introduces the most important of these. This course has been designed to equip participants with the most important anomaly detection techniques and design patterns, and an understanding of how they should be applied to build real-world relevant solutions.

Is this course for me?

This course is aimed at people who are familiar with the use of machine learning techniques for standard tasks like classification and forecasting, that would like to expand their repertoire with other techniques that can be used for less standard anomaly detection problems. This course is ideally suited to people working in data analyst, data science, business analyst, statistician, or similar roles wishing to add anomaly detection skills to their repertoire.

✉ To find out more about this course send us an email at info@krisolis.ie

Network Analytics

What will I learn?

- ✓ Frame a wide range of problems as network analytics problems and solve them using appropriate techniques.
- ✓ Understand the structure and characteristics of networks and perform basic network analysis using measures of degree, density, centrality, etc.
- ✓ Visualise networks using appropriate tools and techniques.
- ✓ Perform classification tasks on networks using appropriate node featurisation techniques, perform anomaly detection to identify unusual patterns in networks, and apply community finding to discover group structures in networks.
- ✓ Understand the characteristics of bipartite and multipartite networks, as well as dynamic networks, and how they impact network analysis.

Advanced Course

Two Day Course

Overview

Analysing networks is not a new topic, but the digitisation of so many daily business, organisational, and personal activities as well as the migration of so much communication to online platforms makes analysis of data networks more important now than ever before. This course is designed to cover the most important network analytics techniques that can be used in broad data analytics applications.

This course has been designed to guide participants through the most important topics in network analytics, and how they should be applied to build real-world relevant solutions.

Is this course for me?

This course is aimed at people who would like to expand their data analytics skills to include handling network data to open up solutions that are available when problems are framed in terms of networks. This course is ideally suited to people working in data analyst, data science, business analyst, statistician, or similar roles.

✉ To find out more about this course send us an email at info@krisolis.ie

Big Data Programming

Advanced Course

Two Day Course

What will I learn?

- ✓ Understand the problem of managing data at scale and why traditional data management systems are failing.
- ✓ Understand the various data management paradigms used in the context of Big Data.
- ✓ Understand the role of distributed file systems and how to manage your own cluster.
- ✓ Understand Big Data programming models such as Map/Reduce and Spark, and how to use them on real examples.
- ✓ Understand how to process big data streams.

Overview

Processing high-volume and high-velocity datasets remains a challenge for conventional data processing platforms and requires specific tools and technologies beyond the standard data analytics stack.

This course introduces the key tools and architectures that are used to manage and process high volume and high velocity datasets. Tools and architectures that will be explored include Apache Hadoop, Apache Spark and more. This course will equip participants to build modern big data solutions to solve real-world problems.

After completing this course participants will understand modern big data tools and architectures and be able to use them to build solutions that leverage massive data resources and are deployed at scale.

Is this course for me?

Programmers with existing data analytics expertise who want to leverage modern big data technologies to build solutions that scale.

✉ To find out more about this course send us an email at info@krisolis.ie

Semi-Supervised Learning

Advanced Course

One Day Course

What will I learn?

- ✓ Understand the distinctions between semi-supervised, supervised and unsupervised machine learning.
- ✓ Apply semi-supervised learning techniques including pseudo-labelling, co-training, and active learning.
- ✓ Evaluate semi-supervised machine learning systems.

Overview

For many data analytics scenarios, while data is freely available, labelled data can be very scarce and expensive to collect. Semi-supervised machine learning algorithms couple small amounts of labelled data with large amounts of unlabelled data to build predictive models.

This course will explore the most important semi-supervised machine learning techniques and explore their applications and practical considerations for using them.

Is this course for me?

Attendees should be familiar with basic supervised and unsupervised machine learning methods, and comfortable with these methods using appropriate machine learning technology.

✉ To find out more about this course send us an email at info@krisolis.ie

Contact Krisolis

To discuss your team's skills development, and how to make the best use of our training, mentoring and consultancy services please contact us using the following:

✉ info@krisolis.ie

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